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Transportation

PREPARING HAZARDOUS MATERIALS FOR MILITARY AIR SHIPMENTS

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This manual implements AFPD 24-2, *Preparation and Movement of Air Force Materiel*. This directive applies to all service members, civilians, Air Reserve Command, Air National Guard, Defense Agencies, and contract personnel. For military members, failure to obey the mandatory provisions of **paragraphs A5.2** through **A5.27**, **A6.2** through **A6.25**; **A7.2** through **A7.9**; **A8.2** through **A8.21**; **A9.3** through **A9.10**; **A10.2** through **A10.10**; **A11.2** through **A11.12**; **A12.2** through **A12.14**; **A13.2** through **A13.20**; **A18.2** and **A18.4** and any provisions of mandatory subparagraph(s) thereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the mandatory provisions of **paragraphs A5.2** through **A5.27**; **A6.2** through **A6.25**; **A7.2** through **A7.9**; **A8.2** through **A8.21**; **A9.3** through **A9.10**; **A10.2** through **A10.10**; **A11.2** through **A11.12**; **A12.2** through **A12.14**; **A13.2** through **A13.20**; **A18.2** and **A18.4** and any provisions of mandatory subparagraph(s) thereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel must not deviate from any of these provisions and shall select the precise containers listed in each packaging paragraph or subparagraph. Not all packaging paragraphs are inclusive and packaging is based on the class of the hazardous cargo. See **Attachment 1** for terms, abbreviations, and acronyms used in this manual. This publication does not apply to the Civil Air Patrol (CAP). It provides guidance and procedures for preparing hazardous materials for shipment by military aircraft to ensure that such materials are packaged, marked, labeled, and prepared properly for transportation. This manual includes the shipment of nuclear materials, except for nuclear weapon major assemblies and nuclear components packaged and shipped per Department of Energy-Defense Nuclear Agency (DOE-DNA) TP 45-

51 and its supplements. It includes labeling requirements, instructions for transporting passengers with hazardous materials and instructions for notifying the aircraft commander regarding hazardous materials on the aircraft. It implements Defense Transportation Regulation (DTR) 4500.9-R, *Defense Transportation Regulation* and Department of Transportation (DOT) Special Permits 7573 and 9232 (DOT-SP 7573 and DOT-SP 9232) for commercial aircraft under contract to the Air Mobility Command (AMC). The use of a name of any specific manufacturer, commercial product, commodity or service in this publication does not imply endorsement by the military services. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at **https://www.my.af.mil/afrims/afrims/afrims/rims.cfm**. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR), using the AF FORM 847, *Recommendation for Change of Publication*; route AF FORM 847s from the field through the appropriate functional's chain of command.

SUMMARY OF CHANGES

This revision incorporates applicable changes to the Department of Transportation (DOT) Title 49 Code of Federal Regulations (CFR) and the International Civil Aviation Organization (ICAO) Technical Instructions. This revision amends policy statements (**Chapter 1**-**Chapter 3**), general packaging, hazard classification and communication information (**Attachment 3**- **Attachment 4**), and packaging requirements (**Attachment 5**- **Attachment 13**), and certification requirements (**Attachment 17**). This manual integrates existing/new packagings paragraphs and reorganizes text to comply with Air Force Manual format and changes many procedures. These changes clarify requirements and further standardize DOD packaging and shipping with the commercial sector.

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Chapter 1

GENERAL GUIDANCE

1.1. Applicability. Handlers, packers, inspectors, and preparers (certifiers) of hazardous materials shall comply with rules designed to maximize safety and security of the aircraft, aircrew, cargo and passengers. They must know the exceptions, special permits, and waivers to federal laws and related government directives that are unique to military airlift operations and how to apply them.

1.1.1. This manual governs the transport of hazardous material when entered into the Defense Transportation System (DTS) as cargo on military controlled fixed and rotary wing aircraft according to DTR 4500.9-R. Apply the requirements specified in this manual unless modified or updated according to **paragraph 1.2.1**.

1.1.2. Hazardous materials required as operational equipment of the aircraft for ground/air servicing as identified in applicable aircraft flight publications are not regulated by this manual. Use the provisions of this manual to the greatest extent possible to ensure safety of the aircraft, aircrew, and passengers.

1.1.3. The provisions of this manual are directive in nature, and must be complied with by those personnel whose positions or jobs entail responsibility for the functions covered.

1.1.4. Ensure compliance with current applicable DOT and EPA requirements when transporting hazardous materials outside of the Defense Transportation System. Hazardous waste shipments entering or exiting a domestic location must comply with 40 CFR Parts 260-265, including preparation of a hazardous waste manifest. Hazardous waste shipments originating and terminating at Outside the Continental United States (OCONUS) locations must comply with applicable local and national regulations as appropriate. If local or national regulations do not exist, comply with 40 CFR Parts 260-265.

1.2. Responsibilities Assigned.

1.2.1. Office of Primary Responsibility (OPR) will publish emergency changes of an operational or technical nature that do not change policies or major procedures without service coordination. Coordinate all policy changes with Service focal points. Issue hazardous cargo information, clarifications, updates, procedural and policy changes to Air Force activities and Service focal points. Focal points retransmit changes to their respective service or agency shippers.

1.2.2. Service Focal Points jointly establish procedures and prepare any documentation necessary to implement this manual. Users contact their Service focal points for all clarifications and waivers. Service focal points are:

1.2.2.1. Air Force. Air Force Global Logistics Support Center (AFGLSC) 401st Supply Chain Management Squadron (401 SCMS/GUMA), 5375 Chidlaw Rd, Wright-Patterson AFB, OH 45433-5540, (937) 257-4503/1984, DSN: 787-4503/1984.

1.2.2.2. Army. US Army Material Command, Logistics Support Activity, Packaging, Storage, and Containerization Center, ATTN: AMXLS-AT, 11 Hap Arnold Blvd, Tobyhanna PA 18466-5097, (570) 895-7070/6408, DSN: 795-7070/6408.

1.2.2.3. Navy. Commander, Naval Inventory Control Point, Code 0772.19, P.O. Box 2020, 5450 Carlisle Pike, Mechanicsburg, PA 17055-0788, (717) 605-4527, DSN: 430-4527.

1.2.2.4. Marine Corps. Commandant of the Marine Corps (LPD), Headquarters, U.S. Marine Corps, 3000 Marine Corps Pentagon, Washington, DC 20350, (703) 695-7930, DSN: 225-7930.

1.2.2.5. Defense Logistics Agency. Defense Logistics Agency, Attn: J3731, 8725 John J. Kingman Road, Suite 4330, Fort Belvoir VA 22060-6221, (703) 767-6582, DSN: 427-6582.

1.2.3. Packers package hazardous materials, but do not sign legally binding documents.

1.2.4. Preparers certify that hazardous materials are properly classified, described, packaged, marked and labeled, and in proper condition for military airlift according to the applicable regulations of the Department of Transportation and this manual. Preparers include Technical Specialists. These individuals are qualified based on their training in handling and preparing the hazardous material in the performance of their duties.

1.2.5. Handlers maintain safe operations when transporting hazardous materials and proficiency in job specific responsibilities. Handlers include warehouse workers, aircraft load teams, pallet build-up personnel, and other individuals who routinely come into contact with hazardous materials but do not package, inspect, or certify.

1.2.6. Inspectors ensure hazardous materials are properly prepared and documented before entering into the military airlift system (see **Attachment 28**).

1.2.7. Installation or Activity Commanders (or their designated representatives).

1.2.7.1. Train personnel according to **paragraph 1.3**.

1.2.7.2. Appoint preparers as certifying officials to complete the Shipper's Declaration for Dangerous Goods Certification. This authorization must include the scope of the individual's authority and qualified training according to **Attachment 25**. Document the authorization in writing, electronically, or other auditable method.

1.2.8. The requiring activity shall inform the Contracting Officer when the requirement includes hazardous materials so that the appropriate clauses are included in the resultant contract(s).

1.2.9. Air terminal or base operations personnel. Notify the aircraft commander (or designated representative), in writing, of all hazardous materials aboard the aircraft. The activity responsible for delivering the cargo to the aircraft provides this notification in the absence of an established air terminal or base operation. The briefing agency must meet the requirements of **Attachment 21**.

1.3. Hazardous Material Training Requirements. Commanders assign hazardous material workers and ensure each successfully completes relevant training. Train hazardous material workers according to **Attachment 25**. Training for all levels of hazardous material workers who may affect the safety and security of hazardous materials in transportation, as a minimum, must address the following areas:

1.3.1. Hazardous material general awareness and familiarization.

1.3.2. Safety procedures to include emergency response.

1.3.3. Function specific responsibilities directly relevant to the individual's role in hazardous material transportation.

1.3.4. Security awareness.

1.4. Special Assignment Airlift Missions (SAAM). Process SAAM requests, cargo clearance, and appropriate confirmations according to DTR 4500.9-R. Unless specifically exempted under the provisions of **paragraph 2.3**, properly prepare, package, mark, label, and document all hazardous materials transported by SAAM aircraft according to this manual. Do not automatically apply the provisions of **Chapter 3** for use of SAAM aircraft. Refer to **paragraphs 3.2** and **3.3** for validation and use of SAAMs for tactical, contingency, or emergency operations.

1.5. Transportability Design Criteria. Configure hazardous materials (items and articles) to ensure transportability on military aircraft. Items in their shipping configuration and skidded or wheeled equipment must meet the transportability design criteria identified in MIL-HDBK-1791, *Designing for Internal Aerial Delivery in Fixed Wing Aircraft.*

1.6. General Packaging Requirements. Package hazardous materials in containers authorized by this manual, Title 49 *Code of Federal Regulations* (CFR) Part 173, *Shippers-General Requirements for Shipments and Packagings*, the *International Civil Aviation Organization* (ICAO) *Technical Instructions*, or the *International Air Transport Association* (IATA) *Dangerous Goods Regulation*. All packages and receptacles must be serviceable to include closures and cushioning material prior to use. Containers must be inspected and free of any incompatible residue, rupture or other damage that reduces the structural integrity. **Attachment 3** applies to all military air shipments. See **paragraph A17.2** for certification instructions.

1.7. Damaged or Improper Shipments. Do not transport any damaged, leaking, or improperly packed, marked, or labeled item or material.

1.7.1. It is the originator’s responsibility to correct noncompliant packaging. The originating shipping activity may provide the transportation function necessary packaging to correct the shipment, within the capability of the transportation function, or correct the packaging on site. Consider urgency of need when determining the best method for correcting a deficient shipment. Costs related to correcting a shipment are the responsibility of the originating shipping activity. Ensure compliance with applicable modal regulations when offering any shipment for transportation.

1.7.2. Report deficiencies on Standard Form (SF) 364, *Report of Discrepancy (ROD)* or equivalent reporting means as designated by the Service Focal Points. Report leaks from packages, equipment, and self-propelled vehicles during loading or unloading, or in flight as a packaging deficiency.

1.7.3. Immediately report any release of a hazardous substance in a quantity equal to or greater than its reportable quantity to the Environmental Protection Agency (EPA) by calling the US Coast Guard National Response Center at 800-424-8802 or 202-267-2675.

1.7.4. Consult local installation operating procedures for hazardous material emergency planning, response, and reporting requirements in the event of an incident involving hazardous materials.

1.7.5. Do not move dropped or damaged explosive items. The Transportation or Packaging Office will immediately contact Explosive Ordnance Disposal (EOD), safety or munitions personnel to determine disposition.

1.8. Stowing Hazardous Materials.

1.8.1. Ensure hazardous materials are compatible (**Attachment 18**) when stored in transit.

1.8.2. Ensure hazardous materials are accessible in flight.

1.8.3. Ensure hazard markings and warning labels are visible to aircrew and unloading personnel.

1.8.4. Do not stow hazardous materials susceptible to leaking on the same aircraft pallet with foodstuff, feed, or any other edible material intended for consumption by humans or animals. Solid material, such as explosive articles, may be loaded on the same aircraft pallet with foodstuffs based on operational requirements. If required by operational necessity, comply with the following when loading foodstuff or MRE's on the same 463L pallet with hazardous materials:

1.8.4.1. Do not load MREs or other edible material on the same pallet with any hazardous material liquid or Class/division 2.3 gases.

1.8.4.2. Separate hazardous materials (except Class 1) from the foodstuff/MREs by the greatest distance possible, but not less than 44 inches in all directions.

1.8.4.3. Do not load hazardous materials above the foodstuff/MRE's.

1.8.5. Packages bearing orientation arrow ("This Way Up") labels must be loaded, stowed and handled at all times according to label direction. Single packagings with end closures must be loaded and stowed with closures upward.

1.9. Protective Equipment. The base must ensure availability of protective equipment to cope with ground emergencies involving the cargo during loading operations. Coordinate respiratory and other personal protection requirements with the medical service. The aircraft operator will ensure appropriate equipment is available to protect aircrew and passengers when transporting materials whose vapors are toxic, irritating or corrosive. Aircraft must have a closed oxygen system or protective mask for each person aboard. The shipper will provide any required special equipment to meet unique cargo safety requirements. It is the shipper's responsibility, based on intimate knowledge of the material, to determine necessary required protective equipment. While the exact equipment required depends on the materials being transported, following are the recommended minimum (or equivalent substitutions):

1.9.1. Two pairs of rubber gloves.

1.9.2. One pair of protective gloves.

1.9.3. One plastic or rubber apron.

1.9.4. A five-pound (2.3 kg) package of incombustible absorbent material.

1.9.5. Three large plastic bags (4-mil thick, as a minimum).

1.9.6. One oxygen or protective mask for each person.

1.10. Unitized, Palletized, Overpacked, or Containerized Loads. Shippers must ensure aerial ports can handle loads. Ensure load configurations are:

1.10.1. Unitized loads will be as stable as a single container.

1.10.2. Freight containers (e.g., Internal airlift and helicopter Slingable Unit (ISU), Container Express (CONEX), Military-Owned Demountable Container (MILVAN), etc.) are not considered the outer package or overpack for any item stowed inside. Items within freight containers must be packaged as prescribed in this manual. Since air movement subjects cargo to rapid acceleration and deceleration, the contents of freight containers must be adequately secured/restrained to prevent damage or breakage from shifting. Consider both horizontal and vertical movement when securing/restraining the contents.

1.10.3. Mark and label individual packages within overpacks and freight containers according to this manual and Military Standard – 129 (MIL-STD-129), *Military Marking for Shipment and Storage*.

1.10.4. Designed to provide installed equipment in approved holders meeting airlift restraint criteria.

1.10.5. Compatible as required by **Attachment 18**.

1.10.6. Developed not using fiberboard or plywood sideboards unless specifically required by this manual.

1.10.7. Marked and labeled according to **Attachment 14** and **Attachment 15**.

1.10.8. To the greatest extent possible, place packages on aircraft pallets (e.g., 463L) and within/on freight containers, vehicles, and trailers so that markings required by **Attachment 14** and labels required by **Attachment 15** are visible.

1.10.8.1. For like items with the same classification, only one of the required hazard label(s) must be applied and visible.

1.10.8.2. For items with different hazard classifications, at least one package for each classification must be positioned so hazard label(s) are visible.

1.10.8.3. When placement prevents hazard labels from being visible, refer to A15.1.

1.10.9. The use of the overpack provision may be limited by requirements in **Paragraph A17.2.3.2**.

1.11. Accessibility. Do not ship hazardous material in freight containers that are not easily accessible to the aircrew during flight. Physically stow hazardous materials next to the container opening and position to allow access while on the aircraft. The aircrew must have visual and physical access to all hazardous materials to mitigate any hazard posed by an in-flight incident. If there is evidence of a leak, the crew-member can locate the hazard, determine the extent of the risk, and take appropriate action to get the leak under control or declare an in-flight emergency. Ensure air transportation personnel have access to the contents for inspection. Provide a key or combination for locked, unescorted containers to the aircraft commander or designated representative. Ship only the following hazardous materials in inaccessible containers or tactical shelters when properly secured:

1.11.1. Recompression vans, support vans, and shelters used by the Underwater Construction Team. Hazardous items inside these escorted containers have been identified to and approved for shipment by AFGLSC 401 SCMS/GUMA.

1.11.2. Fire extinguishers secured in appropriate holders or brackets, or properly packaged according to this manual.

1.11.3. Vehicles, support equipment (SE), or other mechanical apparatus. Completely drain (residual fuel not to exceed 17 oz) items fueled by a flammable liquid with a flash point at or above 38 degrees C (100 degrees F). Tightly seal fuel lines and tank to prevent residual fuel leaks. Drain and purge items fueled by a flammable liquid with a flash point below 38 degrees C (100 degrees F). Installed batteries must be non-spillable type or non-regulated and secured upright.

1.11.4. Items shipped under the Proper Shipping Name (PSN) "Life Saving Appliances" and packaged according to this manual.

1.11.5. Air conditioners and environmental control units, magnetic material, radioactive material, and thermometers.

1.11.6. Class/division 1.4S explosives packaged according to this manual.

1.11.7. Non-flammable gases or non-flammable aerosols prepared according to this manual and packed in strong outer containers.

1.11.8. "Consumer Commodities" not containing a liquid or a flammable gas.

1.11.9. Explosives secured for air movement according to service drawings.

1.12. Procedures for Airdropping Hazardous Materials. Prepare airdrop loads according to the TO 13C7/FM 10-500 series. Prepare, mark, label, certify, and accept airdrop hazardous cargo the same as air landed cargo.

1.13. Nuclear Weapons Material. Use the detailed information and procedures for preparing nuclear weapons material in DOE-DNA TP 45-51/Army TM 39-45-51/Navy SWOP 45-51/Air Force TO 11N-45-51, *Transportation of Nuclear Weapons Material* (including supplements). This document provides a chart indicating the air shipment compatibility of nuclear material with nonnuclear explosives and hazardous materials. Also, determine the inter-compatibility of explosives and hazardous materials according to **Attachment 18**. Packaging and handling of nuclear material not specifically outlined in the above document must meet the requirements of this manual.

1.14. Air and Space Interoperability Council (ASIC) Air Standards. Member nations (Australia, Canada, New Zealand, United Kingdom, and United States) agree in Air Standards 44/9 to accept the categorization and authorization by participating nations of explosives, radioactive materials, and dangerous cargo for onward carriage in their own military aircraft. Label shipments according to the ICAO, IATA, or by nationally approved labels. Certify the shipment meets all requirements for air transport.

1.15. North Atlantic Treaty Organization Standardization Agreement (NATO STANAG) 3854 , Policies and Procedures Governing the Air Transportation of Dangerous Cargo. Participating nations agree to apply the United Nations International System for the Classification of Dangerous Cargo for air transportation. This includes the labeling

(supplemented where necessary by ICAO or IATA labels) and certification. National regulations are still the authority for preparing, packing, aircraft stowing, and restraining dangerous cargo. Apply the national handling regulations of the carrier when transferring dangerous cargo from one nation to another for onward carriage. ***NOTE:*** **Paragraphs 1.14** and **1.15** are subject to international military standardization agreements. Do not make changes or deviations without authorization as prescribed in AFI 60-106, *The United States Air Force International Military Standardization Program, 1 December 1997* or Naval Air Systems Command (NAVAIR) Instruction 5711.1.

1.16. Mail Shipments. Shipment of hazardous material by mail is not permitted on military aircraft.

1.17. Transporting Foreign Troops. Transport hazardous materials belonging to non-U.S. military units using the same guidelines as for U.S. forces.

1.17.1. Comply with **paragraph 3.5** for hand-carried items.

1.17.2. Ensure use of serviceable United Nations (UN) specification containers or packaging approved by the competent authority of the transported force. Packaged hazardous materials must be properly marked and labeled to identify the contents. Comply with **A3.3.2.10** when transporting cylinders.

1.17.3. Equivalent foreign certification documents as approved by the competent authority of the transported force may be accepted in place of the AMC Form 1033, *Shipper's Declaration for Dangerous Goods* form. As a minimum, the foreign certification document must include in English, the proper shipping name, UN identification number, hazard class/division and compatibility group, packing group (if required), and quantity per package of hazardous materials.

1.18. Emergency Response Information. Do not offer for transportation, accept for transportation, transfer, store, or otherwise handle hazardous materials unless emergency response information is available at all times. The shipper must provide a 24-hour emergency response telephone number that is monitored at all times by personnel who are knowledgeable of the hazards and characteristics of the materials being shipped. This information is required in the event of an emergency involving the material. See **A17.2.9**.

1.19. Use of Commercial Airlift. Use DOT special permits 7573 (DOT SP-7573) and 9232 (DOT SP-9232), as outlined in **Attachment 23**, as required for AMC contracted commercial cargo airlift.

1.20. Exercises. Hazardous materials should not be air transported during an exercise solely to demonstrate movement capability when there is no planned operational use at the deployed location. When possible, inert material should be substituted for hazardous materials.

Chapter 2

DEVIATIONS, WAIVERS, AND SPECIAL REQUIREMENTS

2.1. Deviations and Waivers. Deviations and waivers are a departure from established procedures in this manual.

2.2. Passenger Movement Deviations. Do not transport passengers with hazardous materials coded as cargo aircraft only in **Table A4.1**, column 7 and **Table A4.2**. Passenger Eligibility "P" Codes. See **Attachment 22** for deviation authority, additional passenger information, and supplemental oxygen requirements.

2.3. Packaging and Compatibility Waivers. Waivers are exceptions to the packaging or compatibility requirements of this manual. Safety and risk management of airlift assets are the overriding factors for waiver consideration. Ease of operation, convenience, or program office preference are not reasons for waiver. Service focal points will not issue waivers if surface transportation is reasonably available.

2.3.1. Packaging Waivers. The shipper must obtain a waiver for any hazardous item or packaging not authorized in **Attachment 5** through **Attachment 13**. Submit waiver requests to your Service focal point (see **paragraph 1.2.2**) by letter, message, or telephone. Confirm waivers requested by telephone with a letter or message. Ensure receipt of the letter or message prior to issuing the waiver. A copy of the waiver must accompany the shipment. The DOD does not have authority to issue packaging waivers to UN specification requirements for items that at any time will move outside military controlled modes of transportation. Do not jeopardize safety for convenience or ease of operation. Any waiver that authorizes military airlift of a forbidden hazardous material identified in this manual, either primary or secondary hazard, must be coordinated with 401 SCMS/GUMA. To obtain a waiver, the shipper must:

2.3.1.1. Provide a detailed description of the package, including pertinent test data.

2.3.1.2. Provide the PSN, hazard class, identification number, packing group, and net quantity of the material.

2.3.1.3. Provide a detailed explanation why the established requirements cannot be met.

2.3.1.4. Provide a transportation analysis identifying why surface transportation cannot be effectively used.

2.3.2. Compatibility Waivers for Military Aircraft. A waiver is required when hazardous materials are not compatible according to **Table A18.1** and/or **Table A18.2** are shipped aboard the same military aircraft (see A18.4. for exceptions).

2.3.2.1. Shippers submit waiver requests to their Service focal point (see paragraph 1.2.2.) for approval. For Air Force aircraft, the major command (MAJCOM) or Commander of a unified command having operational control of the aircraft during the mission will be the waiver approval authority. Each service or MAJCOM will establish policy and procedures for approving compatibility waiver requests. Air Force approval authorities:

2.3.2.1.1. HQ AMC/SEW, (618) 229-0950, DSN 779-0950 (involving Class 1 only)

2.3.2.1.2. HQ AMC/A4TC, (618) 229-4434, DSN 779-4434 (Non-Class 1 only)

2.3.2.1.3. HQ PACAF, 13 AF/A4O, COM (808) 448-8775/448-1673, DSN 315-448-8775/448-1673. (***Note:*** 24/7 contact available via PACAF Command Center (PCC), COM (808) 448-8672, DSN 315-448-8672, DSN Secure 315-449-4301.)

2.3.2.1.4. HQ USAFE 603 AOC/AMD Airlift Requirements, 011-49-6371-405-7166/7146, DSN (314) 478-7166/7146. Outside of normal duty hours(0600-1600Z), call 001-49-6371-47-9292, DSN 314-480-9292 and ask for Requirements Stand-By person. (P4/P5 Local ATOC)

2.3.2.1.5. HQ ANG, National Guard Bureau Command Center, COM (301) 981-6001, DSN 858-6001

2.3.2.1.6. HQ AFRC, (478) 327-1718, DSN 497-1718

2.3.2.1.7. AFAFRICA Command, 617 AOC/AMD Airlift Requirements, COM 049-6371-405-1723, DSN 314-480-1723.

2.3.2.1.8. HQ SOCPAC/SOJ4, COM:(808) 477-3512 / 477-4353 / 477-5323 or DSN (315) 477-3512 / 477-4353/ 477-5323.

2.3.2.2. Waiver requests must contain the following information in 2.3.2.2.1. through 2.3.2.2.6.:

2.3.2.2.1. Reason incompatible materials require shipment together.

2.3.2.2.2. Reason for air movement and why other transportation modes cannot be used.

2.3.2.2.3. Statement that items are packaged or prepared as required by this manual and incompatible items are separated by greatest distance possible on the aircraft to reduce hazard in the event of a detonation, fire, or leak.

2.3.2.2.4. Provide intended date of movement, routing, and type of airlift required.

2.3.2.2.5. Provide national stock numbers; model numbers of explosive items; PSNs; hazard classes; identification numbers; quantity or net explosive weight (individual and total as applicable); and packaging paragraphs.

2.3.2.2.6. Provide points of contact at origin and destination bases.

2.3.3. Compatibility Waivers for AMC-Contracted (Commercial) Aircraft. Waivers are not authorized for the movement of incompatible hazardous materials on contracted commercial aircraft. Refer to **Attachment 23** for use of DOT-SP 7573 and DOT-SP 9232.

2.3.4. Operational Necessity Waivers. Variations to the requirements of this manual are authorized for a specific mission when strategic and compelling reasons exist. The Service/MAJCOM having operational control of the aircraft must approve the operating procedures for specific missions. United States Transportation Command (USTRANSCOM) approves operating procedures for overall program management of strategic lift assets operated by HQ AMC. This paragraph applies to the following conditions:

2.3.4.1. Recovery of downed aircraft. A waiver is required for the packaging/preparation of aircraft/Unmanned Aerial Vehicle (UAV) when not prepared IAW the appropriate

Technical Order (T.O.). Waiver requests must be initiated by the user/owner (for example, Battlespace). The user/owner must complete a MFR detailing all the hazards that exist, or no longer exist based on determinations by EOD, other expert(s), and a review of the T.O. Ensure that owner/user addresses every part of the aircraft/UAV that is hazardous as listed in the T.O. which details aircraft/UAV preparation for shipment. Confirm that no leaks, fumes, or potential detonation hazards exist. EOD will inspect and identify in writing whether explosive material is present or has been cleared. It is incumbent on the requestor to ensure aircraft/UAVs are safe to move and experts have evaluated entire object. The Installation Transportation Officer (ITO) will then create a memo describing the hazards that must be certified, and address hazards not requiring certification. Technically capable personnel (user/ITO) will assess the packaging and ensure it will contain/hold the aircraft/UAV. Describe in detail how the item is packaged for air transport. (For example, This UAV is packed in an Aircraft Coffin (a case), weighing 3325 and total cube is 497. The case is considered airtight when it is closed, sealing the contents inside.) If it is determined hazard(s) exist but cannot be properly certified IAW the aircraft/UAV T.O., staff the memorandums to the servicing MAJCOM. The servicing MAJCOM will staff the waiver request to the MAJCOM with operational control of the transport aircraft. The ITO or Customs official will notify the DOD Customs Program Manager, USTRANSCOM J5J4-PT for clearance of the transport aircraft to its destination within the Continental United States (CONUS).

2.3.4.2. Emergency rescue operations.

2.3.4.3. Movement of portable generators to support critical and key functions where power has been disrupted.

2.3.4.4. Movement of fueled SE to replace inoperative equipment supporting an ongoing mobility exercise or operational plan. Equipment may be transported with fuel not to exceed one-half tank.

2.3.4.5. Shipments in accordance with the requirements of AFI 11-289, *Phoenix Banner, Phoenix Silver, and Copper Operations.*

2.3.5. Intelligence or Criminal Investigations. Variations to the requirements of this manual are authorized for airlift of hazardous materials involved in intelligence or criminal investigations. Qualified personnel of those agencies responsible for the cargo must certify that all safety precautions have been taken to transport the materials safely. The shipper must ensure compliance with as many requirements of this manual as possible. This authorization is valid only for movement out of an austere environment. At the first secure in-route airfield, the cargo must be prepared according to this manual or **paragraph 2.3.1**.

2.4. DOT Special Permits. A DOT special permit is authority to deviate from the requirements of 49 CFR Parts 100-199. Use special permits as authority for shipment by military controlled air movement, if applicable. Follow all requirements of the permit.

2.4.1. The shipping activity must provide a copy of the permit for each shipment. If the approval date on the permit has expired, but a renewal has been applied for, enter, "Renewal Requested, Current Special Permit Still Valid". Place this statement on the permit after verifying renewal request with the Service Focal Point.

2.4.2. The permit must accompany the cargo in the Defense Transportation System.

2.4.3. Maintain a copy of the permit at each facility where it is used in connection with the transportation of the hazardous material.

2.4.4. Do not use DOT special permits for international shipments unless the item is exempted from UN specification requirements (see **paragraph A3.1.1.1**).

2.4.5. Forward requests for new permits or copies of existing permits according to the DTR 4500.9-R, Part II.

2.4.6. DOT Exemptions may continue to be used until their expiration date. If renewed, they will be replaced by DOT Special Permits.

2.5. Competent Authority Approvals (CAA). A CAA is an approval issued by a national agency responsible under its national law for the regulation of hazardous materials transportation. These may also be referred to as "Special Approvals." The U.S. Competent Authority is the U.S. Department of Transportation (DOT). CAAs are used for both domestic and international shipment. All approvals must be in English.

2.5.1. Packaging CAAs. A CAA may be issued for packaging or other transportation requirements when specified by the responsible national agency for the originating shipment. These include CAAs issued by the U.S. Competent Authority and foreign agencies.

2.5.1.1. Use the CAA as authority for military air shipment.

2.5.1.2. Follow all requirements of the approval.

2.5.1.3. The shipping activity must provide a copy of the CAA for each shipment.

2.5.1.4. The CAA must accompany the cargo in the Defense Transportation System (attach copy to the Shipper's Declaration for Dangerous Goods).

2.5.1.5. Request copies of existing CAAs according to the DTR 4500.9-R, Part II.

2.5.2. Explosive Hazard Classification and Approvals. The Associate Administrator may also issue explosive hazard classification approval(s). These may also be referred to as CAs. See **paragraph A3.3.1.4** for applicability of DOT and foreign nation issued explosive classification approvals for military air shipments. If packaging requirements are included as part of a DOT explosive hazard classification approval, use the CA as authority for air shipment. If there is no approval number assigned to the CA, the shipping activity will certify the shipment to **paragraph A5.3** and attach a copy of the approval document to the Shipper's Declaration of Dangerous Goods (see **Table A17.1**). Explosive hazard classification and approval(s) without packaging instructions cannot be used as a certification reference.

2.5.2.1. For the retrograde movement of Foreign Military Sales (FMS) procured explosives, the FMS purchasing country is required to obtain explosive hazardous class approvals from the DOT.

2.5.3. Requests for CAAs. Follow the procedures outlined in DLAD 4145.41/AR 700-143/AFI 24-210_IP/NAVSUPINST 4030.55/MCO 4030.40A, *Packaging of Hazardous Material*, **http://www.dla.mil/dlaps/dlad/d4145.41.pdf**, to request a CAA from the U.S. Competent Authority.

2.5.3.1. The FMS purchasing country must follow the procedures outlined in the DOD 5105.38-M, *Security Assistance Management Manual (SAMM)*, Chapter 7, Paragraph C7.18.

2.6. DOD Certification of Equivalency (COE). A COE is a certification that the proposed packaging equals or exceeds the requirements of 49 CFR Parts 100-199. Use COEs as authority for shipment by military air, if applicable. Follow all requirements of the approval.

2.6.1. The shipping activity must provide a copy of the COE for each shipment.

2.6.2. The COE must accompany the cargo in the Defense Transportation System.

2.6.3. A COE may be used between a domestic APOE and a domestic APOD or on a military controlled aircraft from a non-domestic APOE to a domestic APOD. Refer to DTR 4500.9-R, Part II, *Cargo Movement*, for other authorized COE modes of transportation.

2.6.4. Do not use COEs for international air shipments unless the item is exempted from UN specification requirements (see **paragraph A3.1.1.1**) or the item, at all times, is transported by military controlled airlift and will not change modes of transportation at a non-domestic APOD.

2.6.5. COE issuing officials, as identified in the DTR 4500.9-R, Part II, follow guidance in DLAD 4145.41/ AR 700-143/AFI 24-210_IP/NAVSUPINST 4030.55/MCO 4030.40, for approving COEs. Any COE that approves military airlift of a hazardous material that is forbidden by this manual, either primary or secondary hazard, must be coordinated with the respective Service Focal Point and AFGLSC 401 SCMS/GUMA.

2.7. Limited and Excepted Quantities. Use good quality packaging specified in **Attachment 19** to ship small quantities of hazardous materials aboard military aircraft. Personnel may use UN specification packaging even though it's not required.

2.8. Complying With Special Cargo Requirements. Ensure any Inhalation Hazard Zone A material (as identified by Special Provision 1 in **Table A4.1**, column 7); Class 1, compatibility group K; Fissile Class III Radioactive Materials; infectious substances and biological research materials requiring a technical escort comply with the extensive protective measures outlined in **Attachment 24**.

Chapter 3

TACTICAL, CONTINGENCY, OR EMERGENCY AIRLIFT

3.1. Purpose. This chapter identifies procedural exceptions in support of the DOD, Federal agencies, and allies providing sustained, immediate, and responsive air movement, and delivery of personnel and hazardous material to, within, or from objective areas under tactical, contingency, or emergency conditions. Because of the increased risk to the aircraft; air crew; and participants, these procedural exceptions must only be used when there are validated operational requirements. This chapter does not apply to helicopters being used for insertion or extraction of combat troops to, from, or within a combat area.

3.2. Approval For Use.

3.2.1. When operational requirements are validated, the use of this chapter will be included in Operating Plans (OPlans).

3.2.2. USTRANSCOM Deployment Distribution Operations Center (DDOC) approves the use of provisions of this chapter for airlift missions not identified in the OPlan. The Service/MAJCOM having operational control of the deploying unit must justify the applicability of this chapter in the airlift request.

3.2.3. Provisions of this chapter may be used for Joint Chiefs of Staff (JCS), component, and unilateral mobility exercises designed to simulate and evaluate responsiveness to tactical, contingency, or emergency situations requiring airlift when use is identified according to **paragraph 3.2.1** or **paragraph 3.2.2**.

3.3. General Requirements and Restrictions.

3.3.1. **Chapter 3** approval will be included as part of airlift mission execution documentation (e.g., Global Decision Support System (GDSS) Form 59, Flight Advisory, etc.).

3.3.2. Comply with DTR 4500.9-R, Part III, *Mobility* for movement of cargo and personnel during deployments. Comply with other Parts of the DTR when applicable.

3.3.3. Do not use the provisions of this chapter during redeployments unless mission readiness is affected.

3.3.4. Unless otherwise specified, comply with the packaging configurations specified in **Attachment 5** through **Attachment 13** and **Attachment 27**. Refer to **Attachment 3** for any additional requirements. Do not remove hazardous materials from their required packaging except as authorized in this chapter.

3.3.5. Refer to **Attachment 22** concerning movement of personnel with hazardous materials.

3.3.6. Observe all practical ground and flight rules and brief each aircraft commander (or representative designated by the commander) according to **Attachment 21**.

3.3.7. Do not transport hazardous cargo aboard tactical or strategic aeromedical evacuation aircraft. The field commander may allow the transportation of casualties on aircraft carrying hazardous cargo in extreme circumstances that may result in potential loss of life.

3.3.8. This chapter does not apply to contract or commercial airlift. Refer to **Attachment 23** when using DOT Special Permits for AMC contracted commercial airlift.

3.3.9. Apply these provisions to notional tasking of Standard Air Munitions Package/Standard Tank Rack Adapter and Pylon Package (STAMP/STRAPP) and deployable munitions packages, as directed by HQ AFMC/A4MW.

3.3.10. Refer to DTR 4500.9-R for manifesting requirements.

3.4. Specific Operational Requirements. The following operational requirements must be validated and approved according to **paragraph 3.2**.

3.4.1. Unpackaged explosives (see A5.2).

3.4.2. Vehicles and equipment fuel-in-tank-operational fuel levels (see **A13.4** and **A13.5**).

3.4.3. Incompatible items on the same aircraft (see **A18.4**).

3.4.4. Personnel hand carrying hazardous materials (see **paragraph 3.5**).

3.5. Basic Combat Load or Individual Issue. Personnel are permitted to carry their basic combat load or individual issue of hazardous materials removed from its required packaging under the following conditions.

3.5.1. Personnel will engage an enemy force immediately upon deplaning at the objective or will be airdropped. The following requirements apply:

3.5.1.1. Personnel must not handle explosives and other hazardous materials during flight operations.

3.5.1.2. Ensure all individual hazardous materials are safe from accidental initiation (i.e., grenades in fiber containers, safety pins secured, etc.).

3.5.1.3. Ensure all small arms ammunition remain in the individual carrier (for example, bandoleers, ammunition belts, pouches), and all weapons remain clear until the aircraft has landed.

3.5.1.4. Ensure all chemical, biological, radiological, and nuclear (CBRN) equipment remains in the individual carrier (for example, protective mask bag, mobility bag), and accompany the individual at all times. First aid kit components must remain within individual kit carriers or pouches.

3.5.1.5. Prepare all hazardous material, other than small arms ammunition, CBRN equipment, and first aid kits for shipment according to this manual, consolidate in one central location on the aircraft as directed by the loadmaster, and distribute to personnel before landing.

3.5.1.6. Lithium batteries installed in electronic equipment battery box or compartment require no additional packaging. Individuals may hand carry (pockets, rucksack, backpacks, etc.) the minimum number of spare lithium batteries required to sustain the immediate operation (as determined by the troop commander). Pack hand carried lithium batteries in original wrapping or in nonconductive material to prevent external short-circuiting. Prepare equipment containing lithium batteries, not considered individual issue or basic combat, according to A13.7., A13.8., or A13.9.

3.5.1.7. The troop commander or team chief must brief the aircraft commander or designated representative (i.e. loadmaster) on the location of all hazardous materials.

3.5.1.8. Provisions of this paragraph may be used during exercises when identified in the exercise operations plan. Except for small arms ammunition, CBRN equipment, and first aid kits, items will not be shipped unpackaged unless there is intent to use explosives and other hazardous materials upon exiting the aircraft or as part of an airdrop exercise. Use and employment of unpackaged or hand carried explosives and other hazardous materials will be included in the exercise operations plan.

3.5.1.9. See **Attachment 23** for use of contract air carriers operating under DOT-SP 9232.

3.5.1.10. A Shipper's Declaration for Dangerous Goods is not required.

3.5.2. Personnel not immediately engaging the enemy force when deplaning, but will assume a tactical mission on arrival or re-deploying upon mission completion, may deploy with their basic load or individual issue of hazardous materials in accordance with **paragraph 3.5.1**. However, the troop commander must collect these items, including small arms ammunition, before the anti-hijack briefing. On arrival at the aircraft, the troop commander must brief the loadmaster on the hazardous materials and assist the loadmaster, as directed, in the tie-down before departing. The hazardous materials will be redistributed on arrival at destination. If required, apply these provisions to redeployment of troops upon mission completion. A Shipper's Declaration for Dangerous Goods is not required.

3.6. Passenger Eligibility. Participants in tactical, contingency, emergency, or deployment operations, including exercises, transported on military organic aircraft according to this chapter are not considered passengers for purposes of this manual. If passenger seats are released to nonparticipants, the cargo must not be prepared using a provision authorized under the authority of this chapter and the requirements of 2.2 apply. Refer to **Attachment 23** for contract airlift of personnel under DOT-SP 9232.

3.7. Chemically Contaminated Cargo. Decontaminate items to the greatest extent possible in the theater in which they became contaminated. Destroy reusable wood and fiberboard containers in the theater in which they became contaminated. Decontaminate reusable shipping containers other than wood and fiberboard (drums, etc.) before reusing. Double wrap palletized cargo that is susceptible to exposure to contamination. Remove the outside wrap if exposed to contamination (the inner wrap should protect the cargo). Destroy the contaminated outside wrap in the theater in which it became contaminated. Package according to **A13.20**.

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Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

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Shippers Declaration for Dangerous Goods

GDSS Form 59

Hazmat Acceptance and Inspection Checklist

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Abbreviations and Acronyms

AFGLSC—Air Force Global Logistics Support Center

AFMC—Air Force Materiel Command

AMC—Air Mobility Command

ASIC—Air and Space Interoperability Council

ASME—American Society of Mechanical Engineers

ASTM—American Society for Testing and Materials

ATOC—Air Terminal Operations Center

CAA—Competent Authority Approval

CBRN—Chemical, Biological, Radioactive, and Nuclear

CERCLA—Comprehensive Environmental Response, Compensation, and Liability Act

CDC—Centers for Disease Control and Prevention

CFR—Code of Federal Regulations

COE—Certification of Equivalency

CONUS—Continental United States

CRAF—Civil Reserve Air Fleet

CRR—Complete Round Rigging

DACG—Departure Airfield Control Group

DLA—Defense Logistics Agency

DMET—Defense Management Education and Training

DOD—Department of Defense

DOT—Department of Transportation

DSN—Defense Switched Network

DTS—Defense Transportation System

EOD—Explosive Ordnance Disposal

EPA—Environmental Protection Agency

ERG—Emergency Response Guidebook

FAR—Federal Acquisition Regulation

FMS—Foreign Military Sales

FPM—Federal Personnel Manual

FRH—Flameless Ration Heater

GDSS—Global Decision Support System

HMIRS—Hazardous Material Information Resource System

IAEA—International Atomic Energy Agency

IATA—International Air Transportation Association

IBD—Inhabited Building Distance

ICAO—International Civil Aviation Organization

ID—Identification

IHC—Interim Hazard Classification

IMDG—International Maritime Dangerous Goods

IRFNA—Inhibited Red Fuming Nitric Acid

ISO—International Standards Organization

ITO—Installation Transportation Officer

JCS—Joint Chiefs of Staff

KPa—Kilopascal

LSA—Low Specific Activity

MAJCOM—Major Command

MCC—Mobility Control Center

MEGC—Multiple-Element Gas Container

MILVAN—Military Van

MOS—Military Occupational Specialty

MRE—Meals Ready to Eat

MRSP—Mobility Readiness Spares Package

MSL—Military Shipping Label

NA—North American

NEW—Net Explosive Weight

N.O.S.—Not Otherwise Specified

OCONUS—Outside Continental United States

Oplans—Operating Plans

OPR—Office of Primary Responsibility

PCB—Polychlorinated Biphenyls

PG—Packing Group

POD—Port of Debarkation

POE—Port of Embarkation

POP—Performance Oriented Packaging

PPM—Parts Per Million

PSI—Pounds Per Square Inch

PSIA—Pounds Per Square Inch Absolute

PSIG—Pounds Per Square Inch Gauge

PSN—Proper Shipping Name

RQ—Reportable Quantity

SAAM—Special Assignment Airlift Mission

SCF—Standard Cubic Feet

SCFH—Standard Cubic Feet per Hour

SCMS—Supply Chain Management Squadron

SE—Support Equipment

SPI—Special Packaging Instruction

STAMP—Standard Air Munitions Package

STRAPP—Standard Tank Rack Adapter and Pylon Package

TCN—Transportation Control Number

UN—United Nations

USG—United States Government

USTRANSCOM—United States Transportation Command

Terms

A1—The maximum activity of special form radioactive material permitted in a type A package.

A2—The maximum activity of radioactive material, other than special form, low specific activity radioactive material, and surface contaminated objects permitted in a type A package. These values are either listed in A11.4 or may be derived using the procedure in A11.3.

Activity (Radioactivity)— The number of radioactive atoms that decay per unit time. The unit of activity is the curie or bequerel. The amount of radioactivity that may be transported in various types of packages and various types of vehicles.

Aerial Port of Debarkation (APOD)— Any airfield location where hazardous materials are received by military controlled airlift whether by channel, SAAM, airdrop, exercise, or deployment.

Aerial Port Of Embarkation (APOE)— Any airfield location where hazardous materials are entered into the Defense Transportation System IAW DTR 4500.9-R, for movement by military controlled airlift whether by channel, SAAM, airdrop, exercise, or deployment.

Aerosol—Any non-refillable receptacle containing a gas compressed, liquefied, or dissolved under pressure, the sole purpose of which is to expel a nonpoisonous (other than a division 6.1 packing group III material) liquid, paste, or powder and fitted with a self-closing release device allowing the contents to be effected as solid or liquid particles in suspension in a gas, as a foam, paste, or powder, or in a liquid or gaseous state.

Article—A manufactured item, containing a hazardous material or substance, in a specific shape or design which end use is dependent on the shape or design. The shape or design prevents loss of hazardous contents during normal conditions of transport.

Atmospheric Pressure—Atmospheric pressure is 101.3kPa (14.7 psi).

Aviation Regulated Solid or Liquid—Any material which has a narcotic, noxious, or other properties such that in the event of spillage or leakage on an aircraft, extreme annoyance or discomfort could be caused to crew members so as to prevent the correct performance of assigned duties.

Bag—A flexible packaging made of paper, plastic film textiles, woven material or other similar materials.

Becquerel (Bq)—The unit of measure for the activity of a radioactive material. Because this is a very small unit of measure (1 Bq = one atomic transformation per second), the standard is the larger multiple terabecquerel (TBq). One TBq = one trillion Bq. Other multiples may also be used (MBq, GBq). This unit of measure is used when measuring how radioactive the item is.

Biological Product—A virus, therapeutic serum, toxin, antitoxin, vaccine, blood, blood component or derivative, allergenic product, or analogous product used in the prevention, diagnosis, treatment, or cure of diseases in humans or animals. A biological product includes a material manufactured and distributed in accordance with one of the following provisions:

1. Title 9,Code of Federal Regulations, Part 102, *Licenses for Biological Products, current edition*; 9 CFR Part 103 (*Experimental Products, Distribution, and Evaluation of Biological Products Prior to Licensing*); 9 CFR Part 104, *Permits for Biological Products*;

2. Title 21 Code of Federal Regulations Part 312 *Investigational New Drug Application*; 21 CFR Part 314 *Applications for FDA Approval to Market a New Drug*; 21 CFR Parts 600 to 680, *Biologics*; or 21 CFR Part 812 *Investigational Device Exemptions*. Unless otherwise excepted, a *biological product* known or reasonably expected to contain a pathogen that meets the definition of a Category A or B infectious substance must be assigned the identification number UN2814, UN2900, or UN3373, as appropriate.

Biological Substances, Category B - An infectious substance not in a form generally capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy humans or animals when exposure to it occurs.

Bottle—An inner packaging having a neck of relatively smaller cross section than the body and an opening capable of holding a closure for retention of the contents.

Box—A packaging with complete rectangular or polygonal faces made of metal, wood, plywood, reconstituted wood, fiberboard, plastic, or other suitable material.

Bulk Packaging— A packaging, other than a vessel or a barge, including a transport vehicle or freight container, in which hazardous materials are loaded with no intermediate form of containment. A Large Packaging in which hazardous materials are loaded with an intermediate form of containment, such as one or more articles or inner packagings, is also a bulk packaging. Additionally, a bulk packaging has: a maximum capacity greater than 450 L (119 gallons) as a receptacle for a liquid; a maximum net mass greater than 400 kg (882 pounds) and a maximum capacity greater than 450 L (119 gallons) as a receptacle for a solid; or a water capacity greater than 454 kg (1000 pounds) as a receptacle for a gas as defined in 49 CFR §173.115.

Channel Airlift—Common user airlift service provided on a scheduled basis between two points.

Class 1 (Explosives)—Any substance or article (including a device) which is designed to function by explosion (i.e., an extremely rapid release of gas and heat). Unless the substance or article is otherwise classed in **Table A4.1**, the term "explosive" may also refer to an item that is able to produce a chemical reaction within itself and is able to function in a similar manner even if not designed to function by explosion. Explosives in Class 1 are divided into six divisions as follows:

1. Division 1.1-Consists of explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.

2. Division 1.2-Consists of explosives that have a projection hazard but not a mass explosion hazard. Additionally, there are three subdivisions (1.2.1, 1.2.2 and 1.2.3). Refer to DOD 6055.9-STD, DOD *Ammunition and Explosives Safety Standards*, for specific subdivision definitions.

3. Division 1.3-Consists of explosives that have a fire hazard and a minor blast hazard or a minor projection hazard (or both), but not a mass explosion hazard.

4. Division 1.4-Consists of explosive devices that present a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.

5. Division 1.5-Consists of very insensitive explosives. This division is comprised of substances which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal transportation conditions.

6. Division 1.6-Consists of extremely insensitive articles that do not have a mass explosion hazard. This division is comprised of articles which contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation. The risk from these articles is limited to the explosion of a single article.

Class 2.1 (Flammable Gas)—Any material that is a gas (boiling point) at 20 degrees C (68 degrees F) or less and has a pressure of 101.3 kPa (14.7 psi), in addition to one of the following properties:

1. Is ignitable at 101.3 kPa (14.7 psi) when in a mixture of 13 percent or less by volume with air.

2. Has a flammable range of 101.3 kPa (14.7 psia) with air of at least 12 percent regardless of the lower limit. 3. The limits specified above shall be determined at 101.3 kPa (14.7 psia) of pressure and a temperature of 20 degrees C (68 degrees F) according to ASTM E681-85 Standard Test Method for Concentration Limits of Flammability of Chemicals.

Class 2.2 (Nonflammable, Nonpoisonous Compressed Gas, Including Compressed Gas, Liquefied Gas, Pressurized Cryogenic Gas, Compressed Gas in Solution, asphyxiant gas and oxidizing gas)— Any material (or mixture) which exerts in the packaging a gauge pressure of 200 kPa (29 psig/43.8 psia) or greater at 20 degrees C (68 degrees F), is a liquefied gas or is a cryogenic liquid, and does not meet the definition of Division 2.1 or 2.3.

Class 2.3 (Gas Poisonous by Inhalation)—Any material that is a gas (boiling point) at 20 degrees C (68 degrees F) or less and has a pressure of 101.3 kPa (14.7 psia), in addition to one of the following properties:

1. The material is known to be so toxic to humans as to pose a hazard to health during transportation.

2. In the absence of adequate data on human toxicity, the material is presumed to be toxic to humans because when tested it has an LC_{50} (inhalation toxicity) value of not more than 5000 parts per million (ppm).

Class 3 (Flammable Liquid)—A flammable liquid is any liquid having a flash point equal to or below 60 degrees C (140 degrees F), except:

1. Any liquid meeting the definition of a Class 2 material.

2. Any mixture having one or more compounds with a flash point above 60 degrees C (140 degrees F) that makes up at least 99 percent of the total volume of the mixture. Distilled spirits of 140 proof or lower are considered to have a flash point no lower than 23 degrees C (73 degrees F).

Class 4.1 (Flammable Solids)—Flammable solids consist of solids (other than those classed as explosives) which are readily combustible under conditions encountered in transport, or may cause or contribute to fire through friction.

Class 4.2 (Spontaneously Combustible Material)—Liquids or solids which are prone to spontaneous heating under normal conditions encountered in transport or to heating in contact with air, thus being liable to ignite.

Class 4.3 (Dangerous When Wet Material)—Solids that are liable to become spontaneously flammable or emit flammable or toxic gases when they come into contact with water.

Class 5.1 (Oxidizers)—A material that may cause or enhance the combustion of other material, generally by yielding oxygen.

Class 5.2 (Organic Peroxides)—Any organic compound containing oxygen (O) in the bivalent -O-O- structure, and which may be considered a derivative of hydrogen peroxide where one or more of the hydrogen atoms have been replaced by organic radicals. Organic peroxides are thermally unstable substances which may undergo exothermic self-accelerating decomposition. These substances may be prone to explosive decomposition or rapid burning; be sensitive to impact or friction; react dangerously with other material; or cause damage to the eyes. A material which meets this definition must be classed in Class 5.2, unless it also meets the definition of a Class 1 material, or unless the available oxygen content of an organic peroxide formulation is less than the amount specified (by the percentage equation) in 49 CFR §173.128.

1. Type A: An organic peroxide that can detonate or deflagrate rapidly as packaged for transport. Transportation of type A organic peroxides is forbidden.

2. Type B: An organic peroxide that, as packaged for transport, neither detonates nor deflagrates rapidly, but can undergo a thermal explosion.

3. Type C: An organic peroxide that, as packaged for transport, neither detonates or deflagrates rapidly and cannot undergo a thermal explosion.

4. Type D: An organic peroxide which exhibits the following characteristics:

4.1. Detonates only partially, but does not deflagrate rapidly and is not affected by heat when confined.

4.2. Does not detonate, deflagrates slowly, and shows no violent effect if heated when confined.

4.3. Does not detonate or deflagrate, and shows a medium effect when heated under confinement.

5. Type E: An organic peroxide that neither detonates or deflagrates, and shows low or no effect when heated under confinement.

6. Type F: An organic peroxide that will not detonate in a cavitated state, does not deflagrate, shows low or no effect if heated when confined, and has low or no explosive power.

7. Type G: An organic peroxide that will not detonate in a cavitated state, will not deflagrate, shows no effect when heated under confinement, has no explosive power, is thermally stable (self—accelerating decomposition temperature is 50 degrees C (122 degrees F) or higher for a 50 kg (110 pounds) package). An organic peroxide meeting all characteristics of type G except thermal stability and requiring temperature control is classed as a type F, temperature control organic peroxide.

Class 6.1 (Poisonous Material)—A material, other than a gas, which is known to be so toxic to humans as to afford a hazard to health during transportation, or is presumed to be toxic to humans because it falls within one of the test categories identified in 49 CFR §173.132. The term "toxic" and "poisonous" are used synonymously in this manual.

Class 6.2 (Infectious Substances)—A material known to contain or suspected of containing a pathogen. A pathogen is a virus or micro-organism (including bacteria viruses, rickettsiae, parasites, fungi), or other agent such as a proteinaceous infectious particle (prion) that can cause disease in humans or animals. Division 6.2 materials are assigned to the following categories:

1. Category A – An infectious substance which is transported in a form that, when exposure to it occurs, is capable of causing permanent disability, life-threatening or fatal disease in otherwise healthy humans or animals, and is assigned UN2814 or UN2900, as appropriate.

2. Category B – An infectious substance which does not meet the criteria for inclusion in Category A, and is assigned UN3373. Formerly known as "diagnostic specimens," Category B materials are now described as "Biological Substances, Category B."

Class 7 (Radioactive Material)—Any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values in **Table A11.1**.

Class 8 (Corrosive Material)—A liquid or solid that causes full thickness destruction of human skin at the site of contact within a specified period of time. A liquid, or a solid which may become liquid during transportation, that has a severe corrosion rate on steel or aluminum based on the criteria in 49 CFR §173.137(c)(2) is also a corrosive material. The main hazard from Class 8 liquids and vapors is the corrosive effect on humans and the aircraft or cargo. Some Class 8 materials have very dangerous additional hazards such as toxicity, flammability, and explosiveness.

Class 9 Material—A material that may pose an unreasonable risk to health, safety, or property during transport, but does not meet any of the definitions of the other hazard classes specified in this manual. This class includes:

1. A material that has an anesthetic, noxious, or other similar property which can cause extreme annoyance or discomfort to passengers and crew in the event of leakage during transportation, so as to prevent the correct performance of the crews assigned duties.

2. A material in quantities that meets the definition of a hazardous waste or a hazardous substance, but does not meet the definition of any other class.

Combination Packaging—A combination of packaging, for transport purposes, consisting of one or more inner packagings secured in a nonbulk outer packaging. It does not include a composite packaging.

Combustible Liquid—A combustible liquid is any liquid that does not meet the definition of any other classification specified in this manual and has a flash point above 60 degrees C (140 degrees F) and below 93 degrees C (200 degrees F). Any mixture having one or more components with a flash point of 93 degrees C (200 degrees F) or higher, that makes up at least 99 percent of the total volume of the mixture is not a combustible liquid.

Compatibility Group Letter—A designated alphabetical letter used to categorize different types of explosive substances and articles for stowage and segregation.

Complete Round Rigging (CRR)— All items, to include those normally incompatible (e.g. primers, propelling charges, projectiles, fuses, etc.), necessary to complete an end item when configured, packaged or unpackaged, on the same pallet or platform according to a Service approved technical order or publication.

Composite Packaging—Packaging consisting of an outer packaging and inner receptacle, so constructed that the inner receptacle and the outer packaging form an integral packaging. Once assembled it remains thereafter an integrated single unit; it is filled, stored, shipped, and emptied as such.

Compressed Gas in Solution—A nonliquefied compressed gas dissolved in a solvent.

Consignment—A package or group of packages or load of radioactive material offered by a person for transport in the same shipment.

Consumer Commodity—A material that is packaged and distributed in a form intended or suitable for retail sale for purposes of personal care or household use. This does not include material designed for military or industrial use that is not readily available from commercial retail sources.

Contaminated Sharps— Any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

Contamination—The presence of a radioactive substance on a surface in quantities in excess of 0.4Bq/ cm^2 for beta and gamma emitters and low toxicity alpha emitters or 0.04Bq/cm^2 for all other alpha emitters. Contamination exists in two phases:

1. Fixed radioactive contamination means radioactive contamination that cannot be removed from a surface during normal conditions of transport.

2. Nonfixed radioactive contamination means radioactive contamination that can be removed from a surface during normal conditions of transport.

Contingency—An emergency involving military forces caused by natural disasters, terrorists, subversives, or by required military operations. Due to the uncertainty of the situation, contingencies require plans, rapid response, and special procedures to ensure the safety and readiness of personnel, installations, and equipment.

Conveyance—Any aircraft for the purposes of this manual.

Crate—An outer packaging with incomplete surfaces.

Criticality Safety Index (CSI)—A number (rounded up to the next tenth) which is used to provide control over the accumulation of packages overpacks or freight containers containing fissile material. The CSI for packages containing fissile material is determined in accordance with the instructions provided in 10 CFR Part 71. The CSI for an overpack, freight container, or consignment or consignment containing fissile material packages is the sum of the CSIs of all the fissile material packages contained within the overpack, freight container or consignment.

Cryogenic Liquid—A refrigerated liquefied gas having a boiling point colder than -90 degrees C (-130 degrees F) at 101.3 kPa (14.7 psi) absolute. A material meeting this definition is subject to requirements of **Attachment 6**, regardless of whether it also meets the definition of a nonflammable, nonpoisonous compressed gas. The material is partially described as "(* * *), refrigerated liquid (cryogenic liquid)" in **Table A4.1**, (with the asterisks replaced by the name of the gas).

Cultures or Stocks—Materials prepared and maintained for growth and storage and containing a Category A or B infectious substance.

Cylinder—A pressure vessel designed for pressures higher than 40 psia and having a circular cross section.

Dangerous Goods— Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the International Air Transport Association (IATA) Dangerous Goods Regulations, the International Civil Aviation Organization (ICAO) Technical Instructions, or the Items Listing (**Table A4.1**) in this manual. The term Dangerous Goods is synonymous with Hazardous Materials.

Depleted Uranium—Uranium containing less uranium-235 than the naturally occurring distribution of uranium isotopes.

Dermal Toxicity—A material with an LD_{50} for acute dermal toxicity of not more than 1000 mg/kg.

Design—The description of a special form material, a package, or a packaging, that enables those items to be fully identified. The description may include specifications, engineering drawings, reports meeting regulatory requirements, and other relevant documentation.

Diagnostic Specimens— Now called “Biological Substances, Category B.” See Class 6.2 (Infectious Substances) for “Category B” definition.

Diluent Type A—An organic liquid that does not damage the thermal stability or increase the hazard of the organic peroxide and with a boiling point not less than 150 degrees C (302 degrees F) at atmospheric pressure. Type A diluents may be used for desensitizing all organic peroxides.

Diluent Type B—An organic liquid that does not damage the thermal stability or increase the hazard of the organic peroxide and with a boiling point, at atmospheric pressure, of less than 150 degrees C (302 degrees F) but at least 60 degrees C (140 degrees F), and a flash point greater than 5 degrees C (41 degrees F). Type B diluents are only used when specified in **Table A9.1**. The boiling point of a type B diluent must be at least 60 degrees C (140 degrees F) above the

control temperature of the organic peroxide. A type A diluent may be substituted for a type B diluent in equal concentration.

Division—A subdivision of a hazard class.

Domestic Addressee—The continental United States, Alaska, Hawaii, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Virgin Islands, American Samoa, Guam, and other US Territories.

Drum—A flat-ended or convex-ended cylindrical packaging made of metal, fiberboard, plastic, plywood, or other suitable materials.

Emergency—An emergency operation is the movement of personnel, equipment and supplies of an organization so they can respond to a non combat (i.e. natural disaster) event requiring special and immediate action.

Enriched Uranium—Uranium containing more uranium-235 than 0.72%.

Exclusive Use— (Also referred to in other publications as "sole use" or "full load.") The sole use of a conveyance by a single consignor for which all initial, intermediate, and final loading and unloading are carried out according to the direction of the consignor or consignee. Specific instructions for maintaining exclusive use shipment controls must be issued in writing and included with the shipping paper information provided to the carrier by the consignor.

Exempt Specimens—These include "Exempt Human Specimens" and "Exempt Animal Specimens" and are defined under Patient Specimens.

Filling Density—Designates the percent ratio of the weight of gas in a container to the weight of water that the container will hold at 16 degrees C (60 degrees F) (one pound of water equals 27.737 cubic inches at 16 degrees C).

Fissile Material—Any material consisting of or containing one or more fissile radionuclides. Fissile radionuclides are plutonium-239, plutonium-241, uranium-233, and uranium-235. Neither natural nor depleted uranium are fissile material. Fissile materials are classified according to the controls needed to provide nuclear criticality safety during transportation, as provided in A4.2.6. Certain exclusions are provided in **Attachment 3**.

Flash Point—The minimum temperature at which a liquid within a test vessel gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. Flash points are determined by the testing prescribed in 49 CFR §173.120.

Freight Container—A reusable transportation conveyance designed and constructed to permit loading, lifting, and movement of consolidated air eligible packages in unit form. Includes internal slingable units (ISUs), quadruple containers (QUADCONS), military vans (MILVANS), and similar military and commercial unit load devices authorized for air transportation.

Fuel Cell Cartridge—An article that stores fuel for discharge into the fuel cell through a valve(s) that controls the discharge of fuel into the fuel cell.

Genetically Modified Microorganisms (GMMOs) and Genetically Modified Organisms (GMOs)—Microorganisms and organisms in which genetic material has been purposely altered through genetic engineering in a way that does not occur naturally. GMMOs or GMOs which do not meet the definition of toxic or infectious substances must be assigned to UN3245.

Graduated Dip-Stick—A device marked with lines for measuring that provide a positive means to accurately determine the level of fluid in a tank/container.

Gross Weight (Gross Mass):—1. Weight of a vehicle, fully equipped and serviced for operation, including the weight of the fuel, lubricants, coolant, vehicle tools and spares, crew, personal equipment, and load.

2. Weight of a container, packaging or pallet including freight (contents) and binding.

Handlers—Personnel who only handle hazardous materials or hazardous materials documentation.

Hazard Class—The category of hazard assigned to a hazardous material based on defining criteria. Hazard classes are: explosives (Class 1), compressed gases (Class 2), flammable liquids (Class 3), flammable solids (Class 4), oxidizers and organic peroxides (Class 5), poisons and infectious substances (etiologic agents) (Class 6), radioactive materials (Class 7), corrosive materials (Class 8), and miscellaneous dangerous goods (Class 9).

Hazard Zone—One of four levels of hazard (hazard zones A through D) assigned to gases and one of two levels of hazard (hazard zones A and B) assigned to liquids that are poisonous by inhalation. A hazard zone is based on the LC50 value for acute inhalation toxicity of gases and vapors.

Hazardous Materials Inspectors— DOD personnel whose duties require them to review the integrity of the packaging and accuracy of documentation for all hazardous materials being transported within the Defense Transportation System (DTS) or by commercial carriers.

Hazardous Materials Preparers— DOD personnel whose duties require them to sign legally binding documentation certifying that hazardous materials are properly classified, packaged, marked and labeled, and in all respects meet the legal requirements for transportation within the DTS or by commercial carriers.

Hazardous Materials—A substance or material that is capable of posing an unreasonable risk to health, safety, and property when transported and has been so designated by this manual. May also be referred to as hazardous cargo. Term is synonymous with Dangerous Goods. ***NOTE:*** For identification, listing and rules pertaining to hazardous WASTE, refer to Title 40 CFR Parts 260-265, *Protection of Environment*, established by the U.S. Environmental Protection Agency (EPA).

Hazardous Substance—A material, including its mixtures and solutions, that meets ALL of the following conditions:

1. Listed in **Table A4.3** as originated in 49 CFR §172.101, Appendix A, Table 1, or a radionuclide listed in 49 CFR §172.101, Appendix A, Table 2.

2. In a quantity, in one package, which equals or exceeds the reportable quantity (RQ) listed in **Table A4.3**.

3. When in a mixture or solution:

3.1. For radionuclides, conforms to paragraph 7 of 49 CFR §172.101, Appendix A.

3.2. For other than radio nuclides, is in a concentration by weight which equals or exceeds the concentration corresponding to the RQ of the material shown in the following table:

Table A1.1. Quantity Required To Be a Hazardous Substance Mixture or Solution.

RQ	RQ	Concentration by	Weight
Pounds	Kilograms	Percent	PPM
5,000	2270	10	100,000
1,000	454	2	20,000
100	45.4	0.2	2,000
10	4.54	0.02	200
1	0.454	0.002	20

Hazardous Waste—Any material that is subject to the hazardous waste MANIFEST requirements of the EPA specified in 40 CFR Part 262.

Highway Route Controlled Quantity for Radioactive Material—A quantity within a single package that is over 3,000 times the A_1 (Special Form) or A_2 (Normal Form) value of the radionuclides specified in A11.3.; or over 1000 TBq (27,000 Ci), whichever is least.

Inert Solid—A solid that does not damage the thermal stability or increase the hazard of the organic peroxide.

Infectious substances—See Class 6.2

Inhabited Building Distance (IBD)—Distance in feet to be maintained between a potential explosion site and an inhabited building.

Inhalation Toxicity—1. A dust or mist with a lethal concentration where 50 percent of the test subjects die (LC_{50}) from acute toxicity on inhalation of not more than 4 mg/L.

2. A material with a saturated vapor concentration in air at 20 degrees C (68 degrees F) of more than one-fifth of the LC_{50} acute toxicity on inhalation of vapors and with an LC_{50} for acute toxicity on inhalation of vapors of not more than 5000 mL/m3 (5000 parts per million (PPM)).

3. An irritating material, with properties similar to tear gas which causes extreme irritation, especially in confined spaces.

Inner Packaging—Packaging for which an outer packaging is required for transport. It does not include the inner receptacle of a composite packaging.

Inner Receptacle—Receptacle which requires an outer packaging in order to perform its containment function. The inner receptacle may be an inner packaging of a combination packaging or the inner receptacle of a composite packaging.

Jerrican—A metal or plastic packaging of rectangular or polygonal cross-section.

Kit—A set of materials or articles used for a specific purpose, shipped as a single item and assigned a single National Stock Number or Part Number by the Service/Agency Item Manager. A kit may include one or more different hazardous materials. Hazardous components may or may not be compatible but may be transported together as a kit.

Leakproof— designed to prevent any of the contents of material from escaping or anything unwanted from entering. May indicate ability to pass the leakproofness test required by 49 CFR §178.604.

Leak-tight— See leakproof

Limited Quantity of Radioactive Materials—A quantity of radioactive material which is not over the limits and conforms to the requirements specified in A11.5.

Liquefied Compressed Gas—A gas, which under charged pressure, is partially liquid at a temperature of 20 degrees C (68 degrees F).

Low Specific Activity (LSA) Material— Radioactive material, which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply, is termed Low Specific Activity, or LSA material. External shielding material surrounding the LSA material must not be considered in determining the estimated average specific activity. LSA material is classed in one of three groups; LSA-I, LSA-II, and LSA-III (see **Attachment 3** for more information on these groups).

Low Dispersible Material— Either a solid radioactive material or a solid radioactive material in a sealed capsule that has limited dispensability and is not in powder form.

Magnetic Material—Any packaged material that has a magnetic field strength of 0.002 gauss or more measured at 2.1 m (7 ft) from any surface of the package.

Metal Hydride Storage System—A single complete hydrogen storage system that includes a receptacle, metal hydride, pressure relief device, shut-off valve, service equipment and internal components used for the transportation of hydrogen only.

Multiple-Element Gas Container (MEGC)— Assemblies of DOT Specification and UN approved cylinders, tubes, or bundles of cylinders, interconnected by a manifold and assembled within a framework.

Natural Thorium—Thorium with the naturally occurring distribution of thorium isotopes (essentially 100 weight percent thorium-232).

Natural Uranium—Uranium containing the naturally occurring distribution of uranium isotopes (approximately 99.28% uranium-238 and 0.72% ranium-235 by mass).

Net Explosive Weight (NEW)—As it relates to this manual, NEW is the total weight, expressed in kilograms, of all explosive components. Refer to DOD 6055.9-M, *Explosive Safety Standards* or Service directives for definition of NEW used to determine Quantity Distance (QD) criteria.

Net Mass—The weight of the contents in a single packaging.

Non-Bulk Packaging—A packaging that has a maximum net mass of 400 kg (882 lbs) or less and a maximum capacity of 450 L (119 gallons) or less or a water capacity of 454 kg (1000 lbs) or less as a receptacle for a gas.

Nonfixed Radioactive Contamination—Radioactive contamination that can be readily removed from a surface by wiping with an absorbent material. Nonfixed (removable) radioactive contamination is not significant if it is not over the limits specified in A3.3.7.9.

Nonliquefied Compressed Gas—A gas, other than gas in solution, which under charged pressure is entirely gaseous at a temperature of 20 degrees C (68 degrees F).

Normal Form Radioactive Material—Radioactive material that has not been demonstrated to qualify as "special form radioactive material."

Oral Toxicity—Liquid with a lethal dose where 50 percent of the test subjects die (LD50) from acute oral toxicity of not more than 500 mg/kg or a solid with an LD50 for acute oral toxicity of not more than 200 mg/kg.

ORM-D—For the purposes of this manual, ORM-D material, are only those materials that present a limited hazard during transportation due to their form, quantity, and packaging (e.g., Consumer Commodity). Each ORM-D material is listed in **Table A4.1**. ORM-D classification is only authorized for domestic shipments. International shipments must not be transported under the classification "ORM-D."

Other Form (radioactive material)— Radioactive material that does not meet the definition of Special Form radioactive material.

Outage or Ullage—The amount a packaging falls short of being liquid full, usually expressed in percent by volume.

Outer Packaging—The outermost enclosure of a composite or combination packaging together with any absorbent materials, cushioning, and any other components necessary to contain and protect the inner receptacles or inner packagings.

Overpack— 1) A container or enclosure used to hold one or more air eligible packages to form a single unit for convenience of handling or storage during transportation. Freight containers are not considered overpacks. 2) Placement of containers that do not meet air eligibility pressure requirements into an outer approved UN packaging.

Oxidizing Gas—A gas that may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. Specifically, this means a pure gas or gas mixture with an oxidizing power greater than 23.5% as determined by a method specified in ISO 10156: or 10156–2.

Package—For radioactive materials, the packaging together with its radioactive contents as presented for transport.

Package or Outside Package—The packaging plus its contents.

Packaging(s)—A receptacle and any other components or materials necessary for the receptacle to perform its containment function in conformance with the minimum packing requirements of this manual. For radioactive materials, the assembly of components necessary to ensure compliance with the packaging requirements of this manual. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, and devices for cooling or absorbing mechanical shocks. The conveyance, tie down system, and auxiliary equipment may sometimes be designated as part of the packaging.

Packers—Personnel who package hazardous materials, but do not sign legally binding documents.

Packing Group—The degree of danger presented by the hazardous material.

1. Packing Group I indicates great danger.

2. Packing Group II indicates medium danger.

3. Packing Group III indicates minor danger.

Participant— Unit-move personnel directly attached to and moving with a deploying unit and their associated cargo as part of a tactical, contingency, or emergency operation or an exercise. Also, may be applied to non-channel airlift missions (e.g. Special Assignment Airlift Missions (SAAM) providing an exclusive service for movement of unit personnel and their associated cargo). Non-unit personnel are considered passengers.

Patient Specimens— Any human or animal material, including excreta, secreta, blood and its components, tissue, and tissue fluids being transported for diagnostic or investigational purposes, which have a minimal likelihood of containing pathogens in Category A or B. In determining whether a patient specimen has a minimal likelihood that pathogens are present, an element of professional judgment is required and determination made based upon the known medical history, symptoms, and individual circumstances of the source human or animal, and endemic local conditions. Generally, these include samples being tested for other than the presence of a pathogen. Examples are cholesterol tests, drug tests, pregnancy.

Polymerizable Material—Any material that may polymerize (combine or react with itself) with an evolution of a dangerous quantity of heat or gas.

Pounds Per Square Inch (PSI)—The amount of force exerted on one square inch of the container or cylinder wall.

Pounds Per Square Inch Absolute (PSIA)—The absolute value of the force exerted on the container or cylinder wall. Absolute pressure is atmospheric pressure plus gauge pressure.

Pounds Per Square Inch Gauge (PSIG)—The gauge pressure is the pressure taken by a pressure gauge that represents the force exerted within the container or cylinder. Gauge pressure is always that pressure above atmospheric pressure.

Purged—As it relates to this manual, purged means void of hazardous material. Removal of liquid hazardous material by physical, chemical, or mechanical means as directed by a technical publication or directive. In the absence of a specific technical procedure, it is the shipper's determination based on the specific knowledge of the item to decide the appropriate preparation to ensure the item is void of hazardous material.

Primary Hazard—The hazard class of the material as assigned by **Table A4.1**.

Pyrophoric Material—This material is a liquid or solid that, even in small quantities and without an external ignition source, can ignite within five minutes of coming in contact with air. This material is the most likely to spontaneously combust.

Radiation Level—The radiation dose-equivalent rate expressed in millisievert per hour or mSv/h (millirem per hour or mrem/h). Neutron flux densities may be converted into radiation levels according to 49 CFR §173.403 (v).

Radioactive Instrument or Article—Any manufactured instrument or article such as clock, electronic tube or apparatus, or a similar instrument or article having radioactive material in gaseous or non-dispersible solid form as a component part.

Radioactive Contents—The radioactive material, together with any contaminated or activated solids, liquids or gases, within the package.

Radioactive Material— Any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values in **Table 11.1**.

Receptacle—A containment vessel for receiving and holding materials, including any means of closing.

Refrigerant Gas (Dispersant Gas)—This term applies to all flammable, nonflammable, nonpoisonous refrigerant gases, dispersant gases (fluorocarbons), or mixtures listed in **Table A4.1**; or any other compressed gas meeting one of the following conditions:

1. A nonflammable mixture containing not less than 50 percent fluorocarbon content, having a vapor pressure not over 1792 kPa (260 psig) at 54 degrees C (130 degrees F).

2. A flammable mixture containing not less than 50 percent fluorocarbon content, not over 40 percent by weight of a flammable component, having a vapor pressure not over 1792 kPa (260 psig) at 54 degrees C (130 degrees F).

Regulated Medical Waste— Wastes derived from medicinal treatment of humans or animals or from bio-research, where there is low probability that infectious substances are present. Regulated medical waste known to contain an infectious substance in Category A must be classed as Division 6.2, described as an infectious substance, and assigned to UN2814 or UN2900, as appropriate. Also known as Biomedical Waste, Clinical Waste, Medical Waste.

Reportable Quantity—The quantity of material, as set forth in 40 CFR §302.4, the release of which requires notification pursuant to 40 CFR Part 302. See also "Hazardous Substance."

Residue—The hazardous material remaining in a packaging after its contents have been removed to the maximum extent possible and before the packaging has been purged to remove any hazardous vapors.

Sealed Source—Radioactive source in a bonded cover, which prevents contact with and dispersion of the radioactive material under the conditions of use and wear for which it was designed.

Secondary Hazard—A distinct and separate hazardous item that is a component or integral part of a larger item that is considered the primary hazard.

Secondary Load—A distinct and separate hazardous item (other than a secondary hazard) that is loaded and transported by a vehicle or on SE. May also be referred to as an accompanying load.

Self-Heating Material—Is a material that generates heat through a process of the gradual reaction of that substance with oxygen (in air). If the rate of heat production exceeds the rate of heat loss, then the temperature of the substance will rise which, after an induction time, may lead to self-ignition and combustion.

Self-Reactive Material—At normal or elevated temperatures, this material is liable to undergo a strong exothermic reaction. Exothermic reaction can be caused by excessively high transport temperatures or by contamination.

Service Pressure—This term refers to the authorized pressure marking on the container. For example, for a cylinder marked "DOT 3A1800" the service pressure is 12410 kPa (1800 psi).

Sharps—Any object contaminated with a pathogen or that may become contaminated with a pathogen through handling or during transportation and also capable of cutting or penetrating

skin or a packaging material. Sharps includes needles, syringes, scalpels, broken glass, culture slides, culture dishes, broken capillary tubes, broken rigid plastic, and exposed ends of dental wires. Sharps are assigned the proper shipping name of Regulated Medical Waste.

Shipping Activity—Unit, organization, or activity that originally offers a hazardous material into the Defense Transportation System.

Shipping Paper—The Air Cargo Manifest which includes minimum hazardous material information as required by DTR 4500.9-R. In the absence of an Air Cargo Manifest, the Shipper's Declaration for Dangerous Goods form may serve as a shipping paper.

Siftproof— A packaging impermeable to dry contents, including fine solid material produced during transportation.

Single Packaging—Nonbulk packaging other than a combination or composite packaging.

Sievert (Sv)—The standard unit of measure for radiation dose-equivalent. It is represented by the symbol "Sv." The sievert replaces the older unit for dose-equivalent, the "rem." One Sv is equal to 100 rem.

Special Approvals—An authorization issued by the appropriate authority for transport of certain hazardous materials. These approvals may be a Department of Transportation Special Permits (DOT-SPs), Competent Authority Approval (CAA), or a Certification of Equivalency (COE).

Special Form Radioactive Material—A single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule; has at least one dimension not less than 5 millimeters (0.197 inch); and meets the requirements of 49 CFR §173.469.

Specific Activity of a Radionuclide—The activity of the radionuclide per unit mass of that nuclide. The specific activity of a material in which the radionuclide is essentially uniformly distributed is the activity per unit mass of the material.

Stabilized— The substance is in a condition that precludes uncontrolled reaction. This may be achieved by methods such as addition of an inhibiting chemical, degassing the substance to remove dissolved oxygen and inerting the air space in the package, or maintaining the substance under temperature control.

Strategic Airlift— A military mission to move personnel, equipment and supplies of an organization in support of United States' military objectives and interests, including supporting multi-national missions or alliances.

Strong Outer Packaging— The outermost enclosure that provides protection against the unintentional release of its contents under normal conditions of transportation, to include rough handling.

Subsidiary Risk— An additional hazardous property of a material other than the primary hazard as identified in **Table A4.1**.

Surface Contaminated Object (SCO)— Surface Contaminated Object (SCO) means a solid object which is not itself radioactive but which has radioactive material distributed on its surfaces. SCO is classified in one of two groups: SCO-I and SCO-II. See **Attachment 3** for more information.

Tactical—A tactical operation is the movement of personnel, equipment and supplies of an organization so they can accomplish their immediate military combat objective.

Technical Name—A recognized chemical name or micro biological name currently used in scientific and technical handbooks, journals, and texts. Generic descriptions are authorized provided they readily identify the general chemical or micro biological group.

Toxin—A Division 6.1 material from a plant, animal, or bacterial source. A toxin containing an infectious substance or a toxin contained in an infectious substance must be classed as Division 6.2, described as an infectious substance, and assigned to UN2814 or UN2900, as appropriate.

Transport Index—A single number assigned to a package, overpack, or freight container to provide control over radiation exposure. The transportation index is the radiation level at 1 meter from the outer surface of a package.

Type A Package—A type A packaging (see definition for type A packaging) together with its limited radioactive contents. A type A package does not require competent authority approval since its contents are limited to A_1 or A_2.

Type A Packaging—A packaging designed to retain the integrity of containment and shielding required by this manual under normal conditions of transport, as demonstrated by the tests set forth in 49 CFR §173.465 or §173.466.

Type B (M) Package—A type B packaging (see definition for type B packaging), together with its radioactive contents, that for international shipments requires multilateral approval of the package design and may require approval of the conditions of shipment. Type B(M) packages are those type B package designs that have a maximum normal operating pressure of more than 7 kg/cm^2 (100 $pounds/in^2$ gauge) or a relief device that allows the release of radioactive material to the environment under the hypothetical accident conditions specified in 10 CFR Part 71.

Type B (U) Package—A type B packaging (see definition for type B packaging), together with its radioactive contents, that for international shipments requires unilateral approval only of the package design and of any stowage provisions that may be necessary for heat dissipation.

Type B Package—A type B packaging (see definition for type B packaging) together with its radioactive contents is designed to transport greater than an A_1 or A_2 quantity of radioactive material.

Type B Packaging—Is a packaging designed to retain the integrity of containment and shielding required when subjected to the normal conditions of transport and hypothetical accident test conditions set forth in 10 CFR Part 71.

Uncompressed Gas—For the purposes of this manual, gas at a pressure not exceeding the ambient atmospheric pressure at the time and location the containment system is closed. All other radioactive gases are considered to be compressed.

Unirradiated Thorium—Thorium containing not more than 10^{-7} grams uranium-233 per gram of thorium-232.

Unirradiated Uranium—Uranium containing not more than 2×10^3Bq of plutonium per gram of uranium-235 , not more than 9×10^6Bq of fission products per gram of uranium-235 and more than 5×10^{-3} g of uranium-236 per gram of uranium-235.

UN Pressure Receptacle— A UN cylinder or tube.

Used Health Care Product— A medical, diagnostic, or research device or piece of equipment or a personal care product contaminated with potentially infectious body fluids or materials other than a Category A infectious substance.

Vehicle—Any device or conveyance used for carrying or transporting passengers, equipment, or cargo. Includes, but not limited to automobiles, trucks, motorcycles, aircraft, boats, etc.

Waterproof—Impervious to water; constructed to be impermeable, impenetrable, and unaffected by water.

Water resistant— having a degree of resistance to permeability by and damage caused by water in liquid form.

Watertight—See waterproof

Wetted Explosive—This material, when dry, is a Class 1 material other than those of compatibility group A. Items in compatibility group A have been wetted with sufficient water, alcohol, or plasticizer to suppress explosive properties. Wetted explosives also includes items specifically authorized by name in **Table A4.1** or which have been assigned a PSN and hazard class by the DOT.

Attachment 2

STEPS FOR PREPARING HAZARDOUS MATERIAL

Use the following illustration as a guide for preparing hazardous materials for military air shipment.

Table A2.1. STEPS FOR PREPARING HAZARDOUS MATERIAL.

STEP 1 -- TRAINING		1.1. Ensure you are properly trained and qualified according to paragraph 1.3 and Attachment 25. 1.2. If a Preparer, ensure compliance with paragraph 1.2.4. for authorization to certify.
STEP 2 -- IDENTIFY MATERIAL		2.1. Determine if material is hazardous and appropriate hazard classification by utilizing: 2.1.1. Hazardous Material Information Resource System (HMIRS) 2.1.2. Product Material Safety Data Sheets (MSDS) 2.1.3. Manufacturers Information 2.1.4. Joint Hazardous Classification System (JHCS) or Service Technical Directives
STEP 3 -- DETERMINE PROPER SHIPPING NAME (PSN)		3.1. See Table A4.1. for listing of PSNs. 3.2. Determine whether item is “forbidden.” If so, the item may not be shipped via military airlift. 3.3. Also listed with PSN is the hazard class, UN number, packaging group (PG), special provisions, and packaging paragraph(s). 3.4. Determine whether a technical name is required. 3.5. Determine passenger eligibility. 3.6. Determine whether item is a “Hazardous Substance” according to Table A4.3
STEP 4 -- DETERMINE REQUIREMENT FOR Chapter 3 AND NON-Chapter 3 MISSION (CHANNEL)		4.1. Non- Chapter 3 Airlift, See Chapter 1 & 2 for general requirements that cover all hazardous materials shipments by military airlift. Chapter 2 covers deviations, waivers, and special requirements. 4.2. Chapter 3 Operations, See Chapter 3 for exceptions.
STEP 5 -- PACKAGE ITEM		5.1. Package or prepare the item for airlift. Use, as applicable: 5.1.1. DOD POP program 5.1.2. Special Packaging Instruction (SPI) or drawing 5.1.3. Technical order, directive or field manual 5.1.4. Manufacturer or vendor packaging 5.1.5. Technical Training 5.2. If already packaged, go to step 6

STEP 6 -- VERIFY PACKAGING IS ACCEPTABLE		6.1. Review the paragraph listed in Table A4.1 to determine if it describes the hazardous material as packaged or prepared. 6.2. Determine whether special provisions apply. 6.3. Review Attachment 3 to determine if package is air eligible and for general packaging requirements. 6.4. Ensure UN specification packaging requirements are met, if applicable. 6.5. Review Attachment 19 for "Excepted" and "Limited Quantity" exceptions. 6.6. Ensure absorbent cushioning requirements found in Attachment 20 are met, if applicable. 6.7. Determine if vehicle and equipment fuel levels are acceptable.
STEP 7 -- MARK AND LABEL PACKAGE		7.1. Mark container IAW Attachment 14. 7.2. Review general marking requirements. 7.3. Review hazard class specific marking requirements. 7.4. Label container IAW Attachment 15. Subsidiary labels are listed in column 6 of Table A4.1. 7.5. Review general labeling requirements. 7.6. Review handling label requirements
STEP 8 -- COMPLETE HAZARDOUS MATERIAL CERTIFICATION		8.1. Certify shipment in accordance with Attachment 17. 8.2. Review hazard class specific requirements. 8.3. Review exceptions for Chapter 3 operations. 8.4. Samples of shipper's declarations are included in Attachment 17 for reference.
STEP 9 -- COMPATIBILITY REQUIREMENTS		9.1. Ensure material is compatible IAW Attachment 18. 9.2. Table A18.1 details segregation requirements for all hazardous material 9.3. Table A18.2. specifies compatibility requirements for Class 1 9.4. Review exceptions for Chapter 3 operations.
STEP 10 -- BRIEFING AGENCY REQUIREMENTS		10.1. Attachment 21 details information required to be briefed to the aircraft commander (or designated representative)

Attachment 3

GENERAL AND HAZARD CLASS SPECIFIC AIR TRANSPORTATION REQUIREMENTS

A3.1. General Packaging Requirements. The general requirements of **Attachment 3** are in addition to the specific packaging requirements outlined in **Attachment 5** through **Attachment 13**. Hazardous material packaging must be authorized by this manual, 49 CFR Part 173, ICAO, or IATA, and meet the requirements outlined in this attachment. Specific requirements contained in a technical directive governing the packaging or preparation of an item, commodity, or article, must be complied with when stricter than requirements in this manual.

A3.1.1. United Nations (UN) Performance Specification Packaging. Prepare hazardous materials in UN specification containers unless exempted by a specific packaging paragraph in this manual. DOD activities use the DOD POP Program to locate tested and authorized DOD packaging configurations. If the hazardous material is procured in a manufacturer's UN specification container, use that container. Ensure compliance with all other requirements of this manual, including air-eligibility. If the managing activity has specified a container SPI, use that UN specification container. For additional information concerning UN specification packaging or performance test requirements see DLAD 4145.41/AR 700-143/AFI 24-210_IP/NAVSUPINST 4030.55/MCO 4030.40A, *Packaging of Hazardous Material.* Service focal points are unable to waive UN specification requirements.

A3.1.1.1. Exempt Items. The following materials are exempt from UN performance specification packaging test requirements. The packaging paragraph from **Table A4.1** will specify required packaging. While UN specification packaging is not required, material may be subject to package performance tests.

A3.1.1.1.1. Compressed gas cylinders

A3.1.1.1.2. Radioactive material

A3.1.1.1.3. Dry ice

A3.1.1.1.4. Magnetized material

A3.1.1.1.5. Life-saving appliances

A3.1.1.1.6. Mercury contained in manufactured articles

A3.1.1.1.7. Items identified in this manual as requiring "strong outer packaging"

A3.1.1.1.8. Limited and Excepted Quantities.

A3.1.1.1.9. Biological Substances, Category B.

A3.1.1.1.10. Packages whose net mass exceeds 400 kg (882 pounds) or with a capacity exceeding 450 liters (119 gallons).

A3.1.2. Transportability. Securely close and construct containers to prevent leakage due to changes in temperature, humidity, altitude, and damage during transportation and in-transit handling. Hazardous materials must be packaged/prepared according to one of the following: DoD Performance Oriented Packaging (POP) Program, DOD SPI or an approved service drawing, technical publication (e.g., technical order/manual), manufacturer's supplied

closing instructions, UN specification test report, or technical knowledge/training to construct strong outer packaging when required by this manual.

A3.1.2.1. Primary and secondary items and their containers (unit or exterior) must provide protection without deformation, leakage, or rupture against:

A3.1.2.1.1. Temperature changes (-40 to 65.5 degrees C [-40 to +150 degrees F]).

A3.1.2.1.2. Pressure changes due to altitude changes (sea level to 3.7 km (12,000 feet)).

A3.1.2.1.3. Pressure changes due to explosive decompression from 3.7 to 15.24 km (12,000 to 50,000 feet).

A3.1.2.2. Do not fill a UN specification packaging to a gross mass greater than the authorized gross mass marked on the packaging.

A3.1.2.3. Provide adequate protection for material susceptible to damage by freezing during both ground and air operations.

A3.1.3. Compatibility. All containers must be designed and constructed of materials that do not react with, or are not decomposed by, the material contained therein. Plastic containers or liners must prevent permeation of contents. Plastic packaging or receptacles used for liquid hazardous materials must be capable of withstanding, without failure, the test specified in 49 CFR Part 173, Appendix B, *Procedure for Testing Chemical Compatibility and Rate of Permeation in Plastic Packagings and Receptacles.*

A3.1.4. Leak Containment (Liner) General Requirements. Leak containment must be provided for hazardous liquids when required outer packaging is not liquid-tight. This does not apply to overpacks used only for air shipment consolidation. Use a leak-proof liner, plastic bag, or other equally efficient means of containment specified in packaging or closure instructions according to A3.1.2. Items drained and purged that are susceptible to leaking purging fluid (e.g. small fuel components) will also be contained in a liner to prevent leaking.

A3.1.5. Ullage (Outage). Do not entirely fill containers designed to hold liquids. When filling packagings with liquid hazardous material, leave sufficient interior space (outage) to prevent leakage of contents or distortion of containers due to change of temperature during transportation, storage, and handling. For flammable liquids and other volatile liquids with a high coefficient of expansion, a minimum outage of 2 percent at 54 degrees C (130 degrees F), is required.

A3.1.6. Closures. Packages and containers must be closed as specified in a test report, packaging instruction, or drawing except as identified in A28.2.2. When used, stoppers, corks, or other such friction-type closures must be held in place securely, tightly, and effectively. Each screw-type closure on any packaging/container (other than UN specification jerricans) containing a hazardous liquid must be secured with pressure-sensitive tape, self-shrinking plastic, wire, a device designed to prevent the cap from loosening (integral locking cap), or other positive means to prevent the closure from loosening due to vibration or substantial temperature change.

A3.1.7. Air-Eligible Packaging Requirements.

A3.1.7.1. Combination Packaging Pressure Standard. Inner packagings (including closures) used to retain a hazardous liquid or semi-solid in a combination packaging must be capable of withstanding (without leaking) an internal air gauge pressure of not less than 95 kPa (14 psi); or 75 kPa (11 psi) for Packing Group III liquids in Class 3 or Class 6.1; or a pressure related to the vapor pressure of the liquid contained in the receptacle, whichever is greater. Repack or overpack liquid hazardous materials in containers that do not meet the internal hydraulic pressure standard, into UN certified specification containers that meet this requirement. Determine the pressure related to the vapor pressure of the liquid by one of the following methods:

A3.1.7.1.1. The total gauge pressure measured in the receptacle (that is, the vapor pressure of the liquid and the partial pressure of the air, or other inert gases, less 100 kPa (15 psi) at 55 degrees C (131 degrees F), multiplied by a safety factor of 1.5. The total gauge pressure is determined on the basis of a filling temperature of 15 degrees C (59 degrees F) and a degree of filling such that the receptacle is not liquid full at a temperature of 55 degrees C (131 degrees F).

A3.1.7.1.2. Not less than 1.75 times the vapor pressure at 50 degrees C (122 degrees F) of the material to be transported minus 100 kPa (15 psi) but with a minimum test pressure of 100 kPa (15 psi).

A3.1.7.1.3. Not less than 1.5 times the vapor pressure at 55 degrees C (131 degrees F) of the material to be transported minus 100 kPa (15 psi) but with a minimum test pressure of 100 kPa (15 psi).

A3.1.7.2. Single and Composite Packaging Pressure Requirement. Single packagings containing liquid hazardous material must meet the hydraulic pressure test requirements of 49 CFR §178.605. A test pressure of not less than 250 kPa (36 psi) for liquids of PG I; 80 kPa (12 psi) for PG III liquids in Class 3 or Class 6.1; and 100 kPa (15 psi) for all other liquids is required. If shipping liquid hazardous materials in containers that do not meet the internal hydraulic pressure requirement, repack or overpack into UN specification certified containers that do meet the requirement.

A3.1.7.3. Overpacking Containers. Pack containers holding liquids that do not meet the pressure requirement for air transport into an outer container that does meet the requirement. Separate interior containers by absorbent cushioning material as required by **Attachment 20**. Do not overpack pressurized containers in sealed metal drums. See **Attachment 14** and **Attachment 15** for marking/labeling requirements and **Table A17.1** for certification instructions.

A3.1.8. Indicators. Valves and indicators (with protective caps when required), which are necessary to ensure safe transportation, must be installed in the shipping container. Examples are relief valves (vacuum or pressure), humidity indicators, or leak indicators with adequate sensitivity to alert monitor or crew of imminent danger.

A3.1.9. Packaging for certain Class/Divisions. A packaging containing a Packing Group III material with a primary or subsidiary risk of Class/Division 4.1, 4.2, 4.3, 5.1, or 8 must meet Packing Group II performance level.

A3.1.10. Inner Packaging. Pack, secure, and cushion inner packagings of combination packagings to prevent breakage or leakage and to control movement within the outer

container. When partial contents are removed, fill voids to ensure a tight pack. Cushioning material must not react dangerously with the contents of the inner packagings. Inner packagings are required as specified by the applicable packaging paragraph. If inner packagings are not required, the packaging paragraph will state that inner packagings are not necessary. See **Attachment 20** for absorbent cushioning requirements.

A3.1.11. Outside Package/Container. The package or container must be of such size that there is adequate space to affix all markings and labels in a manner required by this manual (**Attachment 14** and **Attachment 15**). If necessary, use overpacks to provide adequate space.

A3.1.12. Solids in a Liquid Single Packaging. A single or composite packaging which is tested and marked for liquid hazardous materials may be filled with a solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked. In addition:

A3.1.12.1. A single or composite packaging which is tested and marked for PG I liquid hazardous materials may be filled with:

A3.1.12.1.1. A PG II solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 1.5, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked; or

A3.1.12.1.2. A PG III solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 2.25, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked.

A3.1.12.2. A single or composite packaging which is tested and marked for PG II liquid hazardous materials may be filled with a PG III solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 1.5, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked.

A3.1.13. Quantity limits for UN specification Nonbulk Packagings. Unless otherwise specified, the maximum capacity of allowed in a UN Specification packaging is expressed in the following table.

Table A3.1. Quantity limits for UN specification Nonbulk Packagings.

Packaging Type	Type Code	Maximum Capacity / Net Mass
Steel Drum	1A1, 1A2	450 L (119 gal) / 400 kg (882 lb)
Aluminum Drum	1B1, 1B2	450 L (119 gal) / 400 kg (882 lb)
Metal Drum (other than steel or aluminum)	1N1, 1N2	450 L (119 gal) / 400 kg (882 lb)
Plywood Drum	1D	250 L (66 gal) / 400 kg (882 lb)
Fiber Drum	1G	450 L (119 gal) / 400 kg (882 lb)

Packaging Type	Type Code	Maximum Capacity / Net Mass
Plastic Drum	1H1, 1H2	450 L (119 gal) / 400 kg (882 lb)
Wooden Barrel	2C1, 2C2	250 L (66 gal) / 400 kg (882 lb)
Plastic Jerrican	3H1, 3H2	60 L (16 gal) / 120 kg (265 lb)
Aluminum and Steel Jerrican	3A1, 3A2, 3B1, 3B2	60 L (16 gal) / 120 kg (265 lb)
Aluminum and Steel Box	4A, 4B	400 kg (882 lb)
Wood Box – Natural Wood, Plywood, and Reconstituted Wood	4C1, 4C2, 4D, 4F	400 kg (882 lb)
Fiberboard Box	4G	400 kg (882 lb)
Plastic Box	4H1	60 kg (132 lb)
	4H2	400 kg (882 lb)
Bags – Woven Plastic, Plastic Film, Textile, and Paper	5H1, 5H2, 5H3, 5H4, 5L1, 5L2, 5L3, 5M1, 5M2	50 kg (110 lb)
Composite Packaging with inner plastic receptacle and outer drum	6HA1, 6HB1, 6HD1, 6HG1, 6HH1	250 L (66 gal) / 400 kg (882 lb)
Composite Packaging with inner plastic receptacle and outer box	6HA2, 6HB2, 6HC, 6HD2, 6HG2, 6HH2	60 L (16 gal) / 75 kg (165 lb)
Composite Packaging with inner glass porcelain or stoneware receptacles	6PA1, 6PA2, 6PB1, 6PB2, 6PC, 6PD1, 6PD2, 6PG1, 6PG2, 6PH1, 6PH2	60 L (16 gal) / 75 kg (165 lb)

A3.1.14. Plastics Drums and Jerricans. The period of use permitted for the transport of a hazardous material in plastics drums and jerricans is five years from the date of manufacture of the receptacles except for re-usable containers which are marked with the minimum thickness of the packaging material according to 49 CFR §173.28.

A3.1.15. Foreign Packaging. UN standard non-bulk packaging manufactured outside the United States may be shipped by military air provided packages are marked according to A14.2, when applicable, and all other requirements of this manual are complied with. Refer to A3.3.2.10. for shipping of foreign cylinders.

A3.1.16. Empty Packagings, (articles, Fuel Tanks, Containers, Cylinders, Radioactive Packages and Nonhazardous Materials). Except as specified in this paragraph, empty packagings are not subject to any other requirements of this manual.

A3.1.16.1. Empty Containers. Inspect packages that formerly contained a hazardous material covered by this manual to determine the presence or absence of hazardous material. If there is presence of hazardous material, purge the hazardous material or the package is regulated in the same manner as prescribed for the package when it was full. A container is considered empty if:

A3.1.16.1.1. A hazardous article has been removed from its container and there is no possibility of remaining residue (i.e., empty torpedo or missile containers).

A3.1.16.1.2. The container has been purged of the hazardous material it previously contained. ***Note:*** When purging equipment/facilities are not present at a given location, items must be properly packaged and certified as hazardous materials.

A3.1.16.2. Empty Cylinders. Compressed gas cylinders are empty if the pressure in the cylinder is less than 40 pounds per square inch absolute (psia) at 21 degrees C (70 degrees F). Psia equals the gauge pressure plus atmospheric pressure (14.7 psi).

A3.1.16.2.1. Before shipment, inspect empty cylinders for dents, bulges, oxidation pits, or other damage. Handle faulty cylinders as required by the latest DOT regulations or DLAI 4145.25/A700-68/NAVSUPINST 4440.128D/MCO 10330.2D/AFMAN 23-227(I), *Storage and Handling of Liquefied and Gaseous Compressed Gasses and Their Full and Empty Cylinders.*

A3.1.16.2.2. Tightly close valves of cylinders before offering for transportation. The requirements of A3.3.2.3. apply to the protection of the valves.

A3.1.16.2.3. If the cylinder contains residue of the following material, ship regulated as full cylinders, regardless of psia, unless completely cleaned and purged of residue or vapors:

A3.1.16.2.3.1. Ammonia, Anhydrous

A3.1.16.2.3.2. Division 2.2 with a subsidiary risk (other than division 5.1)

A3.1.16.2.3.3. Contains a flammable or poisonous material

A3.1.16.3. Empty Radioactive Material Packaging. Empty the contents of the packaging as far as practical, and ensure the requirements of 49 CFR §173.428 are met.

A3.1.16.4. Identifying Nonregulated Material, Containers or Cylinders. An item listed in **Table A4.1** may not be regulated because it does not meet the definition of the hazard class. This includes containers or articles defined as empty according to this paragraph. In this situation, when the item is determined to be nonregulated, the shipper must alert the carrier by:

A3.1.16.4.1. Annotating "NONHAZARDOUS" in the address block of the Military Shipment Label (MSL) and/or mark container “Non-Regulated”. In the absence of the MSL, the shipper will use an equivalent means of notification.

A3.1.16.4.2. Ship the item as general cargo and a Shipper's Declaration for Dangerous Goods form is not required.

A3.1.16.4.3. Apply an "EMPTY" label according to **Attachment 15**, when applicable. A label is not required for equipment or articles unless packaged, crated, or otherwise enclosed to prevent ready identification.

A3.1.16.4.4. The "NONHAZARDOUS" entry on the MSL and the use of an "EMPTY" label is not required when the hazardous contents are completely removed from the container and there is no possibility of remaining residue, and the hazard

communication markings and labels are removed or covered. Identify cylinders as empty as required by A15.3.4.

A3.1.17. Hidden Hazardous Shipment Indicators. Shippers have not always properly identified all hazardous materials prior to entering the DTS. The main reason is lack of knowledge of hazardous materials located or packed in equipment, toolboxes, parts, etc. Personnel that ship, inspect or handle cargo in DTS should be aware of potential hidden hazards. If hazards are suspected, frustrate the shipment and coordinate with the shipping activity to resolve. The following table has examples of cargo that could contain hidden hazards that may endanger the safety of aircraft.

Table A3.2. Hidden Hazardous Shipment Indicators.

Cargo Type	May Contain
Aircraft and Aircraft Parts	batteries, explosives, chemical oxygen generators, compressed gas cylinders (fire extinguishers)(oxygen bottles), fuel cells, fuel devices, radioactive material, secondary loads, survival kits
Breathing Apparatus/SCUBA	compressed air or compressed gasses including oxygen in cylinders
Cleaning supplies	solvents, flammable liquids, corrosive material
Containerized Loads	multiple hazards
Cryogenics: low temperature, low pressure, or non-pressurized gas	liquid argon, helium, nitrogen, oxygen
Cylinders	compressed gas
Deployment Equipment	batteries, flammable liquids, gas, or solids, fuel cells, lithium batteries, radioactive material
Electrical Equipment	batteries, lithium batteries, magnetized materials, mercury in switches or electron tubes, radioactive material
Frozen Foods	dry ice
Fuel Devices (e.g. NSN 2915013647174)	residual fuel (especially if used or unserviceable)
Generators, Engines and Ground SE	batteries, compressed gas cylinders (fire extinguishers), explosives, fuel cells, fuel devices
Household Products	paint, aerosols, bleach, radioactive material, etc.
Individual Equipment Items (GPS equipment, night vision devices, personal protection devices, sighting equipments, etc.)	aerosols, batteries, lithium batteries, flammable gas, radioactive materials
Instruments	batteries, lithium batteries, mercury, radioactive materials
Laboratory Samples	hazardous chemicals, infectious substances, radioactive material
Machinery Parts	adhesives, hazardous chemicals, paints, sealants, solvents
Medical Supplies/Equipment	batteries, lithium batteries, hazardous chemicals
Pharmaceuticals, Vaccines	dry ice, hazardous chemicals
Repair Kits	adhesives, hazardous chemicals, paints, solvents, organic peroxides

Survival Kits	aerosols, batteries, compressed gas, flammable solids, lithium batteries
Tool Boxes	adhesives, cleaners, compressed gas, lubricants, paints, sealers, solvents
Vehicles and Vehicle Parts	additional fuel, air bag inflators/air bag modules, batteries, fire extinguishers, fuel cells, fuel devices, paints, radioactive material, secondary loads, shocks/struts with compressed gas
Vessels and Vessel Parts	batteries, compressed gas cylinders (fire extinguishers)(SCUBA), explosives, flares, fuel cells, fuel devices, life rafts, secondary loads

A3.2. General Requirements Applicable to Specific Items.

A3.2.1. Meals Ready to Eat (MRE). Follow the requirements of **paragraph 1.8** for stowing MRE's on the same aircraft pallet as hazardous material.

A3.2.1.1. Flameless Ration Heaters (FRH), containing 8 grams or less of a magnesium-iron alloy (e.g., magnesium powder), packed as a component of the MRE, regardless of the number shipped, are not regulated by this manual (see A3.3.4). Prepare FRHs shipped separately from the MRE as regulated hazardous material according to this manual.

A3.2.1.2. Do not open, handle, or activate fuel sources shipped along with the MRE's inside the aircraft.

A3.2.2. Polymerizable Material. Transportation of any liquid, solid, or gaseous material that may polymerize (combine or react with itself) or decompose so as to cause dangerous evolution of heat or gas under normal transportation conditions is prohibited. Such materials may be offered for transportation when properly stabilized or inhibited.

A3.3. General Requirements Applicable to Hazard Class. In addition to A3.1. and A3.2., the following general requirements apply to each hazard class:

A3.3.1. Class 1.

A3.3.1.1. General Handling Instructions. Class 1 materials can function by detonation or combustion. Store away from fire hazards and handle carefully.

A3.3.1.1.1. Comply with safety precautions, standards, and rules in AFMAN 91-201 (Air Force), DA PAM 385-64 (ARMY), and NAVSEA OP 5 (Navy) during handling, transportation and storage of explosives.

A3.3.1.1.2. Do not ship explosives that have been dropped any distance, leaking, or otherwise damaged during transportation or handling until inspected by qualified munitions/EOD personnel.

A3.3.1.1.3. Onward shipment of suspected or damaged explosives may be made provided the shipment is inspected, repacked, and certified to be in proper condition for safe transport by qualified personnel.

A3.3.1.1.4. Package all Class 1 material in packaging that meets the PG I or II performance level.

A3.3.1.1.5. Comply with A3.1.16.1.3 and A3.16.4 for Inert Certification when all explosive components have been removed from an item.

A3.3.1.2. Forbidden Explosives. Do not offer explosives listed below for air shipment:

A3.3.1.2.1. An explosive not approved according to A3.3.1.4.

A3.3.1.2.2. An explosive mixture or device containing a chlorate and also containing:

A3.3.1.2.2.1. An ammonium salt including a substituted ammonium or quaternary ammonium salt.

A3.3.1.2.2.2. An acidic substance including a salt of a weak base and a strong acid.

A3.3.1.2.3. Nitroglycerin, diethylene glycol dinitrate, or any other liquid explosives not specifically authorized by **Attachment 5**.

A3.3.1.2.4. A loaded firearm except as authorized by **Chapter 3**.

A3.3.1.2.5. Fireworks that combine an explosive and a detonator.

A3.3.1.2.6. Fireworks containing yellow or white phosphorus.

A3.3.1.2.7. A toy torpedo whose outside dimension exceeds 23 mm (0.906 in), or a toy torpedo containing a mixture of potassium chlorate, black antimony (antimony sulphide), and sulphur if the weight of the explosive material in the device exceeds 0.26 g (0.01 oz).

A3.3.1.2.8. Explosives specifically forbidden in **Table A4.1**.

A3.3.1.3. Chemical Munitions. Chemical munitions are dangerous materials that are found in a variety of forms such as artillery shells, mortar shells, spray tanks, aircraft bombs, grenades, candles, rockets, and containers of chemical agents that are not high explosives or shrapnel.

A3.3.1.3.1. Handling Chemical Munitions. Use maximum preferential handling. Use the same materials handling equipment for high explosive munitions that is used for chemical munitions.

A3.3.1.3.2. Reporting and Disposing of Chemical Munitions. Immediately report any leaking chemical munitions to the agency initiating the shipment. If the leak is due to causes other than faulty munitions construction, report according to **paragraph 1.7**. Dispose of leaking or damaged chemical munitions according to applicable service directives. The report should include the following:

A3.3.1.3.2.1. Type and amount of chemical munitions.

A3.3.1.3.2.2. Lot number.

A3.3.1.3.2.3. Date discovered.

A3.3.1.3.2.4. Detailed information concerning the nature and possible cause of leak.

A3.3.1.3.2.5. Disposition or recommendation for disposition.

A3.3.1.4. Explosives Classification Approval. Explosives, explosive devices, and munitions, including commercial and foreign, to be eligible for military air transportation, must be either assigned a DOD classification or meet the provisions for transport without a DOD classification according to TB 700-2, NAVSEAINST 8020.8B, TO 11A-1-47, DLAR 8220.1, *DOD Ammunition and Explosive Hazard Classification Procedures*. All explosives indexed in the Joint Hazard Classification System (JHCS) are approved for movement by military controlled aircraft. Unless listed in the JHCS, a copy of the classification approval document must accompany the shipment. A copy is not required for 1.4S munitions. Transport explosives not listed in the JHCS only under one of the following conditions:

A3.3.1.4.1. Assigned a DOD interim hazard classification (IHC) by a DOD classification authority according to TB 700-2, NAVSEAINST 8020.8B, TO 11A-1-47, DLAR 8220.1

A3.3.1.4.2. Assigned a DOE final or interim hazard classification (IHC).

A3.3.1.4.3. Assigned a DOT-approved final hazard classification and EX number, and listed in **Table A4.1**, Column 7 (Special Provision) as "A69".

A3.3.1.4.4. An explosive classified as 1.4S in accordance with a foreign issued CAA or Special Approval document.

A3.3.1.4.5. Foreign troop (and hazardous materials) movements according to **paragraph 1.17**.

A3.3.1.4.6. Explosives and munitions transported for allied/coalition countries supporting joint operations with U.S. forces.

A3.3.1.5. Explosive Components of Airdrop Deployment Systems. Explosive components of parachutes or other airdrop deployment systems prepared or “rigged” according to technical directives, and intended for use during flight, are not governed by this manual.

A3.3.1.6. Unpackaged Explosives. Explosives must be packaged according **Attachment 5** except as identified in **paragraph 3.5**, **A3.3.1.9**, and **A5.2**.

A3.3.1.7. Captured Ammunition and Ammunition With Unknown Characteristics. Transport this ammunition on military aircraft only under the following provisions:

A3.3.1.7.1. Explosive ordnance disposal (EOD) personnel must inspect the items and complete necessary action to make them safe for air shipment, and sign a certificate to this effect.

A3.3.1.7.2. Assigned a Final or Interim Hazard Classification.

A3.3.1.7.3. Packed and marked according to the prescribed packaging in **Table A4.1**, including UN performance specification packaging requirements.

A3.3.1.8. Missiles, Rockets, and Rocket Motors. Missiles, rockets, and rocket motors may not contain liquid propellants forbidden by this manual. Shippers must provide written procedures for monitoring shipping containers equipped with leak detection indicators and also include emergency actions (to include actions necessary during flight)

in the event of a leak for items containing liquid or hypergolic fuel that is corrosive and/or toxic.

A3.3.1.9. Installed Explosive Devices. Remove installed explosive devices from aircraft systems unless removal is not required according to a technical directive or the directive identifies the explosives are permanently imbedded in the system.

A3.3.1.9.1. Inert Certification. IAW T.O. 11A-1-60, General Instructions Inspection of Reusable Munitions Containers and Scrap Material Generated from Items Exposed to, or Containing Explosives, inert certification will be done when required inspections are completed and items are free of hazardous or explosive contaminants. A certifying official will issue a certificate of clearance stating item(s) were 100% inspected and are inert and/or free of explosives related materials. Ensure inert certificate is provided for item(s) prior to offering for commercial and military transportation.

A3.3.1.9.2. When installation is authorized, comply with the technical directive and the following requirements:

A3.3.1.9.2.1. The safety devices must be in place and secured to the maximum extent possible (including blocking or banding when advantageous) to prevent arming.

A3.3.1.9.2.2. The aircraft system's packaging must provide reasonable security against tampering with the installed explosive items or the arming systems.

A3.3.1.9.2.3. Mark items according to **Attachment 14**.

A3.3.1.9.2.4. Complete Shipper’s Declaration for Dangerous Goods according to **Attachment 17**.

A3.3.1.10. Grandfathered Items. Government-owned explosives (Class 1) packaged before January 1990 are exempt from UN specification requirements. Ship these items under the packaging requirements in effect at the time of packaging. Annotate key 19 of the Shipper’s Declaration for Dangerous Goods "Government-owned goods packaged before 1 January 1990." See **Attachment 17** for certification instructions.

A3.3.2. Class 2.

A3.3.2.1. General Handling Instructions for All Compressed Gases. The following applies:

A3.3.2.1.1. Store compressed gases in a cool, ventilated area away from fire hazards, sources of heat, ignition, or sparks.

A3.3.2.1.2. When stored in an upright position, secure cylinders to fixed supports. Compressed gas cylinders may be palletized for shipment provided the valves are protected and cylinders are adequately secured to the pallet.

A3.3.2.1.3. Exercise care when handling compressed gases. Do not drop, jar, or slide cylinders since the gas may be toxic or asphyxiating. Personnel must know the importance of handling compressed gases properly.

A3.3.2.1.4. Ensure valves are always tightly closed and protected before offering for transportation.

A3.3.2.1.5. Do not pack cylinders, spheres, or containers under pressure in metal drums or airtight outside packages.

A3.3.2.2. Cylinder Requirements. Comply with 49 CFR and this manual for shipping compressed gas cylinders, including safety relief devices. Requirements covering cylinders also apply to spherical pressure vessels. Reference DLAI 4145.25/AR 700-68/ NAVSUPINST 4440.128D/MCO 10330.2D/AFMAN 23-227_IP for additional data on compressed gas cylinders.

A3.3.2.2.1. Cylinders or spherical pressure vessels must not contain gases or materials capable of combining chemically so as to endanger their serviceability. Make sure all cylinders, including closing devices and cushioning materials, are in good condition so that their contents are well protected during transit.

A3.3.2.2.2. Cylinder Requalification. DOT cylinders, UN pressure receptacles, or cylinders bearing a DOT-SP number offered for transportation must meet requalification and marking requirements IAW 49 CFR Part 180 and/or terms of the applicable special permit.

A3.3.2.2.3. Close each cylinder containing poisonous materials with a plug or valve meeting the following requirements:

A3.3.2.2.3.1. Each plug or valve must have a taper-threaded connection directly to the cylinder and be capable of withstanding the test pressure of the cylinder.

A3.3.2.2.3.2. Each valve must be of the packless type with nonperforated diaphragm, except that for corrosive materials, the valve may be of the packed type, provided the assembly is made gas-tight by means of a seal cap with gasketed joint attached to the valve body of the cylinder to prevent loss of material through or past the packing.

A3.3.2.2.3.3. Each valve outlet must be sealed by a threaded cap or threaded solid plug.

A3.3.2.2.3.4. Cylinders, valves, plugs, outlet caps, luting, and gaskets must be compatible with each other and with the material.

A3.3.2.3. Valve Protection. Protect all valves of containers charged with compressed gas by one of the following methods:

A3.3.2.3.1. By a securely attached metal cap of sufficient strength to protect the valve from injury during transit.

A3.3.2.3.2. By boxing or crating the cylinder or sphere to give proper protection to the valve. The outer packaging must be capable of meeting drop tests specified for Packing Group I.

A3.3.2.3.3. By recessed valve or otherwise protected valve so that it cannot be subjected to a blow when the container is dropped on a flat surface.

A3.3.2.3.4. The cylinder or vessel is secured as an attached component of a vehicle, equipment, trailer, or cart in a manner that will prevent damage to the valve during transit.

A3.3.2.4. Cylinder Orientation. Comply with the orientation requirements in DLAI 4145.25/A700-68/NAVSUPINST 4440.128D/MCO 10330.2D/AFMAN 23-227(I), paragraph 5-9. General Storage Requirements.

A3.3.2.5. Multiple-Element Gas Container. DOT Specification and UN approved cylinders may be interconnected by a manifold in accordance with 49 CFR §178.74 and 178.75, provided all valves are securely closed.

A3.3.2.6. Pressure and Filling Requirements. Ensure the pressure in the container at 21 degrees C (70 degrees F) is not more than the service pressure for which the container is marked or designated, except as provided below.

A3.3.2.6.1. When cylinders with a marked pressure limit are prescribed, other cylinders made under the same specification, but with a higher marked service pressure limit are authorized. For example, a cylinder marked DOT 4B500 may be used where DOT 4B300 is specified.

A3.3.2.6.2. The pressure in the cylinder or sphere at 55 degrees C (131 degrees F) must not exceed 1 1/4 times the service pressure except cylinders of acetylene, liquefied nitrous oxide, and liquefied carbon dioxide which must not exceed the allowable charging pressure of the cylinder.

A3.3.2.6.3. The pressure of a cylinder containing a Hazard Zone A & Hazard Zone B (poisonous material) must not exceed the service pressure of the cylinder at 55 degrees C (131 degrees F). Provide sufficient outage to ensure the cylinder is not liquid full at 55 degrees C (131 degrees F).

A3.3.2.6.4. Use the service pressure identified for a current specification for containers made before the effective date of specifications.

A3.3.2.6.5. Use the service pressure identified in **Figure A3.1** for authorized cylinders not marked with a service pressure.

Figure A3.1. Cylinder Specification and Service Pressures.

Specification Marking	Service Pressure Kilopascal	(Pounds Per Square Inch)
DOT-3	12411.0	(1800)
DOT-3E	12411.0	(1800)
DOT-4	2068.5	(300)
DOT-8	1723.8	(250)
DOT-9	1379.0	(200)
DOT-25	2068.5	(300)
DOT-33	3309.6	(480)
DOT-38	1723.8	(250)
DOT-40	1379.0	(200)
DOT-41	1654.8	(240)

A3.3.2.6.6. Except for carbon dioxide, 1.1-Difluoroethylene (R-1132A), nitrous oxide, and vinyl fluoride, inhibited, the liquid portion of a liquefied gas may not completely fill the packaging at any temperature up to and including 54 degrees C (130 degrees F). The liquid portion of vinyl fluoride, inhibited, may completely fill the cylinder at 54 degrees C (130 degrees F) provided the pressure at the critical temperature does not exceed 1 1/4 times the service pressure of the cylinder (see definition for filling density).

A3.3.2.6.7. DOT 3A, 3AX, 3AA, 3AAX, and 3T cylinders may be charged with compressed gases other than liquefied, dissolved, poisonous, or flammable gases to a pressure of 10 percent over their marked service pressure, provided the following conditions are met:

A3.3.2.6.7.1. Equip each cylinder with frangible disc safety devices (without fusible metal backing) having a bursting pressure not over the minimum prescribed test pressure.

A3.3.2.6.7.2. Determine the elastic expansion at the time of the last test or retest by the water-jacket method.

A3.3.2.6.7.3. Do not exceed either the average wall stress or the maximum wall stress limitations in **Figure A3.2**.

Figure A3.2. Wall-Stress Limitations.

Type of Steel	Average Wall Stress Limitation	Maximum Wall Stress Limitation
Plain carbon steels over 0.35 carbon and medium manganese steels.	53,000	58,000
Steels of analysis and heat treatment specified in DOT Specification 3AA.	67,000	73,000
Steels of analysis and heat treatment specified in DOT Specification 3T	87,000	94,000
Plain carbon steels less than 0.35 carbon made before 1920.	45,000	48,000

A3.3.2.6.8. Filling Density.

A3.3.2.6.8.1. Liquefied Petroleum Gases. Use **Figure A3.3** for filling density requirements of Liquefied Petroleum Gases. Any filling density prescribed in **Figure A3.3** may be increased by 2 percent for liquefied petroleum gas in DOT 26 or DOT 3 cylinders (or in DOT 3A cylinders marked for 1,800 pounds or higher service pressure, subject to the bullet above).

A3.3.2.6.8.2. Cryogenic Liquids of Argon, Helium, Neon, Nitrogen, and Oxygen. Use **Figure A3.4** for filling density requirements when shipping cryogenic liquids of argon, helium, neon, nitrogen, and oxygen.

A3.3.2.6.8.3. Hydrogen. Ship hydrogen (minimum 95 percent parahydrogen) according to **Figure A3.5**.

Figure A3.3. Filling Density for Liquefied Petroleum Gas.

Minimum Specific Gravity of the Liquid Material at 60 degrees F (15.5 degrees C)	Maximum Filling Density in Percent of the Water Capacity of the Container	Minimum Specific Gravity of the Liquid Material at 60 degrees F (15.5 degrees C)	Maximum Filling Density in Percent of the Water Capacity of the Container
0.271-0.289	26	0.504-0.510	42
0.290-0.306	27	0.511-0.519	43
0.307-0.322	28	0.520-0.527	44
0.323-0.338	29	0.528-0.536	45
0.339-0.354	30	0.537-0.544	46
0.355-0.371	31	0.545-0.552	47
0.372-0.398	32	0.553-0.560	48
0.399-0.425	33	0.561-0.568	49
0.426-0.440	34	0.569-0.576	50
0.441-0.452	35	0.577-0.584	51
0.453-0.462	36	0.585-0.592	52
0.463-0.472	37	0.593-0.600	53
0.473-0.480	38	0.601-0.608	54
0.481-0.488	39	0.609-0.617	55
0.489-0.495	40	0.618-0.626	56
0.496-0.503	41	0.627-0.634	57

Figure A3.4. Filling Density for Cryogenic Liquids Except Hydrogen.

Pressure control valve setting (maximum start-to-discharge pressure, kPa (psig))	Maximum permitted filling density (percent by weight)					
	Air	Argon	Nitrogen	Oxygen	Helium	Neon
310.3 (45)	82.5	133	76	108	12.5	109
517 (75)	80.3	130	74	105	12.5	104
724 (105)	78.4	127	72	103	12.5	100
1172 (170)	76.2	122	70	100	12.5	92
1585.8 (230)	75.1	119	69	98	12.5	85
2034 (295)	73.3	115	68	96	12.5	77
2482 (360)	70.7	113	65	93	12.5	
3103 (450)	65.9	111	61	91	12.5	
3723 (540)	62.9	107	58	88	12.5	
4309 (625)	60.1	104	55	86	12.5	
Design Service Temperature (degrees F)	-320	-320	-320	-320	-452	-411
(degrees C)	-196	-196	-196	-196	-269	-246

Figure A3.5. Filling Density for Cryogenic Liquids of Hydrogen.

Column 1	Column 2
Design service temperature	Minus 253 degrees C (-423 degrees F) or colder
Maximum permitted filling density, based on cylinder capacity at -253 degrees C (-423 degrees F)(see note)	6.7 percent
The pressure control valve must be designed and set to limit the pressure in the cylinder to not more than	117 kPa (17 psig)

NOTE: The filling density for hydrogen, cryogenic liquid, is defined as the percent ratio of the weight of lading in a package to the weight of water that the packaging will hold at -253 degrees C (-423 degrees F). The volume of the packaging at -253 degrees C (-423 degrees F) is determined in cubic inches. The volume is converted to pounds of water (1 pound of water = 27.737 cubic inches). Each cylinder must be constructed, insulated, and maintained so that the total rate of venting must not be over 30 standard cubic feet (SCF) of hydrogen per hour during transportation.

A3.3.2.7. Cylinders Requiring an Outer Packaging. Ship DOT 2P, 2Q, 3E, 3HT, spherical type 4BA, 4D, 4DA, 4DS, 9, 39, 40, and 41 cylinders in strong outer packaging. Ensure the package is capable of protecting the cylinder and all its parts from deformation or breakage resulting from a 1.2 m (4 foot) drop on a solid concrete or steel

floor. DOT 4BA spherical cylinders may be securely mounted on warehouse pallets to provide protection for the spheres and any attachments.

A3.3.2.8. Mandatory Color-Code Identification. Exact color-code identification of any material contained in a compressed gas cylinder is mandatory for DOD and DLA owned cylinders and must meet MIL-STD-101, *Color Code for Pipelines and for Compressed Gas Cylinders*.

A3.3.2.9. Unregulated Compressed Gases. Compressed gasses in the following items are not regulated:

A3.3.2.9.1. Inflated tires, when inflated to a pressure not greater than its rated inflation pressure.

A3.3.2.9.2. Inflated balls used for sports.

A3.3.2.9.3. Aerosols, containing non-flammable gas, with capacity of 50 ml or less.

A3.3.2.9.4. Carbonated beverages.

A3.3.2.9.5. Refrigerating machines, including dehumidifiers, air conditioners, and components thereof such as precharged tubing containing either of the following:

A3.3.2.9.5.1. 12 kg (25 pounds) or less of nonflammable liquefied gas.

A3.3.2.9.5.2. 12L (3 gallons) or less of Ammonia Solution (UN2672).

A3.3.2.9.6. Shipping containers and systems pressurized according to a technical directive with a non-flammable gas which has an absolute pressure of 40 psia or less inside the container at 20 degrees C (68 degrees F).

A3.3.2.9.7. Cylinders considered empty according to A3.1.16.2.

A3.3.2.9.8. Accumulators. Articles containing a non-flammable or non-toxic gas intended to function as shock absorbers that are manufactured to industry quality assurance standards; has a gas space capacity less than 1.6 L and a charge pressure not more than 280 bar where product of capacity (liters) and a charge pressure is not more than 80 (e.g. 0.5 L gas space and 160 bar charge pressure = 80); has a minimum burst pressure of 4 times the charge pressure at 20 degrees C, manufactured from a material which will not fragment; and when subject to fire is protected from rupture by degradable seal or pressure release device.

A3.3.2.9.9. Passenger Restraint Systems. A cylinder that is a component part of a passenger restraint system installed in a motor vehicle, and meeting the requirements in A6.3.6.

A3.3.2.9.10. Articles containing not more than 100 mg of an inert compressed gases (Argon, Helium, Neon, Nitrogen, and Xenon) and packaged so the quantity per package is 1 g or less.

A3.3.2.10. Non-DOT Specification Cylinders. The following non-DOT specification cylinders may be transported by military airlift.

A3.3.2.10.1. UN Specification cylinders marked with "USA" as country of approval.

A3.3.2.10.2. Foreign cylinder (other than UN cylinders) manufactured, inspected, and tested according to 49 CFR Part 178, or a copy of the competent authority approval of the nation manufacturing the cylinder accompanies the shipment. All other requirements of this manual also apply.

A3.3.2.10.3. Cylinders issued a DOT Special Permit or Exemption.

A3.3.2.10.4. Cylinders marked with the prefix "ICC" (i.e. ICC-4BA240) are authorized in place of cylinders required by this manual with a "DOT" prefix. The cylinders must comply with all other applicable specification requirements for DOT cylinders.

A3.3.2.11. Bulk Compressed Gas Tanks. Bulk compressed gas tanks must meet applicable cylinder specification requirements identified in **Attachment 6**, or be certified to a Competent Authority Approval (CAA), Certification of Equivalency (COE), or a DOT Special Permit (DOT-SP). If not certified to the above, the tank must be drained, purged, or otherwise considered empty. Use **paragraph A3.1.16** to identify "empty" tanks.

A3.3.2.12. Cylinders Containing Poisonous Material. Overpack cylinders containing a poisonous material, which have a wall thickness at any point of less than 2.03 mm (0.080 inch) and do not have fitted valve protection, in a strong outer container. The box must meet the requirements of A3.1. Ensure box and valve protection is of sufficient strength to protect all parts of the cylinder and valve (if it has a valve) from deformation and breakage resulting from a drop of 2.0 m (7 ft) or more onto a concrete or steel floor, impacting at an orientation most likely to cause damage. If the cylinder is not overpacked, equip the cylinder with a protective cap or other means of valve protection sufficient to protect the valve from deformation and breakage resulting from a drop of 2.0 m (7 ft) or more onto a concrete or steel floor, impacting at an orientation most likely to cause damage.

A3.3.2.13. Mounted Cylinders and Fire Extinguishers. Cylinders, other than those identified in A3.3.2.7, containing non-flammable gases (e.g., oxygen, air, nitrogen) and fire extinguishers may be shipped secured in holders of equipment and protected from possible accidental damage with safety pin/clip installed. Fire extinguishers not in an approved holder must be packaged according to A6.7.

A3.3.2.14. Aircraft Fire Suppression Bottles. Use description "Liquefied Gases, UN1058"; "Compressed Gas, N.O.S., UN1956"; or the hazard classification assigned by the manufacturer for DOT specification 3HT, 4D, 4DA, or 4DS. See **paragraph A6.4.1** and **Table A6.1**.

A3.3.2.15. Vehicle Fire Suppression Systems. Cylinders and pressure vessels which are an integral part of a vehicle fire suppression system and exceed 40 pounds per square inch absolute (psia) at 21 degrees C (70 degrees F) must be identified as a secondary hazard according to A17.5.2.

A3.3.2.16. Cryogenic Liquids.

A3.3.2.16.1. Container Requirements:

A3.3.2.16.1.1. Do not load a cylinder with a cryogenic liquid colder than the

design service temperature of the packaging.

A3.3.2.16.1.2. Do not load a cylinder with any material that may combine chemically with any residue in the packaging to produce an unsafe condition.

A3.3.2.16.1.3. The jacket covering the insulation on a cylinder used to transport any flammable cryogenic liquid must be made of steel.

A3.3.2.16.1.4. Do not install a valve or fitting made of aluminum, with internal rubbing or abrading aluminum parts that may come in contact with oxygen in the cryogenic liquid form, on any cylinder used to transport oxygen, cryogenic liquid unless the parts are anodized according to ASTM Standard B 580.

A3.3.2.16.1.5. Do not install an aluminum valve, pipe, or fitting on any cylinder used to transport any flammable cryogenic liquid.

A3.3.2.16.1.6. Provide each cylinder with one or more pressure relief devices.

A3.3.2.16.1.7. Install each pressure relief device and locate so that the cooling effect of the contents during venting will not prevent effective operation of the device.

A3.3.2.16.1.8. The maximum weight of the contents in a cylinder with a design service temperature colder than -195.5 degrees C (-320 degrees F) may not be over the design weight marked on the cylinder.

A3.3.2.16.1.9. Each cylinder containing a cryogenic liquid must have a pressure control system that conforms to 49 CFR §173.316 and must be designed and installed so that it will prevent the cylinder from becoming liquid full.

A3.3.2.16.2. Venting Requirements. Protect all containers by vent openings or safety relief devices to prevent excessive pressure buildup within the containers. The shipper must provide required equipment and specific venting instructions in the additional handling information block of the Shipper's Declaration for Dangerous Goods (see A17.5.2.), unless venting procedures are provided in a separate instruction accompanying the shipment or attached to the cargo. Crew members must monitor vent valves during flight. The following applies:

A3.3.2.16.2.1. Provide at least 4.6 m (15 feet) of 25.4 mm (one inch) inside diameter tubing or hose compatible with the product. Do not use rubber tubing for liquid oxygen.

A3.3.2.16.2.2. Provide sufficient clamps to attach tubing to the unit, the aircraft vent adapter, and other hoses if more than one unit is transported. Do not use sealing compound on tubing or hose connections.

A3.3.2.16.2.3. Provide T fittings and extra tubing or hose for the manifolding of two or more units to one aircraft vent. Tubing or hose must be routed to ensure freedom from kinks, sharp bends, or restrictions that prevent free venting and cause pressure buildup in the tubing or hose.

A3.3.2.16.2.4. Small containers (net capacity of 25 liters (6.6 gallons) or less) charged with a nonflammable, nonpoisonous cryogenic liquid, are excepted from the overboard venting requirement.

A3.3.2.17. Fuel Cell Cartridges.

A3.3.2.17.1. Except for fuel cell cartridges containing hydrogen in metal hydride, each fuel cell cartridge design type including when contained in or packed with equipment, must pass a 1.2 meter (3.9 feet) drop test onto an unyielding surface in the orientation most likely to result in the failure of the containment system with no loss of contents. Fuel cell cartridges installed in or integral to a fuel cell system are regarded as contained in equipment. Fuel cell cartridges containing a Division 2.1 material must meet the following additional requirements.

A3.3.2.17.1.1. Be capable of withstanding, without leakage or bursting, a pressure of at least two times the equilibrium pressure of the contents at 55 °C (131 °F);

A3.3.2.17.1.2. Contain no more than 200 mL of liquefied flammable gas with a vapor pressure not exceeding 1,000 kPa (150 psig) at 55 °C (131 °F); and

A3.3.2.17.1.3. Pass the hot water bath test prescribed in accordance with 49 CFR §173.306(a)(3)(v).

A3.3.2.17.2. Fuel cell cartridges containing hydrogen in a metal hydride must conform to the following:

A3.3.2.17.2.1. Have a water capacity less than or equal to 120 mL.

A3.3.2.17.2.2. The pressure in the fuel cell cartridge must not exceed 5 MPa at 55 degrees C.

A3.3.2.17.2.3. The design must withstand, without leaking or bursting, a pressure of two times the design pressure of the cartridge at 55 degrees C or 200 kPa more than the design pressure of the design pressure of the cartridge at 55 degrees C, whichever is greater.

A3.3.2.17.2.4. Each fuel cell cartridge must be filled in accordance with the procedure provided by the manufacturer.

A3.3.2.17.2.5. Fuel cell cartridges must contain the following permanent markings:

A3.3.2.17.2.5.1. Rated charging pressure in megapascals (MPa).

A3.3.2.17.2.5.2. Manufacturers serial number or unique identification number.

A3.3.2.17.2.5.3. Date of expiration based on the maximum service life.

A3.3.2.17.2.6. Each fuel cell cartridge must pass the following design type tests:

A3.3.2.17.2.6.1. Drop test. A 1.8 m drop test onto an unyielding surface in four different orientations.

A3.3.2.17.2.6.1.1. On the vertical end containing the shut-off valve assembly.

A3.3.2.17.2.6.1.2. On the vertical end opposite to the shut-off valve assembly.

A3.3.2.17.2.6.1.3. Horizontally, onto a stell apex onto a steel apex with a diameter of 38 mm, with the steel apex in the upward position.

A3.3.2.17.2.6.1.4. At a 45 degree angle on the end containing the shut-off valve.

A3.3.2.17.2.6.2. Fire test. The fuel cells cartridge design may include a vent and be subject to one of the following fire tests:

A3.3.2.17.2.6.2.1. The internal pressure vents to zero gauge pressure without rupture of the cartridge.

A3.3.2.17.2.6.2.2. The cartridge withstands the fire for a minimum of 20 minutes without rapture.

A3.3.2.17.2.6.3. Hydrogen cycling test. A fuel cell cartridge must be subjected to a hydrogen cycling test described in 49 CFR §173.230(d)(5)(iii), to ensure that the design stress limits are not exceeded during use.

A3.3.2.17.2.7. Production leak test. Each fuel cell cartridge must be tested for leaks at 15 °C ± 5 °C (59 °F ± 9 °F) while pressurized to its rated charging pressure. There must be no leakage. Leakage must be determined using a soap bubble solution or other equivalent means on all possible leak locations.

A3.3.3. Class 3.

A3.3.3.1. General Handling Instructions. Store flammable liquids in cool, well-ventilated areas. Do not store near sources of heat, flames, sparks, combustible materials, or oxidizing agents. Keep containers tightly closed to prevent the evaporation of flammable liquids. Although classed as a flammable liquid, some materials in this attachment may also be described as corrosive or toxic. In the event of leakage or spillage, use rubber gloves, goggles, aprons, and respirators.

A3.3.3.2. Combustible Liquids. The requirements in this manual does not apply to materials classed as combustible liquids with the following exceptions:

A3.3.3.2.1. Non-bulk packages must be capable of meeting air-eligible pressure requirements specified for Class 3 Packing Group III specified in A3.1.7.1. or A3.1.7.2.

A3.3.3.2.2. Bulk combustible liquids must be transported in UN specification packaging (e.g., IBCs) meeting air eligibility requirements of **paragraph A3.1.7.2** for PG III.

A3.3.3.2.3. Use the same fuel level requirements specified in **Attachment 13** for flammable liquids when a combustible liquid is used as fuel for a vehicle, self-propelled item, or SE.

A3.3.3.3. Fuel for Vehicles and Equipment. Transport fuel needed to operate vehicles and equipment at the deployment site in air-eligible UN specification containers listed in **paragraph A7.2**. If required, stow these containers in the vehicle or equipment according to **paragraph 1.8** The following applies when using jerricans:

A3.3.3.3.1. Allow sufficient ullage (outage) and tightly secure jerrican caps to prevent leakage.

A3.3.3.3.2. Secure jerricans in permanently configured and approved holders on vehicles or equipment. If secured in this manner, they may be considered a secondary hazard, and included in Key 19 of the Shipper's Declaration of Dangerous Goods (see **A17.5.3.1**).

A3.3.3.3.3. DOT 5L jerricans are not authorized for air shipment of fuel, and must be drained to the greatest extent possible.

A3.3.3.3.4. UN specification jerricans (not in an approved holder) may be shipped palletized, loaded and secured on a vehicle, or floor loaded. Prepare a separate Shipper's Declaration of Dangerous Goods according to **Attachment 17**.

A3.3.3.4. Fuel-in-Tank Limitations. Limit fuel in vehicles, self-propelled units, wheeled engine-powered SE, and all other types of SE to a minimum. Commanders must consider availability of fuel at the destination and operational requirements for mission readiness when determining fuel levels and ship with less than the maximum allowable amount when possible. Units transported under the provisions of **Chapter 3** may contain additional quantities of fuel in tank according to **Attachment 13**, **paragraphs A13.4** and **A13.5**, based on operational necessity. During redeployments, unless mission readiness is affected, limit fuel in tank to a minimum. The preparer (certifying official) must ensure any unnecessary fuel is drained prior to shipment. See **Attachment 17** for certification requirements.

A3.3.3.5. Bulk Fuel. Do not transport bulk tanks which are part of servicing trucks, trailers, semitrailers, or individual bulk storage tanks containing flammable fuel, or any bulk hazardous material by air (except as authorized in **paragraph A7.2.9**). Bulk combustible liquids must be transported in UN specification packaging (e.g., IBCs) meeting air eligibility requirements of **paragraph A3.1.7.2** for PG III. The following draining/purging requirements apply:

A3.3.3.5.1. Purge bulk tanks for all liquids with a flash point below 38 degrees C (100 degrees F), regardless of whether the technical manual only requires draining.

A3.3.3.5.2. Drain, but need not purge, liquids with a flash point at or above 38 degrees C (100 degrees F), unless the technical manual specifically requires purging.

A3.3.3.5.3. Provide air circulation in the cargo compartment of pressurized aircraft.

A3.3.3.5.4. External aircraft fuel tanks must be drained and purged of all fuel from the tank, stand-pipe, and internal lines to prevent leaking during transport.

A3.3.3.6. Equipment Fuel Leakers. The shipper is responsible for ensuring the maximum allowable fuel-in-tank is not exceeded, the amount of fuel is necessary to meet operational requirements for mission readiness, and the equipment is prepared properly to prevent leakage. Measure the fuel quantity on a level surface. The following items are considered fuel leakers and must be drained of fuel:

A3.3.3.6.1. MC-1A and MC-2A compressors. The MC-1A model 2MC-1A, T.O. 34Y1-56-71, CAGE 16004, part number 66950, NSN 4310-01-060-0642 is not considered a leaker and may be shipped with fuel-in-tank according to **Chapter 3**.

Identify the item nomenclature on the Shipper's Declaration form as "2MC-1A". Units must stencil "2MC-1A' on the item.

A3.3.3.6.2. MA-3 air conditioner.

A3.3.3.6.3. H-1 heater.

A3.3.3.6.4. The USCSMK Boston Whaler boat. The United States Navy Patrol Boat Light (PBL) is not considered a leaker and may be shipped with fuel-in-tank as authorized according to this manual.

A3.3.3.6.5. The USMC River Assault Craft (RAC).

A3.3.3.6.6. All commercial SE.

A3.3.3.7. Pads and Swabs. Pads, swabs, rags, and similar items soaked with a flammable liquid and sealed in a bag are not subject to the requirements of this manual provided there is no free liquid and each bag or packet contains no more than 10 ml of a flammable liquid in PG II or PG III. If a bag or packet contains an item(s) soaked with PG I flammable liquid or soaked with more than 10 ml of a PG II or PG III flammable liquid refer to requirements for “Solids Containing Flammable Liquids, N.O.S.,” UN3175.

A3.3.3.8. Alcoholic Beverages. Alcoholic beverages in packagings of five liters or less are not subject to the requirements of this manual.

A3.3.3.9. Fuel Cell Cartridges. Fuel cell cartridges design types using liquids as fuels must pass an internal pressure test at a pressure of 15 psig (100 kPa (gauge) without leakage. Each fuel cell cartridge design type must pass a 1.2 m drop test onto an unyielding surface in the orientation most likely to result in failure of the containment system with no loss to the contents.

A3.3.4. Class 4.

A3.3.4.1. General Handling Instructions. Class/Division 4.1 material containing self-reactive substances must be protected from direct sunlight and stored in a cool and well-ventilated location, away from all sources of heat. Do not store near corrosives (Class 8). Tightly and securely close all containers. These items may be water reactive and spontaneously combustible. Do not pack Class 4 material in the same outer packaging with corrosive liquids, unless the corrosive liquids are in bottles cushioned by incombustible, non-reactive absorbent material. Place the cushioned bottles in tightly closed metal containers. Material in quantities not over 118 ml (4 ounces) in securely closed metal cans can be packed for military air transport in the same compartment with other securely packed materials necessary for a complete fumigant.

A3.3.4.2. Packaging. Unless otherwise specified by a packaging paragraph, package a material identified as PG III in **Table A4.1** in a container that meets the PG I or II performance level.

A3.3.4.3. Flameless Ration Heaters (FRH). FRH containing 8 grams or less of a magnesium-iron alloy (e.g., magnesium powder), packaged as a component of meals-ready-to-eat are not subject to the requirements of this manual (see **paragraph A3.2.1.1**). This exception does not apply to a heater that is packaged separately from a meal or that contains more than 8 grams of a magnesium-iron alloy.

A3.3.4.4. Charcoal Briquettes. Lump charcoal briquettes, packaged in a form suitable for consumer use, generally will not meet the classifying criteria of a Class 4.2 spontaneously combustible material. If the charcoal briquettes do not meet the definition of a Class 4.2 material, it is not subject to any other requirements of this manual. Ensure the specific type and form of charcoal being shipped does not meet the definition of a Class 4.2 material and passed the self-heating test for carbon (which indicates that it is not spontaneously combustible).

A3.3.4.5. Fusee. The PSN "FUSEE" is only valid for domestic movement. For international shipment you must use the PSN "SIGNAL DEVICES, HAND" and package the material as required by the packaging paragraph for signal devices, hand.

A3.3.4.6. Fuel Cell Cartridges.

A3.3.4.6.1. Fuel cell cartridges design types using liquids as fuels must pass an internal pressure test at a pressure of 15 psig (100 kPa (gauge) without leakage.

A3.3.4.6.2. Each fuel cell cartridge design type must pass a 1.2 m drop test onto an unyielding surface in the orientation most likely to result in failure of the containment system with no loss to the contents.

A3.3.4.6.3. May contain an activator provided it is fitted with two independent means of preventing unintended mixing with the fuel during transport.

A3.3.5. Class 5.

A3.3.5.1. General Handling Instructions. Organic Peroxides must be protected from direct sunlight and stored in a cool and well-ventilated location, away from all sources of heat.

A3.3.5.2. Packed with Other Materials. Do not pack Class 5 materials in the same outer packaging with corrosive liquids, unless the corrosive liquids are in bottles cushioned by incombustible absorbent material in tightly closed metal containers. Class 5 materials in securely closed metal cans and in quantities not over 118 ml (4 ounces), are acceptable for air shipment if packed in the same compartment with other securely packed materials necessary for a complete fumigant.

A3.3.5.3. Packaging. Unless otherwise specified by a packaging paragraph, package a material identified as PG III in **Table A4.1** in a container that meets the PG I or II performance level.

A3.3.5.4. Control and Emergency Temperature. Packaged items in Class 5.2 may require controlled temperature conditions during shipment. **Table A9.1** lists the "control temperatures" for specific organic peroxide items (by technical name), when applicable, in column 8. The following applies:

A3.3.5.4.1. The control temperature is the temperature above which a material may not be offered for transportation.

A3.3.5.4.2. The emergency temperature is the temperature at which emergency procedures must be initiated due to imminent danger resulting from overheating of the shipment.

A3.3.5.4.3. Guidance for packaging materiel requiring temperature control during shipment is contained in DLAI 4145.21/TB MED284/NAVSUPINST 4610.31/ AFJI 41-208, *Preparation of Medical Materiel Requiring Freeze or Chill Environment for Shipment*.

A3.3.6. Class 6.

A3.3.6.1. General Handling Instructions.

A3.3.6.1.1. Toxic material can react through the skin, respiratory tract, or gastrointestinal tract. In general, solid toxic material that is improperly packaged will present an ingestion hazard. Dust and mists result primarily in an inhalation hazard. Liquids may be ingested, inhaled as a vapor, or absorbed through the skin.

A3.3.6.1.2. Keep cool and away from direct rays of the sun and high temperature. Store away from sources of ignition and fire hazards. Avoid direct contact with the material. Storage areas must be plainly marked with the appropriate placards.

A3.3.6.1.3. Keep away from oxidizing materials.

A3.3.6.1.4. Make sure personnel exposed to leaking materials wear a protective mask or self-contained breathing apparatus (specific recommendations can be obtained from the medical services.)

A3.3.6.1.5. Store away from acids or acid fumes.

A3.3.6.1.6. Do not place any liquid toxic material on the same 463L pallet with foodstuffs or rations.

A3.3.6.1.7. Handle toxins containing infectious agents meeting the criteria for inclusion as a Division 6.2 material as a Category A Infectious subtances UN2814 or UN2900. Handle all other toxins extracted from living sources as UN3172 or UN3462.

A3.3.6.2. General Requirements.

A3.3.6.2.1. Medical or Clinical Waste containing Category A infectious substances or containing Category B infectious substances (in cultures) shall be assigned to UN2814 or UN2900 as appropriate.

A3.3.6.2.2. Medical or Clinical Waste containing (or has a probability of containing) infectious substances in Category B, other than cultures, shall be assigned to UN3291.

A3.3.6.2.3. Category B infectious substances in cultures shall be assigned to UN2814 or UN2900 as appropriate.

A3.3.6.2.4. Category B infectious substances, other than cultures, shall be assigned to UN3373 and are excepted from all other requirements of this manual provided:

A3.3.6.2.4.1. The package is marked “Biological Substance, Category B.” Marking must be at least 6mm.

A3.3.6.2.4.2. “UN3373” is contained within a white square-on-point label displayed on the outer packaging on a background of a contrasting color.

A3.3.6.2.4.3. The completed package meets the requirements of A10.9.

A3.3.6.2.5. Biological products known or reasonably believed to contain infectious substances that meet the criteria for inclusion in Category A or Category B shall be assigned to UN2814, UN2900, or UN3373, as appropriate.

A3.3.6.2.6. A packaging containing inner packagings of Division 6.2 materials may not contain other hazardous materials except:

A3.3.6.2.6.1. Refrigerants, such as dry ice or liquid nitrogen, as authorized under the HMR;

A3.3.6.2.6.2. Anticoagulants used to stabilize blood or plasma; or

A3.3.6.2.6.3. Small quantities of Class 3, Class 8, Class 9 or other material in Packing Group II or III not exceeding 30 ml or 30g per inner packaging, and 4L or 4kg per outer package, may be used to stabilize or prevent degradation of the sample. Such preservatives are not subject to requirements of this manual.

A3.3.6.2.7. Infectious agents identified as Biological select agents and toxins (BSAT) under the 42 CFR §73.3, 42 CFR §73.4, 7 CFR §331.3, 9 CFR §121.3, and 9 CFR §121.4 must also comply with the 42 CFR, 7 CFR, 9 CFR requirements and all other applicable regulatory requirements including but not limited to those specified by the United States Department of Health and Human Services (DHHS) Centers for Disease Control and Prevention (CDC), the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS), the United States Department of Commerce, and the Department of Defense.

A3.3.6.2.8. In addition to meeting applicable packaging standards for Division 6.2 material as required in **Attachment 10**, personnel transporting infectious agents, biological research material, patient specimens, genetically modified microorganisms, and other associated biological research material or samples must ensure all applicable import and export permits (including intrastate permits) are obtained prior to transport of specimens. Receivers have the ultimate responsibility for ensuring all necessary permits are obtained.

A3.3.6.2.9. Personnel must all ensure all necessary transfer documents required by the 42 CFR, 7 CFR, 9 CFR, and applicable biosurety regulations are appropriately signed and emplaced prior to transport of specimens. Both the shipper and the receiver must ensure advanced arrangements are made prior to transfer/transport of samples.

A3.3.6.2.10. A Division 6.2. packaging to be reused must be disinfected prior to reuse by any means effective for neutralizing the infectious substance the packaging previously contained. A secondary packaging or outer packaging need not be disinfected prior to reuse if no leakage from the primary receptacle has occurred.

A3.3.6.2.11. Body parts, organs or whole bodies believed to be contaminated with an infectious agent must be packaged and shipped as UN2814 or UN2900 unless exceptions to these packaging requirements are obtained through Department of Defense channels.

A3.3.6.2.12. Radiobioassay samples, meeting the definition of Class 7 other than limited quantities, will follow the requirements for radioactive materials in this manual.

A3.3.6.2.13. Forensic material known or suspected of containing an infectious substance or select agent must adhere to the requirements for a category A or B infectious substance as appropriate.

A3.3.6.3. Unregulated Infectious Material. The following are not regulated by this manual:

A3.3.6.3.1. Live animals infected or injected with an infectious substance or biological product provided they are accompanied by technically qualified escorts.

A3.3.6.3.2. Blood or blood components which have been collected for the purposes of transfusion or for the preparation of blood products to be used for transfusion or transplantation and any tissues or organs intended for use in transplantation.

A3.3.6.3.3. Biological products manufactured and packaged in accordance with the requirements of the appropriate national authorities and transported for the purposes of final packaging or distribution, and used for personal health care by medical professionals or individuals.

A3.3.6.3.4. Medical, biomedical, or clinical waste not containing a Category A or B infectious substance unless they meet the criteria of another hazard.

A3.3.6.3.5. Patient/diagnostic specimens not containing a Category A or B infectious substance.

A3.3.6.3.6. Used health care products meeting the requirements of Title 49 CFR §173.134(b).

A3.3.7. Class 7.

A3.3.7.1. General Handling Instructions. Handle radioactive material carefully to ensure there is no contamination of personnel or the transport vehicle. A person may not remain unnecessarily in the immediate vicinity of any package containing radioactive material.

A3.3.7.2. Unregulated Radioactive Material. The following radioactive materials are not regulated by this manual:

A3.3.7.2.1. Radioactive material implanted or incorporated into a person or live animal for diagnosis or treatment.

A3.3.7.2.2. Natural material and ores containing naturally occurring radionuclides, which are either in their natural state or have only been processed for purposes other than for extraction of the radionuclides, and not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values for exempt materials specified in **Table A11.1**.

A3.3.7.2.3. Non-radioactive solid objects with radioactive substances present on any surfaces in quantities not in excess of the limit specified in A3.3.7.3.3.

A3.3.7.3. Nomenclature. Radioactive materials are grouped according to their form and/or characteristics. A radioactive material may meet the definition of one or more of

these groups. These groups include Special Form, Low Specific Activity (LSA), Surface Contaminated Object (SCO), Fissile, Low dispersible radioactive material, and Other form.

A3.3.7.3.1. Special Form.

A3.3.7.3.1.1. Design Requirements. Special Form radioactive material must meet all requirements in 49 CFR §173.403 and §173.469.

A3.3.7.3.1.2. Approval of Special Form Radioactive Material.

A3.3.7.3.1.2.1. Each shipper of special form radioactive materials must maintain on file for at least 1 year after the latest shipment, a complete safety analysis, including documentation of any tests demonstrating that the special form material meets the requirements of 49 CFR §173.476. An International Atomic Energy Agency (IAEA) certificate of competent authority issued for the special form material may be used to satisfy this requirement.

A3.3.7.3.1.2.2. Before the first export shipment of a special form radioactive material from the United States, each shipper must obtain a competent authority certificate for the specific material. For special form material manufactured outside the United States an IAEA certificate of component authority from the country of origin may be used to meet this requirement. For special form materials manufactured in the United States each shipper must obtain a US competent authority certificate for the specific material. Submit each petition for a US competent authority certificate according to 49 CFR §173.476 and include the following information:

A3.3.7.3.1.2.2.1. A detailed description of the material or, if a capsule, a detailed description of the contents. Make a particular reference to both physical and chemical states.

A3.3.7.3.1.2.2.2. If a capsule is used, a detailed statement of its design and dimensions, including complete engineering drawings and schedules of material, and methods of construction.

A3.3.7.3.1.2.2.3. A statement of tests performed and their results; evidence based on calculative methods to show that the material is able to pass the tests; or other evidence that the special form radioactive material complies with 49 CFR §173.469.

A3.3.7.3.1.2.3. The documentation requirements specified in the bullets above do not apply in those cases where A_1 equals A_2 and the material is not described on the shipping papers as "Radioactive Material, Special Form, N.O.S."

A3.3.7.3.2. Low Specific Activity (LSA) Material. LSA material is classified in one of three groups:

A3.3.7.3.2.1. LSA-I. LSA-I material is:

A3.3.7.3.2.1.1. Uranium and thorium ores and concentrates of such ores, and other ores containing naturally occurring radionuclides which are intended to

be processed for the use of these radionuclides.

A3.3.7.3.2.1.2. Solid, unirradiated natural uranium or depleted uranium or natural thorium or their solid or liquid compounds or mixtures.

A3.3.7.3.2.1.3. Radioactive material, for which the A_2 value is unlimited, other than fissile material in quantities not excepted under A3.3.7.3.4.2.

A3.3.7.3.2.1.4. Other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the values for activity concentration for exempt materials specified in **Table A11.1**, or 30 times the General Exemption Values in 49 CFR §173.433, Table 8, excluding fissile material in quantities not excepted under A3.3.7.3.4.2.

A3.3.7.3.2.2. LSA-II. LSA material is:

A3.3.7.3.2.2.1. Water with tritium concentration up to 0.8 TBq/L.

A3.3.7.3.2.2.2. Other material in which the activity is distributed throughout and the estimated average specific activity does not exceed 10^{-4} A_2/g for solids and gases, and 10^{-5} A_2/g for liquids.

A3.3.7.3.2.3. LSA-III. LSA-III material is a solid (e.g., consolidated wastes, activated materials), excluding powders, meeting the test requirements of 49 CFR §173.468 and in which:

A3.3.7.3.2.3.1. The radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.).

A3.3.7.3.2.3.2. The radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble material, so that even under loss of packaging, the loss of radioactive material per package by leaching, when placed in water for 7 days, would not exceed 0.1 A_2.

A3.3.7.3.2.3.3. The estimated average specific activity of the solid does not exceed 2 x $10^{-3}A_2$/g.

A3.3.7.3.3. Surface Contaminated Object (SCO). SCO is classified in one of two groups; SCO-I and SCO-II.

A3.3.7.3.3.1. SCO-I. A solid object on which:

A3.3.7.3.3.1.1. The nonfixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4 Bq/cm^2 (10^{-4} microcurie/cm^2) for beta and gamma and low toxicity alpha emitters, or 0.4 Bq/cm^2 (10^{-5} microcurie/cm^2) for all other alpha emitters.

A3.3.7.3.3.1.2. The fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4 x 10^4 Bq/cm^2 (1.0 microcurie/cm^2) for beta and gamma and low toxicity alpha emitters, or 4 x 10^3 Bq/cm^2 (0.1 microcurie/cm^2) for all other alpha

emitters.

A3.3.7.3.3.1.3. The nonfixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4 x 10^4 Bq/cm^2 (1 microcurie/cm^2) for beta and gamma and low toxicity alpha emitters, or 4 x 10^3 Bq/cm^2 (0.1 microcurie/cm^2) for all other alpha emitters.

A3.3.7.3.3.2. SCO-II. A solid object on which the limits for SCO-I are exceeded and on which:

A3.3.7.3.3.2.1. The nonfixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 400 Bq/cm^2 (10^{-2} microcurie/cm^2) for beta and gamma and low toxicity alpha emitters or 40 Bq/cm^2 (10^{-3} microcurie/cm^2) for all other alpha emitters.

A3.3.7.3.3.2.2. The fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 8 x 10^5 Bq/cm2 (20 microcuries/cm^2) for beta and gamma and low toxicity alpha emitters, or 8 x 10^4 Bq/cm^2 (2 microcuries/cm^2) for all other alpha emitters.

A3.3.7.3.3.2.3. The nonfixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 8 x 10^5 Bq/cm^2 (20 microcuries/cm^2) for beta and gamma and low toxicity alpha emitters, or 8 x 10^4 Bq/cm^2 (2 microcuries/cm^2) for all other alpha emitters.

A3.3.7.3.4. Fissile Material. Fissile material includes Uranium-233, Uranium-235, Plutonium-239, Plutonium-241, or any combination of these.

A3.3.7.3.4.1. Specific Requirements for Fissile Shipments.

A3.3.7.3.4.1.1. Packages containing fissile radioactive material which are not excepted according to A3.3.7.3.4.2 must be assigned a criticality safety index (CSI) and a transport index (TI).

A3.3.7.3.4.1.2. Fissile material packages and conveyances transporting these packages must satisfy the radiation level restrictions in A3.3.7.10.

A3.3.7.3.4.1.3. Except for consignments under exclusive use, the CSI of any packages or overpack may not exceed 50. A fissile material package with CSI greater than 50 must be transported by exclusive use.

A3.3.7.3.4.1.4. For non-exclusive use shipments of fissile material packages the total sum of CSIs in a freight container or on a conveyance may not exceed 50.

A3.3.7.3.4.1.5. For exclusive use shipments of fissile material packages the total sum of CSIs in a freight container or on a conveyance may not exceed 100.

A3.3.7.3.4.1.6. Exclusive use shipments of fissile material packages must

satisfy the radiation level and administrative requirements of 49 CFR §173.441(b).

A3.3.7.3.4.1.7. Mixing fissile material packages with other types of radioactive materials, in any conveyance is authorized only if the TI of any single package does not exceed 10, the CSI of any single package does not exceed 50 and the requirements in this paragraph and in **A3.3.7.10** are met.

A3.3.7.3.4.1.8. See **Attachment 24** for Fissile Class III shipments.

A3.3.7.3.4.2. Fissile Material Exception. Fissile material meeting one of the following is excepted from the requirement to be transported in packages that comply with 49 CFR §173.453 and from the other requirements of this manual that apply to fissile material. Only one type of exception is permitted per consignment.

A3.3.7.3.4.2.1. A mass limit per consignment provided the smallest external dimension of each package is not less than 10cm, such that:

$$\frac{\text{Mass of uranium - 235 (g)}}{X} + \frac{\text{mass of other fissile material (g)}}{Y} < 1$$

Where X and Y are the mass limits defined in Table A3.3. provided one of the following:

A3.3.7.3.4.2.1.1. Each individual package contains not more than 15g of fissile material.

A3.3.7.3.4.2.1.2. The fissile material is a homogenous hydrogenous solution or mixture where the ratio of fissile nuclides to hydrogen is less than 5% by mass.

A3.3.7.3.4.2.1.3. There is not more than 5g of fissile material in any 10L volume of material. ***NOTE:*** Neither Beryllium nor Deuterium in hydrogenous material enriched in deuterium shall be present in quantities exceeding 1% of the applicable consignment mass limits provided in **Table A3.3**.

Table A3.3. Consignment Mass Limits for Exceptions from the Requirements for Packages Containing Fissile Material.

Fissile Material	Fissile Material mass (g) mixed with substances having an average hydrogen density ≤ water	Fissile Material mass (g) mixed with substances having an average hydrogen density > water
Uranium-235 (X) Other fissile material (Y)	400 250	290 180

A3.3.7.3.4.2.2. Uranium enriched in Uranium-235 to a maximum of 1% by weight, and with a total plutonium and Uranium-233 content not exceeding 1% of the weight of Uranium-235, provided that the fissile material is distributed essentially homogeneously throughout the material. In addition, if Uranium-235 is present in metallic, oxide, or carbide forms, it must not form a lattice arrangement.

A3.3.7.3.4.2.3. Liquid solutions of uranyl nitrate enriched in Uranium-235 to a maximum of 2% by weight, with a total plutonium and Uranium-233 content not exceeding 0.002% of the weight of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) or 2.

A3.3.7.3.4.2.4. Plutonium containing not more than 20% of fissile nuclides by mass up to a maximum of 1kg plutonium per consignment. Shipments under this exception must be under exclusive use.

A3.3.7.3.5. Low Dispersible Material. Low dispersible material shall be such that the radiation level at 3m from the unshielded radioactive material does not exceed 10 mSv/h.

A3.3.7.4. General Transportation Requirements.

A3.3.7.4.1. Secure each shipment of radioactive materials to prevent shifting during normal transportation conditions.

A3.3.7.4.2. Except as specifically required by a CAA, a package of radioactive materials may be carried among packaged general cargo without special stowage provisions, if:

A3.3.7.4.2.1. The heat output in watts is not over 0.1 times the minimum package dimension in centimeters. 49 CFR §173.448

A3.3.7.4.2.2. The average surface heat flux of the package is not over 15 watts per square meter (W/m^2) and the immediately surrounding cargo is not in sacks or bags or otherwise in a form that would seriously impede air circulation for heat removal. 49 CFR §173.448

A3.3.7.4.3. Aircraft in which radioactive materials have been spilled may not again be placed in service or routinely occupied until radiation dose rate at any accessible surface is less than 0.005 mSv/h (0.5 mrem/h) and there is no significant removable radioactive surface contamination as determined in A3.3.7.6. When contamination is present or suspected, segregate the package and any other materials it has touched as far as practical from personnel contact until needed radiological advice or assistance is obtained. For personnel safety, take care to avoid possible inhalation, ingestion, or contact with radioactive materials that may have leaked or spilled from its package. Leave any loose radioactive materials and associated packaging materials in a segregated area pending disposal instructions from responsible radiological authorities.

A3.3.7.4.4. Do not offer for military airlift:

A3.3.7.4.4.1. Any type B(U) or type B(M) package with an accessible surface temperature in excess of 50 degrees C (122 degrees F).

A3.3.7.4.4.2. Any continuously vented type B(M) packages, which require external cooling by an auxiliary cooling system or packages subject to operational controls during transport.

A3.3.7.4.4.3. Any liquid pyrophoric radioactive materials.

A3.3.7.4.5. Do not transport exclusive use shipments of packages having a surface radiation level in excess of 2 mSv/h (200 mrem/h) except by special arrangement.

A3.3.7.5. Stowage on Aircraft or Storage Incident to Transportation.

A3.3.7.5.1. Do not ship radioactive Category II-Yellow or Category III-Yellow material on the same aircraft or store in any one area, such as a transit area, terminal building, storeroom, or assembly yard, if the sum of the critical safety indices in any individual group of packages exceeds 50. (49 CFR §173.447, 173.457, and §175.702)

A3.3.7.5.2. If the total critical safety index for all packages, overpacks, or freight containers exceeds 50, separate the packages overpacks, or freight containers into groups. Store groups of these packages so as to maintain a spacing of at least 6 meters (20 feet) from each other group.

A3.3.7.5.3. Ensure separation of Category II-Yellow or Category III-Yellow material from packages containing undeveloped film according to the distances shown in 49 CFR §175.706.

A3.3.7.5.4. Radioactive Category II-Yellow and Category III-Yellow material must be separated from persons or animals by a minimum of 2 pallet positions (176 inches) at all times while on the aircraft. If the total transport index of all packages on the aircraft exceeds 50, the separation distance between the surfaces of the radioactive materials packages and the surfaces bounding the space occupied by persons or animals must be at least 9 m (30 feet).

A3.3.7.5.5. The maximum limits are as follows:

A3.3.7.5.5.1. A maximum transport index of 10 per individual package.

A3.3.7.5.5.2. A maximum critical safety index of 100 per aircraft.

A3.3.7.5.5.3. A maximum transport index of 200 per aircraft.

A3.3.7.6. Radioactive Contamination.

A3.3.7.6.1. Contamination Control. Keep the level of nonfixed (removable) radioactive contamination on the external surfaces of each package offered for shipment as low as practical. The level of nonfixed radioactive contamination may be determined by wiping an area of 300 cm^2 of the surface concerned with an absorbent material, using moderate pressure, and measuring the activity on the wiping material. Take sufficient measurements in the most appropriate locations to yield a representative assessment of the nonfixed contamination levels. The amount of radioactivity measured on any single wiping material divided by the surface area wiped and divided by the efficiency of the wipe procedure may not exceed the limits set forth in **Table A3.4** at any time during transport. Other methods of assessment of equal or greater efficiency may be used.

A3.3.7.6.2. Inspecting Aircraft for Contamination. Periodically check aircraft used to routinely transport radioactive materials for radioactive contamination. Determine frequency of the checks based on the likelihood of contamination and the extent to which radioactive materials are carried aboard the aircraft. An aircraft must be taken out of service if the radiation dose rate at any accessible surface is 0.005 mSv/h (0.5

mrem/h) or if there is significant removable radioactive surface contamination as outlined above.

Table A3.4. Removable External Radioactive Contamination--Wipe Limits.

Contaminant	Maximum permissible limits		
	Bq/cm^2	uCi/cm^2	dpm/cm^2
Beta and gamma emitters and low toxicity alpha emitters.	4	10^{-4}	220
All other alpha emitting radionuclides	0.4	10^{-5}	22

A3.3.7.7. Transport Index and Criticality Safety Index (CSI).

A3.3.7.7.1. Transport Index – Radiation Exposure Control.

A3.3.7.7.1.1. The TI for a package, overpack, or freight container is the number derived using the following procedure:

A3.3.7.7.1.1.1. Determine the maximum radiation level at a distance of 1 m from the external surfaces of the package, overpack, or freight container. If the radiation level is determined in units of millisievert per hour (mSv/h), then multiply the value by 100 to convert to units of millirem per hour (mrem/h). If the radiation level is determined in units of millirem per hour, then the value is not changed. For uranium and thorium ores and concentrates, the maximum radiation dose rate at any point 1 m from the external surface of the load may be taken as follows:

A3.3.7.7.1.1.1.1. For ores and physical concentrates of uranium and thorium - 0.4 mSv/h (40 mrem/h).

A3.3.7.7.1.1.1.2. For chemical concentrates of thorium – 0.3 mSv/h (30 mrem/h).

A3.3.7.7.1.1.1.3. For chemical concentrates of uranium, other than uranium hexafluoride – 0.02 mSv/h (2 mrem/h).

A3.3.7.7.1.1.2. For freight containers, the value determined in A3.3.7.7.1.1.1. must be multiplied by the appropriate factor from **Table A3.5**.

Table A3.5. Multiplication Factors for Freight Containers.

Largest Cross-Sectional Area of the Freight Container	Multiplication Factor
≤ 1 m^2	1
> 1 m^2 to ≤ 5 m^2	2
> 5 m^2 to ≤ 20 m^2	3
> 20 m^2	10

A3.3.7.7.1.1.3. The figure obtained in **A3.3.7.7.1.1.1** and **A3.3.7.7.1.1.2** must be rounded up to the first decimal place (e.g. 1.13 becomes 1.2), except that a value of 0.05 or less may be considered as zero.

A3.3.7.7.1.2. Transport Index – Consignment. The transport index for each

overpack or freight container must be determined as either the sum of the TIs of all the packages contained, or by direct measurement of radiation level, except in the case of non-rigid overpacks for which the transport index must be determined only as the sum of the TIs of all the packages.

A3.3.7.7.2. Determination of Criticality Safety Index (CSI). The criticality Safety Index (CSI) for packages containing fissile material is determined in accordance with the instructions provided in 10 CFR Part 71. The CSI for an overpack, freight container, or consignment or consignment containing fissile material packages is the sum of the CSIs of all the fissile material packages contained within the overpack, freight container or consignment.

A3.3.7.8. General Package Design Requirements.

A3.3.7.8.1. The packaging for the transport of radioactive material must provide the following:

A3.3.7.8.1.1. Containment to prevent contamination of people and the environment.

A3.3.7.8.1.2. Protection from radiation. The type of packaging depends on the amount and type of radiation (alpha, beta, gamma, neutron).

A3.3.7.8.1.3. Prevention of criticality in fissile material.

A3.3.7.8.1.4. Protection from internal heat generation.

A3.3.7.8.2. Design each package used for shipment of radioactive materials so that:

A3.3.7.8.2.1. The package can be easily handled and properly secured during transport.

A3.3.7.8.2.2. Each lifting attachment on the package, when used in the intended manner, with a minimum safety factor of three, does not impose an unsafe stress on the structure of the package. In addition, design the lifting attachment so that failure under excessive load does not impair the ability of the package to meet all other requirements of this attachment and **Attachment 11**. Remove, make inoperable for transport, or design with equivalent strength for lifting each attachment or other feature on the outer surface of the packaging that could be used to lift the package.

A3.3.7.8.2.3. The external surface, as far as practical, may be easily decontaminated.

A3.3.7.8.2.4. The outer layer of packaging avoids, as far as practicable, pockets or crevices where water might collect.

A3.3.7.8.2.5. Each feature that is added to the package at the time of transport, and is not a part of the package, does not reduce the safety of the package.

A3.3.7.8.2.6. The package will be capable of withstanding the effects of any acceleration, vibration, or vibration resonance that may occur during transportation without any deterioration in the effectiveness of any of the closing devices or in the integrity of the package and without loosening or unintentionally

releasing the nuts, bolts, or other securing devices.

A3.3.7.8.2.7. The package will be capable of withstanding, without leakage, an internal pressure that produces a pressure differential of not less than the maximum normal operating pressure plus 95 kPa (14 psi).

A3.3.7.8.2.8. The packaging materials and any components will be physically and chemically compatible with each other and the contents.

A3.3.7.8.2.9. All valves through which the package contents could escape will be protected against unauthorized operation.

A3.3.7.9. Additional Packaging Design Requirements for Type A and B Packages.

A3.3.7.9.1. In addition to meeting the general design requirements each Type A packaging must also meet the design requirements of 49 CFR §173.412 and test requirements of 49 CFR §173.461 and §173.465.

A3.3.7.9.2. Each type B(U) or type B(M) package must meet the design and test requirements of 10 CFR Part 71.

A3.3.7.9.3. Each shipper of a DOT 7A package must maintain on file for at least 1 year after the latest shipment complete documentation of tests and an engineering evaluation or comparative data showing that the construction methods, packaging design, and materials of construction comply with that specification. Unless otherwise required, the shipper is exempt from maintaining this documentation if it is maintained by the Inventory Control Point (national stock number managing activity).

A3.3.7.10. Radiation Level and Thermal Limitations.

A3.3.7.10.1. Design each package of radioactive materials so that:

A3.3.7.10.1.1. The radiation level is not more than 2 mSv/h (200 mrem/h) at any point on the external surface of the package. 49 CFR §173.441

A3.3.7.10.1.2. The transport index is not over 10. 49 CFR §173.441

A3.3.7.10.2. Design, construct, and load each package of radioactive material so that:

A3.3.7.10.2.1. The heat generated within the package due to the radioactive contents will not, at any time during transportation, affect the integrity of the package under normal transportation conditions.

A3.3.7.10.2.2. The temperature of the accessible external surfaces of the loaded package will not, assuming still air in the shade at an ambient temperature of 38 degrees C (100 degrees F), exceed either a temperature of 50 degrees C (122 degrees F) in other than an exclusive use shipment or 85 degrees C (185 degrees F) in an exclusive use shipment.

A3.3.7.11. Types of Packaging. The types of packages used for radioactive material which are subject to the activity limits and material restrictions defined in A11.3., A11.5.8., A11.6.1., A11.7., and A11.10.1., and meet the corresponding requirements are as follows. Packages containing fissile material or uranium hexafluoride are subject to additional requirements (see A3.3.7.3.4. and A3.3.7.18).

A3.3.7.11.1. Excepted Packages.

A3.3.7.11.2. Industrial Package, Type 1 (Type IP-1 package).

A3.3.7.11.3. Industrial Package, Type 2 (Type IP-2 package).

A3.3.7.11.4. Industrial Package, Type 3 (Type IP-3 package).

A3.3.7.11.5. Type A Packages.

A3.3.7.11.6. Type B(U) and B(M) packages.

A3.3.7.11.7. Type C Packages.

A3.3.7.12. Subsidiary Risks.

A3.3.7.12.1. With the exception of UN2908, UN2909, UN2910, UN2911, UN2977, and UN2978, radioactive material with a subsidiary risk must meet the following:

A3.3.7.12.1.1. Be labeled with subsidiary risk labels corresponding to each subsidiary risk exhibited by the material. Corresponding placards must be affixed to transport units in accordance with the provisions of **Attachment 16**.

A3.3.7.12.1.2. Be allocated to Packing Groups I, II, or III, and if appropriate, by application of the grouping criteria in A4.2.4 corresponding to the nature of the predominant subsidiary risk.

A3.3.7.12.2. The basic description required on the Shipper's Declaration for Dangerous Goods must include a description of these subsidiary risks (e.g. "3, 6.1"), the name of the constituents which most predominantly contribute to the subsidiary risk(s), and where applicable, the packing group.

A3.3.7.12.3. Radioactive material with a subsidiary risk of Division 4.2 (Packing Group I) must be transported in Type B packages. Radioactive material with a subsidiary risk of Division 2.1 is forbidden from transport on passenger aircraft. Radioactive material with a subsidiary risk of Division 2.3 is forbidden from transport on passenger and cargo aircraft without a waiver or CAA, as appropriate.

A3.3.7.13. Radioactive Material in Excepted Packages. Radioactive material in excepted Packages (UN2909, UN2910, and UN2911) are not regulated by this manual when prepared according to A11.5 and marked according to A14.4.6.2. If this material meets the definition and criteria of other classes/divisions, it must be prepared and certified according to the applicable Identification Number (UN, NA, ID).

A3.3.7.14. Different Radionuclides in One Package. When different radionuclides are packaged together in the same package, the total activity must be determined in accordance with 49 CFR §173.433(d).

A3.3.7.15. Radioactive Material Packed With Other Items. A package containing radioactive material must not contain any other items except such articles and documents necessary for the use of the radioactive material, provided there is no interaction between them and the packaging or the radioactive contents that would reduce the safety of the package. LSA and SCO, however, may be packed with other items.

A3.3.7.16. Overpacks Containing Radioactive Material. The following applies:

A3.3.7.16.1. Packages of radioactive material may be combined together in an overpack for transport, provided that each package contained inside is packaged in accordance with this manual. Fissile material, however, which exceeds a transport index of zero must not be placed in an overpack.

A3.3.7.16.2. Only the original shipper of the packages contained in an overpack is permitted to use the method of direct measurement of radiation level to determine the transport index of the overpack.

A3.3.7.17. Requirements for Foreign-Made Packages. In addition to the requirements of **Attachment 11**, each shipper of a foreign-made type B(U), type B(M), type C, type CF, type H(U), type H(M) or fissile material package for which a competent authority certificate is required by the IAEA "Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1" must meet the requirements of 49 CFR §173.473.

A3.3.7.18. Uranium Hexafluoride (Fissile and Low Specific Activity). In addition to any other applicable requirements of **Attachment 11**, package uranium hexafluoride, fissile or low specific activity, according to the requirements identified in 49 CFR §173.420:

A3.3.7.18.1. Clean packages before initial filling and during periodic inspection and tests.

A3.3.7.18.2. Design, fabricate, inspect, test, and mark packagings according to 49 CFR §173.420.

A3.3.7.18.3. Ensure uranium hexafluoride is in solid form when offered for transportation.

A3.3.7.18.4. The volume of the solid uranium hexafluoride at 20 degrees C (68 degrees F) must not exceed 61 percent of the volumetric capacity of the package.

A3.3.7.18.5. Ensure the pressure in the package at 20 degrees C (68 degrees F) is less than 101.3kPa (14.8 psig).

A3.3.7.18.6. Periodically inspect, test, and mark packages of uranium hexafluoride in accordance with 49 CFR §173.420.

A3.3.7.18.7. Perform repairs to package(s) of uranium hexafluoride according to 49 CFR §173.420.

A3.3.8. Class 8.

A3.3.8.1. General Handling Instructions for Corrosive Materials.

A3.3.8.1.1. Store corrosive materials in a cool, well ventilated area away from sources of heat and oxidizing agents.

A3.3.8.1.2. Both the vapor and the liquid are corrosive and irritating and may cause burns to the body and damage to aircraft.

A3.3.8.1.3. Properly placard the storage area.

A3.3.8.1.4. Ensure protective masks or respirators, rubber gloves, goggles, and other protective clothing as required are readily available. Contact Safety and/or Medical Services as appropriate for specific protective requirements.

A3.3.8.2. Packaging. Unless otherwise specified by a packaging paragraph, package a liquid material identified as PG III in **Table A4.1** in a container that meets the PG I or II performance level.

A3.3.8.3. Packed with Other Materials. Do not pack bottles containing corrosive liquids in the same outer packaging with other hazardous materials.

A3.3.8.4. Hypochlorite Solution. Hypochlorite solution is not regulated by this manual if the chemical and physical properties, when tested, do not meet the criteria established for corrosive material. Comply with **paragraph A3.1.16.4** to identify non-regulated hypochlorite solutions (e.g., liquid bleaches tested according to 49 CFR §173.137).

A3.3.8.5. Fuel Cell Cartridges.

A3.3.8.5.1. Fuel cell cartridges design types using liquids as fuels must pass an internal pressure test at a pressure of 15 psig (100 kPa (gauge) without leakage.

A3.3.8.5.2. Each fuel cell cartridge design type must pass a 1.2 m drop test onto an unyielding surface in the orientation most likely to result in failure of the containment system with no loss to the contents.

A3.3.8.5.3. A fuel cell cartridge may contain an activator provided it's fitted with two independent means of preventing unintended mixing with the fuel during transportation.

A3.3.9. Class 9.

A3.3.9.1. General Handling Instructions. Class 9 material is generally considered less hazardous than other hazard classes due to the final form of the packaged material or item for transportation. However, Class 9 materials present a unique and equally hazardous situation during air transport. Personnel must exercise care when handling this material and ensure specific handling instructions located in the packaging paragraphs are observed.

A3.3.9.2. Lithium Batteries. Lithium cells or batteries must be of a design type proven to meet the requirements of the UN Manual of Tests and Criteria. Maintain a record of satisfactory completion of these tests prior to offering the cell or battery for transport. Manufacturers retain this record for as long as that lithium battery design type is offered for transportation and for one year thereafter.

A3.3.9.2.1. Lithium Batteries must:

A3.3.9.2.1.1. Incorporate a safety venting device or otherwise be designed in a manner that will preclude a violent rupture under conditions normally incident to transportation;

A3.3.9.2.1.2. Be equipped with an effective means to prevent dangerous reverse current flow (e.g., diodes, fuses, etc.) if a battery contains cells or a series of cells that are connected in parallel; and

A3.3.9.2.1.3. Be equipped with an effective means of preventing external short circuits and the evolution of a dangerous amount of heat (i.e. an amount of heat sufficient to be dangerous to packaging or personal safety to include charring, melting or scorching of packaging, or other evidence).

A3.3.9.2.2. Lithium Batteries identified as defective for safety reasons (i.e. manufacturer recall) or have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are prohibited from air movement.

A3.3.9.2.3. Non-Regulated Lithium Batteries. Lithium batteries are not subject to any other requirements of this manual (except **paragraphs A3.1.16.4**, **A3.3.9.2**, **A3.3.9.2.1**, and **A3.3.9.2.2**) if the cells and batteries have a lithium content of not more than 0.3 grams or a watt-hour rating of not more than 3.7 Wh when they are packed with or contained in equipment and packages as follows:

A3.3.9.2.3.1. The cells or batteries must be packed to prevent short circuits, including shifting that could lead to short circuits.

A3.3.9.2.3.2. The equipment, cells, and batteries must be packed in a strong outer packaging that is waterproof or is made waterproof through the use of an inner packaging or a liner unless the equipment is made waterproof by nature of its construction.

A3.3.9.2.3.3. The package may contain no more than the number of lithium cells or batteries necessary to power the piece of equipment plus two spare cells or batteries.

A3.3.9.2.4. Excepted Lithium Batteries. Lithium batteries are not subject to any other requirements of this manual when prepared according to this section.

A3.3.9.2.4.1. Lithium ion cells limited to not more than 20Wh and batteries limited to not more than 100 Wh.

A3.3.9.2.4.2. Lithium metal or alloy cells limited to not more than 1 g and batteries limited to not more than 2 g.

A3.3.9.2.4.3. Cells and batteries must be packed in strong outer packagings that meet the requirements of **3.1** and:

A3.3.9.2.4.3.1. Completely encloses the cell or battery in a manner that prevents accidental activation of the power source during transport.

A3.3.9.2.4.3.2. Is capable of withstanding a 1.2 m drop test in any orientation without damage to the cells or batteries, shifting that allows cell to cell or battery to battery contact, or a release of the contents.

A3.3.9.2.4.4. Each package must have an accompanying document that identifies:

A3.3.9.2.4.4.1. The package contains lithium cells or batteries.

A3.3.9.2.4.4.2. The package must be handled with care and a flammability hazard exists if the package is damaged.

A3.3.9.2.4.4.3. Special procedures to include repacking procedures if the package is damaged.

A3.3.9.2.4.4.4. A telephone number to contact for additional information.

A3.3.9.2.4.5. Each package must be labeled with the lithium battery handling

label

A3.3.9.2.4.6. Marked in accordance with A14.4.8.5. Markings do not prohibit the movement of passengers on military or contracted cargo aircraft.

A3.3.9.2.4.7. Cells and batteries must comply with the other requirements of this paragraph (**A3.3.9.2** except paragraph **A3.3.9.2.3**).

A3.3.9.2.5. Except when authorized in **paragraph A13.8**, cells or batteries with liquid cathodes containing sulfur dioxide, sulfuryl chloride or thionyl chloride (not properly installed in equipment) may not be offered for transportation or be transported, if any cell has been discharged to the extent that the open circuit voltage is less than two volts or is less than two-thirds of the voltage of the fully charged cell, whichever is less. Liquid cathode batteries with voltage above these limits may be shipped in the same manner as a new battery.

A3.3.9.2.6. A lithium cell or battery that does not conform to the provisions of this manual may be transported only under conditions approved by the competent authority.

A3.3.9.3. Magnetized Material. Any package that has a magnetic field strength of more than 0.00525 gauss measured at 4.5 m (15 ft) from any surface of the package is forbidden on military aircraft.

A3.3.9.4. Vehicles and SE.

A3.3.9.4.1. Fuel levels for vehicles, engines, equipment, and other mechanical devices will be determined by the technical directive used to prepare the item for air movement. However, fuel levels cannot exceed limits established in **Attachment 13**. When technical directives do not specify fuel levels for shipment, the requirements of **Attachment 13** apply. Actual fuel levels will be determined by a fuel gauge. In absence of an operational fuel gauge, use a graduated dip stick. If positive means is not available to accurately determine fuel level, drain or siphon the tank. The tank may be refilled to appropriate level in the presence of an inspector (see **paragraph A28.1.2**).

A3.3.9.4.2. Do not remove other hazardous materials from their packaging and store in the racks or containers of vehicles or equipment unless authorized by **paragraph A5.3**.

A3.3.9.4.3. Fire Suppression Systems. Vehicles and equipment integral fire suppression systems will be safed, secured, or disabled to prevent accidental activation during transportation.

A3.3.9.5. Unregulated Engines and Fuel Components. The following items when drained, purged, and containing no other hazardous materials are nonhazardous for transportation. Comply with **paragraph A3.1.16.4**.

A3.3.9.5.1. Vehicles and internal combustion engines, with or without fuel tanks attached, prepared for shipment according to applicable technical directives or standards. Fuel systems including carburetors, pumps, controls, and fuel tanks must be completely drained, purged, and sealed with appropriate pressure seal type plug and caps with gaskets and “O” rings.

A3.3.9.5.2. Aircraft engines which are drained and purged according to the responsible technical manual, and containing no other hazardous materials.

A3.3.9.5.3. Fuel tanks, and cells that are drained, purged, and sealed according to the applicable technical directive.

A3.3.9.5.4. All preserved and packed serviceable fuel assemblies, for example, carburetors, fuel pumps, filters, etc., that are drained and purged of all fuel. In addition, they must be sealed with proper caps, plugs, and covers according to the applicable technical directive. Use a barrier bag to contain residual purging fluid. Mark the type of purging fluid used and the flash point on the outer container.

A3.3.9.6. Dry Ice.

A3.3.9.6.1. Properties of Carbon Dioxide, Solid. At temperatures above -78.5 degrees C (-109.3 degrees F) dry ice will sublimate and release carbon dioxide fumes. If the carbon dioxide concentration in the aircraft is over 0.5 percent, crewmembers may suffer shortness of breath. Carbon dioxide concentrations of 3.0 percent are endurable from 1/2 to 1 hour. Concentrations of 5.0 percent are dangerous from 1/2 to 1 hour and concentrations of 9.0 percent are fatal from 5 to 10 minutes. Carbon dioxide is heavier than air; therefore, the highest concentration is at or near floor level. Caution crewmembers against lying on the cargo compartment floor or remaining in the cargo compartment for a prolonged period. If symptoms of overexposure are noted, use oxygen and increased ventilation to provide rapid relief.

A3.3.9.6.2. Seat passengers forward of and separate by the greatest distance possible (minimum one full pallet position) from dry ice.

A3.3.9.6.3. Passenger and crewmembers will not occupy the same pallet position as dry ice.

A3.3.9.6.4. Do not carry dry ice (exceeding passenger acceptable carry-on quantities specified in **Attachment 22**) in any upper deck compartment.

A3.3.9.6.5. Vent the aircraft cargo compartment to the greatest extent possible allowed by the flight profile and environmental conditions.

A3.3.9.6.6. Quantity limits specified in this paragraph apply to all personnel, other than aircrew members, who occupy the cargo compartment with dry ice. Aircrew members entering cargo compartments exceeding quantity limits specified in this paragraph must take precautions to prevent oxygen deprivation (i.e. oxygen masks).

A3.3.9.6.7. Pressurized Aircraft. For pressurized aircraft, the amount of dry ice that can be safely shipped by air regardless of the type container used depends on the sublimation rate of the ice, the volume of the aircraft, and the number of air changes per hour. To minimize the sublimation rate, use insulated containers surrounded with insulating blankets and tarpaulin during shipment to the greatest extent possible. To determine the amount of dry ice that can be safely shipped by air, use the formula in **Figure A3.6**.

A3.3.9.6.8. Aircraft on Minimum Air Changes. When aircraft is on minimum air changes per hour, safe loads are drastically reduced. When the aircraft is on the

ground longer than 45 minutes, recalculate the safe quantity using new numbers of air changes per hour. Maximum quantities are shown in **Figure A3.7** and **Figure A3.8**.

Figure A3.6. Formula For Determining Dry Ice Limitations.

$$X = \frac{VA(0.47)}{32.3}$$

Where:

V = Volume of aircraft

A = Air changes per hour

X = Maximum dry ice loading in pounds

Figure A3.7. Dry Ice Limitations When Aircraft is on Minimum Air Changes.

Aircraft	Maximum Amount	
Type	in Pounds	Kilograms
C-130	600	272
C-135	200	91

Figure A3.8. Maximum Quantities for Dry Ice Aboard C-17 Aircraft.

	Maximum Amount in Pounds	Maximum Amount in Kilograms
Two Packs High Flow Setting at 35,000 feet	3,430	1,556
Two Packs High Flow Setting at 10,000 feet or less	2,080	943
Two Packs Normal Flow Setting at 35,000 feet	1,880	853
Two Packs Normal Flow Setting at 10,000 feet or less	1,040	472
One Pack High Flow Setting at 35,000 feet	1,720	780
One Pack High Flow Setting Holding at 10,000 feet	1,040	472

NOTE: Above quantities are the maximum amounts for operating with no passengers in the cargo compartment. Limitation with passengers in the cargo compartment is set at 1,040 pounds (472 kilograms) for both high and normal flow.

A3.3.9.6.9. Non-pressurized Aircraft. For non-pressurized aircraft, the amount of dry ice that can be safely shipped by air depends upon the sublimation rate and ventilation of the aircraft. To minimize the sublimation rate, use insulated containers surrounded with insulating blankets and tarpaulins. The aircraft must have maximum ventilation

during the shipment. With unpressurized cargo compartment, the quantity of dry ice that can be transported is unlimited if the fumes are vented overboard the aircraft. Maximum quantities aboard a C-5 aircraft are shown in **Figure A3.9**.

Figure A3.9. Maximum Quantities for Dry Ice Aboard C-5 Aircraft.

	Maximum amount in Pounds	Maximum Amount in Kilograms
Cruise (mach 0.5 and up) and altitudes up to 30,000 feet (Note 1)	4,700	2,132
Cruise (mach 0.6 and up) and altitudes up to 30,000 feet (Note 1)	3,120	1,415
During Non-pressurized up to 10,000 feet (Note 2)	6,500	2,948
During Ground Operations with one auxiliary power unit (Note 3)	2,950	1,338

NOTES:

1. The Environmental Control System (ECS) must be operated with “both” air conditioning units on a “Normal” flow control valve and the “Intermediate” setting on the alternative air valve.

2. The auxiliary vent value must be open for this condition.

3. The air turbine motor is at idle. The auxiliary vent valve must be open for this condition.

A3.3.9.6.10. KC-10 Aircraft. Dry ice may be carried in the KC-10 cargo compartment under the following aircraft operating conditions:

A3.3.9.6.10.1. If "one" air conditioning pack is lost in flight, then accomplish emergency procedures for cabin. Turn Cargo Smoke Light on per KC-10 flight manual T.O. 1C-10(K)A-1, Section II. Include "Smoke Source is not Accessible" portion of procedure except do not put cabin pressure control in manual and do not depressurize cabin.

A3.3.9.6.10.2. Environmental curtain at station 615 or 879: If "one" air conditioning pack is lost in flight, then accomplish emergency procedures for cabin, turn cargo smoke light on, mixed passenger and cargo configuration per KC-10 flight manual T.O 1C-10(k) A-1, section II, except do not initiate firefighting procedures.

A3.3.9.6.10.3. During cargo loading, the following procedures apply to minimize carbon dioxide concentration:

A3.3.9.6.10.3.1. Ensure APU is running and "both" air conditioning packs are operating.

A3.3.9.6.10.3.2. Open number 4 passenger service door for additional ventilation.

A3.3.9.6.10.3.3. Open all air inlets in the aerial refueling operator’s station and close aerial refueling operators hatch.

A3.3.9.6.10.3.4. Ensure environmental curtain is closed before flight.

A3.3.9.6.10.3.5. Transport maximum quantities as shown in **Figure A3.10**.

Figure A3.10. Maximum Quantities for Dry Ice Aboard KC-10 Aircraft.

	Maximum amount in Pounds	Maximum Amount in Kilograms
No environmental curtain (27 pallet all-cargo configuration):		
Both packs operating	2,295	1,041
One pack operating	1,251	568
Environmental curtain at station 615:		
Both packs operating	1,782	808
One pack operating	969	440
Environmental curtain at station 879:		
Both packs operating	1,204	546
One pack operating	653	296

A3.3.9.6.11. AMC Contract Aircraft. Do not transport more than 440 pounds (200 kilograms) of dry ice in a cargo compartment of AMC contract aircraft without prior approval from the individual air carrier.

A3.3.9.6.12. Packaging. Use fiberboard boxes, polystyrene foam containers, or other suitable packaging designed and constructed to permit the release of carbon dioxide gas and to prevent a build-up of pressure that could rupture the packaging. Use UN specification packaging when required by this manual.

A3.3.9.7. Consumer Commodities. Inner packagings containing hazardous liquids re-classified as a Consumer Commodity must be capable of meeting internal air gauge pressure requirements of A3.1.7.1.

A3.4. Household Goods (HHG) Shipments. DTR 4500.9-R, Part IV, *Personal Property* establishes requirements for the movement of HHG and specifies that hazardous materials are not authorized for military airlift. One exception is that engine power-driven equipment (motorcycle, moped, lawnmower, boat, snowmobile, etc.) may be transported as HHG under the following requirements:

A3.4.1. Completely drain all fuel.

A3.4.2. Run until the engine stalls.

A3.4.3. Drain all oil and cooling fluids.

A3.4.4. Allow fuel tanks and lines to remain open for at least 24 hours prior to pickup.

A3.4.5. Disconnect non-spillable gel-type batteries and tape the ends to prevent short circuit. Batteries may remain in the equipment holder, but ensure they are firmly secured and remain upright in the shipping container. Do not ship batteries with acid or alkali.

A3.4.6. Engine power-driven equipment prepared in this manner are not regulated by this manual. A Shipper's Declaration for Dangerous Goods is not required.

Attachment 4

ITEMS LISTING

A4.1. General Requirements. This attachment contains :

A4.1.1. An alphabetical listing of the hazardous materials subject to the requirements of this manual. See **paragraph A3.1.16** for material determined to be nonhazardous.

A4.1.2. Classification criteria for hazard classes. See **Attachment 1** for definitions.

A4.1.3. Identification of items prohibited for military air transportation.

A4.1.4. Listing of Hazardous Substances and applicable Reportable Quantities.

A4.2. Classifying Hazardous Materials.

A4.2.1. Hazard Class Names. The hazard class and division is a numerical identification which describes the class (type) of primary hazard involved and if appropriate, its division within the class. Use the Hazardous Material Information Resource System (HMIRS), product Material Safety Data Sheet, or other manufacturer's information if assistance in determining the hazard classification is needed. **Figure A4.1** lists class and division numbers and the corresponding class and division names.

Figure A4.1. Hazard Classes.

HAZARD CLASS/ DIVISION NUMBER	HAZARD CLASS/ DIVISION NAME	HAZARD CLASS/ DIVISION NUMBER	HAZARD CLASS/ DIVISION NAME
1.1	Explosives (with mass explosion hazard)	**4.1**	Flammable solid
1.2	Explosives (with a projection hazard)	**4.2**	Spontaneously combustible material
1.3	Explosives (with predominately a fire hazard)	**4.3**	Dangerous when wet material
1.4	Explosives (with no significant blast hazard)	**5.1**	Oxidizer
1.5	Very insensitive explosives; blasting agents	**5.2**	Organic peroxide
1.6	Extremely insensitive detonating substances	**6.1**	Poisonous (toxic) material
2.1	Flammable gas	**6.2**	Infectious substances (etiologic agents)
2.2	Nonflammable gas	**7**	Radioactive material
2.3	Poisonous gas	**8**	Corrosive material
3	Flammable liquid	**9**	Miscellaneous hazardous material

A4.2.2. Items Not Specifically Listed. If a material is not specifically listed in **Table A4.1**, determine the PSN by comparing the characteristics of the items with the definitions of the various hazard classes in this manual. Assign a "Not Otherwise Specified" (N.O.S.) name based on the hazard class of the material. Examples are: "FLAMMABLE LIQUID, N.O.S.; CORROSIVE SOLID, N.O.S." **Attachment 1** contains hazardous class definitions. Determine the appropriate technical name according to **A4.5.2**.

A4.2.3. Tentative PSN Assignment. A material for which the hazard class must be determined by testing, or a material that is a hazardous waste, the shipper may assign a tentative shipping name, based on:

A4.2.3.1. The defining criteria of the hazard class.

A4.2.3.2. The hazard precedence prescribed in **A4.2.4**.

A4.2.3.3. The shipper's knowledge of the material.

A4.2.3.4. A3.3.1.4. for new explosives.

A4.2.3.5. If a N.O.S. PSN is assigned, a technical name is not required.

A4.2.4. Precedence of Hazard. Assign any material specifically identified and listed in **Table A4.1**. the hazard class identified in column 3 of **Table A4.1**. Use other resources identified in A4.2.1. to determine the appropriate hazardous material description. If required, classify a hazardous material that is not specifically identified and listed in **Table A4.1** (or is a mixture of materials), and meets the definition of more than one hazard, according to the following order of precedence:

A4.2.4.1. Class 7 (Radioactive material, other than limited quantities). When limited quantities are involved the other hazardous properties take precedence.

A4.2.4.2. Class 1 (explosives).

A4.2.4.3. Class 2.3 (poisonous gas).

A4.2.4.4. Class 2.1 (flammable gas). See also Class 9.

A4.2.4.5. Class 2.2 (nonflammable gas). See also Class 9.

A4.2.4.6. Class 5.2 (organic peroxide).

A4.2.4.7. Class 6.2 (infectious substances or etiologic agents).

A4.2.4.8. Class 4.1 (flammable solid). Only self-reactive substances and wetted explosives.

A4.2.4.9. Class 4.2 (substances liable to spontaneous combustion). Only pyrophoric substances.

A4.2.4.10. Class 6.1 (poisonous substances), PG I, poisonous by inhalation only.

A4.2.4.11. Small quantities of compressed gas such as starter fluid (Class 2.1) or fire extinguisher (Class 2.2) installed on a vehicle do not take precedence over the flammable liquid (Class 3).

A4.2.4.12. If required, classify other hazardous materials not identified above according to 49 CFR §173.2a.

A4.2.5. Hazard Classification of Class 5.2 Organic Peroxides. Class 5.2 organic peroxides are categorized into one of seven "types" in a system of generic proper shipping names. The generic PSN for the organic peroxide describes the physical state of the material (i.e., liquid or solid), provides an indication of controlled temperature requirements, and includes the "type" of the organic peroxide. The seven types of organic peroxides are described in **Attachment 1**. Transport all Class 5.2 material under one of the generic proper shipping names listed in **Table A4.1** beginning with the words "ORGANIC PEROXIDE". Technical names are listed below each PSN in lower case letters. To determine the correct PSN:

A4.2.5.1. Find the technical name in **Table A9.1** and select the UN identification number assigned to the technical name that best describes the item (in terms of concentration ranges, physical characteristics, etc.).

A4.2.5.2. Turn to the "ORGANIC PEROXIDE" listed in **Table A4.1**. These entries constitute the "generic" organic peroxide proper shipping names.

A4.2.5.3. Match the UN identification number for the technical name with a UN identification number associated with the generic PSN.

A4.2.5.4. The generic PSN associated with organic peroxides will include the "type" under which the organic peroxide falls. Organic peroxide types are defined in **Attachment 1**.

A4.2.6. Hazard Classification of Fissile Materials. Except as provided in A3.3.7.11. classify each package of fissile materials as fissile class I, II, or III. Determine the numerical values for package assignments as fissile class I, the transport indexes for fissile class II packages, and the conveyance limitations for fissile class III shipments according to 10 CFR Part 71.

A4.2.6.1. Fissile Class I. Packages may be transported in unlimited numbers, and in any arrangement, and require no nuclear criticality safety controls during transportation. A transport index is not assigned to fissile class I packages for the purpose of nuclear criticality safety control, although, the external radiation levels may require a transport index number.

A4.2.6.2. Fissile Class II. Packages may be transported together in any arrangement, but in numbers that are not over an aggregate transport index of 50. For the purposes of nuclear criticality safety control, individual packages may have a transport index of not less than 0.1 and not more than 10. However, the external radiation levels may require a higher transport index number. These shipments require no nuclear criticality safety control by the shipper during transportation.

A4.2.6.3. Fissile Class III. Shipments of packages of fissile materials that do not meet the requirements of fissile class I or fissile class II and are controlled in transit as prescribed in **Attachment 3** by appropriate arrangements between the shipper and the carrier.

A4.3. Determining Degree of Hazard (PG). For most material, the PG is assigned in column 5 of **Table A4.1**. Packing groups I, II, and III indicate the degree of hazard associated with the materials and are used to identify the severity of UN specification performance tests associated with the packaging for the item. Poisonous by inhalation material are assigned hazard zones (see

Attachment 1) in **Table A4.1**. If unknown, the PG or hazard zone may be determined according to this paragraph. Class 2, and 7 do not have packing groups.

A4.3.1. Class 2 Hazard Zone. The hazard zone of a Class 2.3 material is given in column 7 of **Table A4.1**. When column 7 of **Table A4.1** provides more than one hazard zone or is blank, determine the hazard zone from **Figure A4.2**. There are no hazard zones for Class 2.1 and 2.2.

Figure A4.2. Determination of Hazard Zone for Class 2.3.

Hazard Zone	Inhalation Toxicity (parts per million)
A	LC_{50} less than or equal to 200 ppm
B	LC_{50} greater than 200 ppm and less than or equal to 1000 ppm
C	LC_{50} greater than 1000 ppm and less than or equal to 3000 ppm
D	LC_{50} greater than 3000 ppm or less than or equal to 5000 ppm

A4.3.2. Class 3 Packing Groups. When **Table A4.1** lists more than one PG for a material, or indicates that the PG is to be determined on the basis of the PG criteria for Class 3, determine the PG by using **Figure A4.3**. To use **Figure A4.3**, match the initial boiling point and flash point of the material to the corresponding PG. Flash points may be determined from the material safety data sheet, the Hazardous Material Information Resource System (HMIRS), the National Fire Protection Guide, or markings on the package. For example, a Class 3 material with an initial boiling point of 38 degrees C (100 degrees F) and a flash point of 25 degrees C (77 degrees F) would be assigned a PG III. If the initial boiling point is less than or equal to 35 degrees C (95 degrees F), assign PG I. Viscous Class 3 material (i.e., paints, varnishes, enamels, lacquers, adhesives, and polishes) in PG II with a flash point of less than 23 degrees C (73 degrees F) may be grouped in PG III provided the requirements of 49 CFR §173.121(b) are met.

Figure A4.3. Criteria for Class 3 PG.

PG	Flash Point (closed-cup)	Initial Boiling Point
I		less than or equal to 35°C (95°F)
II	less than 23°C (73°F)	greater than 35°C (95°F)
III	equal to or greater than 23°C (73°F) but less than or equal to 60°C (140°F)	greater than 35°C (95°F)

A4.3.3. Class 4 Packing Groups. When **Table A4.1** indicates that the PG of the material is to be determined on the basis of test criteria for Class 4 material, the test methods and appropriate criteria must comply with 49 CFR §173.125.

A4.3.4. Class 5 Packing Groups. When column 5 of **Table A4.1** is blank for a solid in Class 5.1, determine the PG based on the test criteria found in 49 CFR §173.127. If column 5 is

blank for a liquid in Class 5.1, packing groups can be assigned by a comparison to existing entries in **Table A4.1**.

A4.3.5. Class 6 Packing Groups and Hazard Zone. When **Table A4.1**., column 5 provides more than one PG and hazard zone for a specific Class 6.1 material, determine the PG and hazard zone by applying the following criteria:

A4.3.5.1. Determine the PG assignment for other than inhalation of vapors by using **Figure A4.4**.

A4.3.5.2. Determine the PG and hazard zone assignments for inhalation of vapors by using **Figure A4.5**.

Figure A4.4. PG Assignment For Other Than Inhalation of Vapors.

PG	Oral Toxicity LD_{50}(mg/kg)	Dermal Toxicity LD_{50} (mg/kg)	Inhalation Toxicity by Dusts and Mists LC_{50} (mg/L)
I	≤ 5	≤ 50	≤ 0.2
II	> 5 and ≤ 50	> 50 and ≤ 200	> 0.2 and ≤ 2.0
III	> 50 and ≤ 300	> 200 and ≤ 1000	> 2 and ≤ 4.0

Figure A4.5. Inhalation Toxicity.

Packing Group	Vapor Concentration and Toxicity
I (Hazard Zone A)	$V \geq 500\ LC_{50}$ and $LC_{50} \leq 200$ mL/m^3
I (Hazard Zone B)	$V \geq 10\ LC_{50}$ and $LC_{50} \leq 1000$ mL/m^3, and the criteria for PG I, Hazard Zone A are not met
II	$V \geq LC_{50}$ and $LC_{50} \leq 3000$ mL/m^3, and the criteria for PG I are not met
III	$V \geq .2\ LC_{50}$ and $LC_{50} \leq 5000$ mL/m^3, and the criteria for PG I and PG II are not met

A4.3.5.3. "V" is the saturated vapor concentration in air of the material in mL/m^3 at 20 degrees C (68 degrees F) and standard atmospheric pressure.

A4.3.5.4. When the PG determined by **Figure A4.4** and **Figure A4.5** is different for two or more (oral, dermal, inhalation) requirements, the PG assigned to the material is the highest degree of toxicity identified.

A4.3.5.5. Compute the PG and hazard zone for Class 6.1 mixtures that are poisonous (toxic) by inhalation as identified in 49 CFR §173.133 (b).

A4.3.6. Class 8 Packing Groups. When **Table A4.1**. lists more than one PG for a material, determine the PG as follows:

A4.3.6.1. Packing Group I. Substances that cause full thickness destruction of intact skin tissue within an observation period of up to 60 minutes starting after an exposure time of 3 minutes or less.

A4.3.6.2. Packing Group II. Substances that cause full thickness destruction of intact skin tissue within an observation period of up to 14 days starting after an exposure time of more than 3 minutes, but not more than 60 minutes.

A4.3.6.3. Packing Group III. Substances are assigned to Packing Group III if they meet one of the following:

A4.3.6.3.1. Substances that cause full thickness destruction of intact skin tissue within an observation period of up to 14 days starting after an exposure time of more than 60 minutes but less than 4 hours.

A4.3.6.3.2. Substances which are judged not to cause full thickness destruction of intact skin tissue but which exhibit a corrosion rate on steel or aluminum surfaces exceeding 6.25 mm (1/4 inch) a year at a test temperature of 55 degrees C (130 degrees F).

A4.4. Hazardous Substances. **Table A4.3** identifies materials that are designated hazardous substances under Section 101 (14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). See **Attachment 1** for a detailed definition of a hazardous substance. Ensure review of **Table A4.3** to determine if a material is a hazardous substance.

A4.4.1. Determine if the material is a hazardous substance by identifying the reportable quantity (RQ) in **Table A4.3**. The RQ is used to determine if material is a hazardous substance. The material is a hazardous substance if the amount in one package equal or exceeds the RQ quantity. **Table A4.3** specifies, in pounds and kilograms, the minimum quantity of the material that constitutes an RQ. For example: sodium arsenate (RQ-1.0/0.454) means the RQ is 1.0 pound or 0.454 kilograms.

A4.4.2. A substance or solution is a "hazardous substance" when the concentration by weight equals or exceeds the concentration listed in **Figure A1.1**.

A4.4.3. If the technical name of the hazardous substance appears in **Table A4.1**, then the technical name is the PSN. If the hazardous substance does not appear in **Table A4.1** and is not a forbidden material, select an appropriate generic (N.O.S.) PSN. Specify the technical name in parenthesis after the PSN. See **Attachment 17** for certification requirements.

A4.4.4. For Radionuclides, see 49 CFR §172.101, Appendix A.

A4.5. Using **Table A4.1**. **Table A4.1**. identifies "hazardous materials" for the purpose of military air transportation. To use **Table A4.1**. locate the proper shipping name (PSN) of the hazardous material and follow the information identified on the same line with the PSN. Use **Table A4.1**. to identify the following: eligibility of material for shipment, identification number, proper shipping name (PSN), hazard class and division, subsidiary risk, packing group (PG), special provisions applicable to the material (including passenger eligibility), and packaging paragraph.

A4.5.1. Column 1: Symbols. Column 1 contains symbols that pertain to the PSN.

A4.5.1.1. The letter "D" means that the PSN applies only to domestic shipments. These items are also identified by "NA" numbers in column 4. For international shipments, select an alternate PSN that is not preceded by a "D".

A4.5.1.2. The "" (star) identifies that a technical name is required in association with the PSN.

A4.5.1.3. The “+” (plus) fixes the proper shipping name, hazard class and packing group for that entry without regard to whether the material meets the definition of that class or packing group or meets any other hazard class definition.

A4.5.2. Column 2: Identification Number. Column 2 lists the identification number assigned to each PSN.

A4.5.2.1. Ship items classified with "UN" or "ID" (identification) numbers domestically or internationally.

A4.5.2.2. Ship items classified with "NA" (North American) numbers domestically only, or to and from Canada or Mexico. Use of “UN” numbers is preferred even for domestic shipment.

A4.5.2.3. New or revised UN or NA numbers in 49 CFR Part 172, ICAO, or IATA are recognized for use with this manual.

A4.5.3. Column 3: Proper Shipping Names (PSN). PSNs are listed alphabetically in all bold capital letters in **Table A4.1**. Use either singular or plural wording. New and revised PSNs in 49 CFR Part 172, ICAO, or IATA are authorized PSNs under this manual, provided the packaging requirements do not change. Alternate accepted spelling may be used provided the correct associated UN/ID number is used (e.g., “UN1350, SULFUR” vice “UN1350, SULPHUR”). A PSN modifier which appears as lower case italicized letters are descriptive words which may be used, but are not required as part of the PSN.

A4.5.3.1. Technical or Chemical Group Names. Provide a technical or chemical group name in association with the PSN when required by an “” in column 1.

A4.5.3.1.1. Organic Peroxides. Use technical names listed below the appropriate generic PSN (in lower case letters) in **Table A4.1**. See A4.2.5. for PSN assignment based on technical name.

A4.5.3.1.2. Mixtures and Solutions. If the hazardous material is a mixture or solution of two or more hazardous materials, enter the technical names of at least two components most contributing to the hazards of the mixture or solution in parentheses after the PSN.

A4.5.3.2. The Word "OR" in **Table A4.1**. The word "or" in a sequence of PSNs means that PSNs in the sequence are synonymous. Therefore, use of any one of the PSNs in the series is appropriate. Select only one PSN in the series when classifying the shipment. For Class 1 material, use the PSN listed in the JHCS.

A4.5.3.3. The Word "SEE" in **Table A4.1**. When one item references another item (by use of the word "see") and both names are in capital letters, use either name as the PSN. Forbidden designations and passenger restrictions applicable to the referenced entry also apply to the "see" entry.

A4.5.3.4. The Words “SOLUTION” or “MIXTURE”. A mixture or solution containing a hazardous material listed by name in **Table A4.1** together with one or more materials not

subject to this manual must be identified by the PSN of the hazardous material. Add the qualifying word “solution” or “mixture” to the PSN. (See 49 CFR §172.101(c) (10))

A4.5.3.5. Concentration Ranges. When a shipping name includes a concentration range as part of the shipping description, the actual concentration shipped (if it is in the range stated) may be used in place of the concentration range. For example, ship a hydrogen peroxide solution containing 30 percent peroxide as either "Hydrogen peroxide aqueous solution (with not less than 20 percent but not more than 40 percent hydrogen peroxide)" or "Hydrogen peroxide aqueous solution (with 30 percent hydrogen peroxide)."

A4.5.3.6. Hazardous Wastes. The PSN for a hazardous material that is a hazardous waste must include the word "WASTE" preceding the name of the material (i.e., WASTE, ACETONE). Comply with all requirements of this manual identified for the hazardous material when shipped as waste.

A4.5.4. Column 4: Hazard Class/Division. Column 4 contains:

A4.5.4.1. Primary hazard class and division numbers. When this manual references hazard class, that includes any division number if appropriate. For Class 1 (explosives), the compatibility group is also given. See A4.2. for additional information on class/divisions.

A4.5.4.2. Some items that contain explosive material may be assigned to a classification other than Class 1 by DOD explosives hazard classification approval authorities due to the predominant hazard (see A3.3.4.4). Compatibility group letters assigned to non-Class 1 material do not apply to military air transportation.

A4.5.5. Column 5: Subsidiary. Column 5 identifies the hazard class/division of any subsidiary risk posed by a material. Subsidiary risk may vary, depending on the applicable PG.

A4.5.6. Column 6: Packing Group (PG). Column 6 specifies one or more packing groups assigned to each PSN and hazard class. Hazard classes 2, 7, and ORM-D do not have packing groups. See A4.3. for additional information on PG.

A4.5.7. Column 7: Special Provisions. Column 7 specifies codes for special provisions that are applicable for each PSN, hazard class, and PG. Special provision codes may vary, depending on the PG. Requirements of the special provision codes are identified in **Table A4.2**. The codes reflect four categories: numeric codes, codes beginning with "A", codes beginning with "N", and codes beginning with a “P”.

A4.5.7.1. Use codes beginning with a “P” to determine passenger eligibility for transport with hazardous materials.

A4.5.7.2. Use all other codes to determine packaging provisions, restrictions, and exceptions from requirements for particular quantities or forms of materials.

A4.5.7.3. When an additional packaging requirement is prescribed, the requirement is mandatory.

A4.5.8. Column 8: Packaging Paragraph. This column lists the applicable packaging paragraph. “FORBIDDEN” items are also identified in this column. Do not transport "FORBIDDEN" items by military aircraft.

A4.5.8.1. Except when otherwise identified, prepare hazardous material shipments according to the specified packaging paragraph.

A4.5.8.2. Packaging paragraphs in each attachment provide titles as a guide for PSNs covered by that paragraph. These titles are a guide only and are not all-inclusive.

A4.5.8.3. If a packaging paragraph in **Table A4.1** specifies packaging that is not applicable to the form of the material (i.e., the packaging specified is for a solid material and the material shipped is in liquid form) use the following guidance to select the appropriate paragraph:

A4.5.8.3.1. Use either packaging **paragraph A8.2** (liquids) or **A8.3** (solids) as appropriate.

A4.5.8.3.2. Use either packaging **paragraph A9.5** (liquids) or **A9.6** (solids) as appropriate.

A4.5.8.3.3. Use either packaging **paragraph A10.4** (liquids) or **A10.5** (solids as appropriate).

A4.5.8.3.4. Use either packaging **paragraph A12.2** (liquids) or **A12.3** (solids) as appropriate).

Table A4.1. Alphabetical Listing of Items.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Accellerene, see p-NITROSODIMETHYLANILINE					
		Accumulators, electric, see BATTERIES, WET, FILLED WITH ACID, BATTERIES, WET, FILLED WITH ALKALI, BATTERIES, WET, NON-SPILLABLE					
		Accumulators, pressurized, hydraulic (containing nonflammable gas), see ARTICLES, PRESSURIZED, HYDRAULIC					
		Accumulators, pressurized, pneumatic, see ARTICLES, PRESSURIZED, PNEUMATIC					
	UN1088	ACETAL	3		II	P5	A7.2.
	UN1089	ACETALDEHYDE	3		I	P3, A3	A7.2.
	UN1841	ACETALDEHYDE AMMONIA	9		III	P5	A13.14.
	UN2332	ACETALDEHYDE OXIME	3		III	P5	A7.2.
	UN2789	ACETIC ACID, GLACIAL *or* ACETIC ACID SOLUTION, *with more than 80% acid, by mass*	8	3	II	P5, A3, A6, A7, A10	A12.2.
	UN2790	ACETIC ACID SOLUTION, *with not less than 50%, but not more than 80% acid, by mass*	8		II	P5, A3, A6, A7, A10	A12.2.
	UN2790	ACETIC ACID SOLUTION, *with more than10%, but less than 50% acid, by mass*	8		III	P5	A12.2.
	UN1715	ACETIC ANHYDRIDE	8	3	II	P5, A3, A6, A7, A10	A12.2.
		Acetic oxide, see ACETIC ANHYDRIDE					
		Acetoin, see ACETYL METHYL CARBINOL					
	UN1090	ACETONE	3		II	P5	A7.2.
	UN1541	ACETONE CYANOHYDRIN, STABILIZED	6.1		I	P2, 2, A3, N34	A10.6.
	UN1091	ACETONE OILS	3		II	P5	A7.2.
	UN1648	ACETONITRILE	3		II	P5	A7.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Acetyl acetone peroxide with more than 9% by mass active oxygen					FORBIDDEN
		Acetyl benzoyl peroxide, solid, or with more than 40% in solution					FORBIDDEN
	UN1716	ACETYL BROMIDE	8		II	P5	A12.2.
	UN1717	ACETYL CHLORIDE	3	8	II	P5, A3, A6, A7, N34	A7.2.
		Acetyl cyclohexanesulphonyl peroxide,with more than 82% wetted with less than 12% water					FORBIDDEN
		Acetylene dichloride, see 1,2-DICHLOROETHYLENE					
	UN1001	ACETYLENE, DISSOLVED	2.1			P4 , N86, N88	A6.9.
		Acetylene (liquefied)					FORBIDDEN
		Acetylene silver nitrate					FORBIDDEN
		Acetylene, solvent free					FORBIDDEN
		Acetylene tetrabromide, see TETRABROMOETHANE					
		Acetylene tetrachloride; *see* TETRACHLOROETHANE					
	UN1898	ACETYL IODIDE	8		II	P5	A12.2.
	UN2621	ACETYL METHYL CARBINOL	3		III	P5	A7.2.
		Acetyl oxide, see ACETIC ANHYDRIDE					
		Acetyl peroxide, solid or with more than 25% in solution					FORBIDDEN
		Acid butyl phosphate, see BUTYL ACID PHOSPHATE					
		Acid, liquid, N.O.S., see CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S., *or* CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.					
		Acid mixture, hydrofluoric and sulphuric, see HYDROFLUORIC AND SULPHURIC ACID MIXTURE					
		Acid mixture, nitrating acid, see NITRATING ACID MIXTURE					
		Acid mixture, spent, nitrating acid, see NITRATING ACID, MIXTURE SPENT					
		Acid, picric, see TRINITROPHENOL *or* PICRIC ACID					
		Acid potassium sulphate, see POTASSIUM HYDROGEN SULPHATE					
		Acid, sludge, see Sludge Acid					
		Acraldehyde, stabilized, see ACROLEIN, STABILIZED					
	UN2713	ACRIDINE	6.1		III	P5	A10.5.
	UN2607	ACROLEIN DIMER, STABILIZED	3		III	P5	A7.2.
		Acrolein dimer, unstabilized					FORBIDDEN
	UN1092	ACROLEIN, STABILIZED	6.1	3	I	P1, 1	A10.6.
		Acrolein, unstabilized					FORBIDDEN
	UN2074	ACRYLAMIDE, SOLID	6.1		III	P5	A10.5.
	UN3426	ACRYLAMIDE SOLUTION	6.1		III	P5	A10.4
	UN2218	ACRYLIC ACID, STABILIZED	8	3	II	P5	A12.2.
		Acrylic acid, unstabilized					FORBIDDEN
	UN1093	ACRYLONITRILE, STABILIZED	3	6.1	I	P3	A7.2.
		Acrylonitrile, unstabilized					FORBIDDEN
		Actinolite, see WHITE ASBESTOS					
		Activated carbon or Activated charcoal, see CARBON, ACTIVATED					
		Actuating cartridge, explosive, see CARTRIDGES, POWER DEVICE, *etc.*					
	UN1133	ADHESIVES, *containing flammable liquid*	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2205	ADIPONITRILE	6.1		III	P5	A10.4.
	UN1950	AEROSOLS *or* AEROSOLS, FLAMMABLE	2.1			P5	A6.2.
		AEROSOLS, *flammable, containing substances in Class 8, Packing Group I*					FORBIDDEN
	UN1950	AEROSOLS, *flammable, containing substances in Class 8, Packing Group II*	2.1	8			FORBIDDEN
	UN1950	AEROSOLS, *flammable, containing substances in Class 8, Packing Group III*	2.1	8		P5	A6.2
	UN1950	AEROSOLS, *flammable, containing substances in Division 6.1, Packing Group I*					FORBIDDEN
	UN1950	AEROSOLS, *flammable containing substances in Division 6.1, Packing Group II*					FORBIDDEN
	UN1950	AEROSOLS, *flammable containing substances in Division 6.1, Packing Group III*	2.1	6.1		P5	A6.2
	UN1950	AEROSOLS, *flammable, containing substances in Division 6.1, Packing Group III and substances in Class 8, Packing Group III*	2.1	6.1, 8		P5	A6.2.
	UN1950	AEROSOLS, *flammable, containing toxic gas*	2.3	2.1			FORBIDDEN
	UN1950	AEROSOLS, FLAMMABLE (ENGINE STARTING FLUID) *or* AEROSOLS, FLAMMABLE, N.O.S. *(engine starting fluid)*	2.1			P5	A6.2
	UN1950	AEROSOLS *or* AEROSOLS, NON-FLAMMABLE	2.2			P5	A6.2.
	UN1950	AEROSOLS, NON-FLAMMABLE *(containing biological products or a medicinal preparation which will be deteriorated by a heat test)*	2.2			P5	A6.2.
	UN1950	AEROSOLS, *non-flammable, (tear gas devices)*	2.2	6.1		P5	A6.2.
	UN1950	AEROSOLS, *non-flammable, containing substances in Class 8, Packing Group I*	2.2	8			FORBIDDEN
	UN1950	AEROSOLS, *non-flammable, containing substances in Class 8, Packing Group II*	2.2	8			FORBIDDEN
	UN1950	AEROSOLS, *non-flammable, containing substances in Class 8, Packing Group III*	2.2	8		P5	A6.2
	UN1950	AEROSOLS, *non-flammable, containing substances in Division 6.1, Packing Group I or II*					FORBIDDEN
	UN1950	AEROSOLS, *non-flammable, containing substances in Division 6.1, Packing Group III*	2.2	6.1		P5	A6.2
	UN1950	AEROSOLS, *non-flammable, containing substances in Division 6.1, Packing Group III and substances in Class 8, Packing Group III*	2.2	6.1, 8		P5	A6.2.
	UN1950	AEROSOLS, *non-flammable, containing toxic gas*	2.3				FORBIDDEN
	UN1950	AEROSOLS, *non-flammable, oxidizing*	2.2	5.1		P5	A6.2
	UN0331	AGENT, BLASTING TYPE B	1.5D		II	P4, 105, 106, A69	A5.11.
	UN0332	AGENT, BLASTING TYPE E	1.5D		II	P4, 105, 106, A69	A5.11.
	UN0503	AIR BAG INFLATORS *or* AIR BAG MODULES *or* SEAT-BELT PRETENSIONERS	1.4G		II	P5	A5.18.
	UN3268	AIR BAG INFLATORS *or* AIR BAG MODULES *or* SEAT-BELT PRETENSIONERS	9		III	P5	A13.15.
	UN1002	AIR, COMPRESSED	2.2			P5, A124	A6.3., A6.5.
	UN1003	AIR, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2	5.1		P4	A6.11.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1003	AIR, REFRIGERATED LIQUID *(cryogenic liquid)* non-*pressurized*	2.2	5.1		P4	A6.11.
		Aircraft, see VEHICLE, FLAMMABLE GAS POWERED *or* VEHICLE FLAMMABLE LIQUID POWERED					
		Aircraft Engines (including turbines), see ENGINES, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED, *or* ENGINES INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED					
		Aircraft evacuation slides or Aircraft survival kits, see LIFE-SAVING APPLIANCES, SELF-INFLATING *or* LIFE-SAVING APPLIANCES, NOT SELF-INFLATING					
	UN3165	AIRCRAFT HYDRAULIC POWER UNIT FUEL TANK *(containing a mixture of anhydrous hydrazine and monomethyl hydrazine) (M86 fuel)*	3	6.1, 8	I	P3, A501	A7.4.
★	UN3274	ALCOHOLATES SOLUTION, N.O.S. *in alcohol*	3	8	II	P5	A7.2.
		Alcohol, denatured, see ALCOHOLS, FLAMMABLE TOXIC *or* ALCOHOLS, N.O.S.					
	UN3065	ALCOHOLIC BEVERAGES	3		II III	P5 P5	A7.2. A7.2.
		Alcohol, industrial, see ALCOHOLS, FLAMMABLE, TOXIC, N.O.S. *or* ALCOHOLS, N.O.S.					
★	UN1987	ALCOHOLS, N.O.S.	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
★	UN1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	6.1 6.1 6.1	I II III	P3 P4 P5	A7.2. A7.2. A7.2.
		Aldehyde, see ACETALDEHYDE					
		Aldehyde ammonia, see ACETALDEHYDE AMMONIA					
★	UN1989	ALDEHYDES, N.O.S.	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
★	UN1988	ALDEHYDES, FLAMMABLE, TOXIC, N.O.S	3	6.1 6.1 6.1	I II III	P3 P4 P5	A7.2. A7.2. A7.2.
	UN2839	ALDOL	6.1		II	P5	A10.4.
★	UN3206	ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S.	4.2	8 8	II III	P4 P5	A8.3. A8.3.
	UN1421	ALKALI METAL ALLOYS, LIQUID, N.O.S	4.3		I	P3, A2, A3, A7, N34	A8.2.
	UN1389	ALKALI METAL AMALGAMS, LIQUID	4.3		I	P3, A2, A3, A7, N34	A8.2.
	UN3401	ALKALI METAL AMALGAMS, SOLID	4.3		I	P3, N40	A8.3.
	UN1390	ALKALI METAL AMIDES	4.3		II	P5, A6, A7, A8, A19, A20	A8.3.
	UN1391	ALKALI METAL DISPERSIONS *or* ALKALINE EARTH METAL DISPERSIONS	4.3		I	P3, A2, A3, A7	A8.2.
	UN3482	ALKALI METAL DISPERSIONS, FLAMMABLE *or* ALKALINE EARTH METAL DISPERSIONS, FLAMMABLE	4.3	3	I	P3, A2, A3, A7	A8.2.
		Alkaline corrosive battery fluid, see BATTERY FLUID, ALKALI					
		Alkaline corrosive liquids, N.O.S., see CAUSTIC ALKALI LIQUIDS, N.O.S.					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Alkaline corrosive solid n.o.s., see CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. *or* CORROSIVE SOLID, BASIC ORGANIC, N.O.S.					
★	UN3205	ALKALINE EARTH METAL ALCOHOLATES, N.O.S	4.2		II III	P4, A7 P5, A7	A8.3. A8.3.
	UN1393	ALKALINE EARTH METAL ALLOYS, N.O.S.	4.3		II	P5, A19	A8.3.
	UN1392	ALKALINE EARTH METAL AMALGAMS LIQUID	4.3		I	P3, A19, N34, N40	A8.2.
	UN3402	ALKALINE EARTH METAL AMALGAM SOLID	4.3		I	P3, A19, N34, N40	A8.3
★	UN3140	ALKALOIDS, LIQUID, N.O.S. *or* ALKALOID SALTS, LIQUID, N.O.S.	6.1		I II III	P3, A4 P5 P5	A10.4. A10.4. A10.4.
★	UN1544	ALKALOIDS, SOLID, N.O.S. *or* ALKALOID SALTS, SOLID, N.O.S., *poisonous*	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN3145	ALKYLPHENOLS, LIQUID, N.O.S. *(including C2-C12 homologues)*	8		I II III	P3, A6 P5 P5	A12.2. A12.2. A12.2.
	UN2430	ALKYLPHENOLS, SOLID, N.O.S. *(including C2-C12 homologues)*	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
	UN2584	ALKYLSULFONIC ACIDS, LIQUID *or* ARYLSULFONIC ACIDS, LIQUID *with more than 5% free sulphuric acid*	8		II	P5	A12.2.
	UN2586	ALKYLSULFONIC ACIDS, LIQUID *or* ARYLSULFONIC ACIDS, LIQUID *with not more than 5% free sulfuric acid*	8		III	P5	A12.2.
	UN2583	ALKYLSULFONIC ACIDS, SOLID, *or* ARYLSULFONIC ACIDS, SOLID, *with more than 5% free sulfuric acid*	8		II	P5	A12.3.
	UN2585	ALKYLSULFONIC ACIDS, SOLID, *or* ARYLSULFONIC ACIDS, SOLID, *with not more than 5% free sulfuric acid*	8		III	P5	A12.3.
★	UN2571	ALKYLSULFURIC ACIDS	8		II	P4	A12.2.
		Allene, see PROPADIENE, STABILIZED					
		Allethrin, see PESTICIDES, LIQUID, TOXIC, N.O.S.					
	UN2333	ALLYL ACETATE	3	6.1	II	P4	A7.2.
	UN1098	ALLYL ALCOHOL	6.1	3	I	P2, 2	A10.6.
	UN2334	ALLYLAMINE	6.1	3	I	P2, 2	A10.6.
	UN1099	ALLYL BROMIDE	3	6.1	I	P3	A7.2.
	UN1100	ALLYL CHLORIDE	3	6.1	I	P3	A7.2.
		Allyl chlorocarbonate, see ALLYL CHLOROFORMATE					
	UN1722	ALLYL CHLOROFORMATE	6.1	3, 8	I	P2, 2, A3, N41	A10.6.
	UN2335	ALLYL ETHYL ETHER	3	6.1	II	P4	A7.2.
	UN2336	ALLYL FORMATE	3	6.1	I	P3	A7.2.
	UN2219	ALLYL GLYCIDYL ETHER	3		III	P5	A7.2.
	UN1723	ALLYL IODIDE	3	8	II	P5,A3,A6,N34	A7.2.
	UN1545	ALLYL ISOTHIOCYANATE, STABILIZED	6.1	3	II	P4, A3, A7	A10.4.
		Allyl Isothiocyanate, unstabilized					FORBIDDEN
	UN1724	ALLYLTRICHLOROSILANE, STABILIZED	8	3	II	P5, A7, N34	A12.2.
		Allyltrichlorosilane, unstabilized					FORBIDDEN
	UN2870	ALUMINIUM BOROHYDRIDE *or* ALUMINIUM BOROHYDRIDE IN DEVICES	4.2	4.3	I	P3	A8.5.
	UN1725	ALUMINIUM BROMIDE, ANHYDROUS	8		II	P5	A12.3.
	UN2580	ALUMINIUM BROMIDE, SOLUTION	8		III	P5	A12.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1394	ALUMINIUM CARBIDE	4.3		II	P4, A20, N41	A8.3.
	UN1726	ALUMINIUM CHLORIDE, ANHYDROUS	8		II	P5	A12.3.
	UN2581	ALUMINIUM CHLORIDE, SOLUTION	8		III	P5	A12.2.
		Aluminum dross, see ALUMINUM SMELTING BY-PRODUCTS *or* ALUMINUM REMELTING BY-PRODUCTS					
		Aluminum dross, wet or hot					FORBIDDEN
	UN1395	ALUMINIUM FERROSILICON POWDER	4.3	6.1 6.1	II III	P4, A19 P5, A19, A20	A8.3. A8.3.
	UN2463	ALUMINIUM HYDRIDE	4.3		I	P3, A19, N40	A8.3.
		Aluminum liquid or aluminum paint, see PAINT					
D	NA9260	ALUMINUM, MOLTEN	9				FORBIDDEN
	UN1438	ALUMINIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
		Aluminium phosphate solution, see CORROSIVE LIQUIDS, N.O.S.					
	UN1397	ALUMINIUM PHOSPHIDE	4.3	6.1	I	P3,A8,A19, N40	A8.3.
	UN3048	ALUMINIUM PHOSPHIDE PESTICIDES	6.1		I	P5, A8	A10.5.
	UN1309	ALUMINIUM POWDER, COATED	4.1		II III	P5 P5	A8.3. A8.3.
	UN1396	ALUMINIUM POWDER, UNCOATED	4.3		II III	P4, A19, A20 P5, A19, A20	A8.3. A8.3.
	UN2715	ALUMINIUM RESINATE	4.1		III	P5	A8.3.
	UN1398	ALUMINIUM SILICON POWDER, UNCOATED	4.3		III	P5, A1, A19	A8.3.
	UN3170	ALUMINIUM SMELTING BY-PRODUCTS *or* ALUMINIUM REMELTING BY-PRODUCTS	4.3		II III	P4 P5	A8.3. A8.3.
		Amatols, see EXPLOSIVE, BLASTING, TYPE B					
★	UN2733	AMINES, FLAMMABLE, CORROSIVE N.O.S. *or* POLYAMINES, FLAMMABLE, CORROSIVE N.O.S.	3	8 8 8	I II III	P3 P4 P4	A7.2. A7.2. A7.2.
★	UN2734	AMINES, LIQUID, CORROSIVE, FLAMMABLE N.O.S. *or* POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.	8	3 3	I II	P3, A3, A6, N34 P4	A12.2. A12.2.
★	UN2735	AMINES, LIQUID, CORROSIVE, N.O.S. *or* POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8		I II III	P3, A3, A6, N34 P4 P5	A12.2. A12.2. A12.2.
★	UN3259	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
	UN2673	2-AMINO-4-CHLOROPHENOL	6.1		II	P5	A10.5.
	UN3317	2-AMINO-4, 6-DINITROPHENOL, WETTED *with not less than 20% water by mass*	4.1		I	P5, 23, A8, A19, A20, N41	A8.3.
	UN2946	2-AMINO-5-DIETHYLAMINOPENTANE	6.1		III	P5	A10.4.
	UN3055	2-(2-AMINOETHOXY) ETHANOL	8		III	P5	A12.2.
	UN2815	N-AMINOETHYLPIPERAZINE	8		III	P5	A12.2.
		1-Amino-2-nitrobenzene or 1-Amino-3-nitrobenzene or 1-Amino-4-nitrobenzene, see NITROANILINES					
	UN2512	AMINOPHENOLS *(o-; m-; p-)*	6.1		III	P5	A10.5.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Aminopropyldiethanolamine or n-Aminopropylmorpholine, see AMINES, LIQUID, CORROSIVE, N.O.S., *etc.*					
	UN2671	AMINOPYRIDINES *(o-; m-; p)*	6.1		II	P5	A10.5.
D	UN1005	AMMONIA, ANHYDROUS	2.2			P2, 13	A6.4.
	UN1005	AMMONIA, ANHYDROUS	2.3	8		P2, 4, 13, N87	A6.4.
D	UN3318	AMMONIA SOLUTIONS, *relative density less than 0.880 at 15 degrees C in water, with more than 50% ammonia*	2.2			P2, 13	A6.4.
	UN3318	AMMONIA SOLUTIONS, *relative density less than 0.880 at 15 degrees C in water, with more than 50% ammonia*	2.3	8		P2, 4 , N87	A6.4.
	UN2672	AMMONIA SOLUTIONS, *relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10%, but not more than 35% ammonia*	8		III	P5	A12.2.
	UN2073	AMMONIA SOLUTIONS, *relative density less than 0.880 at 15 degrees C in water, with more than 35%, but not more than 50% ammonia*	2.2			P5, N87	A6.3., A6.4.
	UN1546	AMMONIUM ARSENATE	6.1		II	P5	A10.5.
		Ammonium azide					FORBIDDEN
		Ammonium bichromate, see AMMONIUM DICHROMATE					
		Ammonium bifluoride, solid, see AMMONIUM HYDROGENDIFLUORIDE, SOLID					
		Ammonium bifluoride, solution, see AMMONIUM HYDROGENDIFLUORIDE, SOLUTION					
		Ammonium bisulphate, see AMMONIUM HYDROGEN SULPHATE					
		Ammonium bisulfite, see BISULFITES, AQUEOUS SOLUTION, N.O.S.					
		Ammonium bromate					FORBIDDEN
		Ammonium chlorate					FORBIDDEN
	UN1439	AMMONIUM DICHROMATE	5.1		II	P5	A9.6.
	UN1843	AMMONIUM DINITRO-O-CRESOLATE, SOLID	6.1		II	P5	A10.5.
	UN3424	AMMONIUM DINITRO-O-CRESOLATE, SOLUTION	6.1		II III	P5 P5	A10.4 A10.4
	UN2505	AMMONIUM FLUORIDE	6.1		III	P5	A10.5.
	UN2854	AMMONIUM FLUOROSILICATE	6.l		III	P5	A10.5.
		Ammonium fulminate					FORBIDDEN
		Ammonium hexafluorosilicate, see AMMONIUM FLUOROSILICATE					
		Ammonium hydrate, see AMMONIA SOLUTIONS, *etc.*					
	UN2506	AMMONIUM HYDROGEN SULPHATE	8		II	P5	A12.3.
	UN1727	AMMONIUM HYDROGENDIFLUORIDE, SOLID	8		II	P5, N34	A12.3.
	UN2817	AMMONIUM HYDROGENDIFLUORIDE, SOLUTION	8	6.1 6.1	II III	P4, N34 P5, N3	A12.2. A12.2.
		Ammonium hydrosulphide solution, see AMMONIUM SULPHIDE SOLUTION					
		Ammonium hydroxide, see AMMONIA SOLUTION, *etc.*					
		Ammonium hydroxide, see AMMONIA SOLUTION, *etc.*					
	UN2859	AMMONIUM METAVANADATE	6.1		II	P5	A10.5.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN0222	AMMONIUM NITRATE, *with more than 0.2% combustible substances, including any organic substance calculated as carbon to the exclusion of any other added substance*	1.1D		II	P4, A69	A5.7.
	UN1942	AMMONIUM NITRATE, *with not more than 0.2% total combustible material, including any organic substance calculated as carbon, to the exclusion of any other added substance*	5.1		III	P5, A1, A29	A9.6.
	UN2067	AMMONIUM NITRATE BASED FERTILIZERS	5.1		III	P5,	A9.6.
	UN3375	AMMONIUM NITRATE EMULSION, *or* AMMONIUM NITRATE SUSPENSION, *or* AMMONIUM NITRATE GEL, *intermediate for blasting explosives*	5.1		II		FORBIDDEN
		Ammonium nitrate explosives, see EXPLOSIVE, BLASTING, TYPE B					
	UN2071	AMMONIUM NITRATE FERTILIZER	9		III	P5	A13.2.
D	NA0331	AMMONIUM NITRATE-FUEL OIL MIXTURE *(containing only prilled Ammonium Nitrate and fuel oil)*	1.5D		II	P4	A5.11.
	UN2426	AMMONIUM NITRATE LIQUID, *hot concentrated solution*	5.1				FORBIDDEN
		Ammonium nitrite					FORBIDDEN
	UN0402	AMMONIUM PERCHLORATE	1.1D		II	P4, 107	A5.7.
	UN1442	AMMONIUM PERCHLORATE	5.1		II	P5, 107, A9	A9.6.
		Ammonium Permanganate					FORBIDDEN
	UN1444	AMMONIUM PERSULPHATE	5.1		III	P5, A1, A29	A9.6.
	UN0004	AMMONIUM PICRATE, *dry or wetted with less than 10% water, by mass*	1.1D		II	P4	A5.6.
	UN1310	AMMONIUM PICRATE, WETTED *with not less than 10% water, by mass*	4.1		I	P4, 23, A2, N41	A8.3.
	UN2818	AMMONIUM POLYSULPHIDE, SOLUTION	8	6.1 6.1	II III	P4 P5	A12.2. A12.2.
	UN2861	AMMONIUM POLYVANADATE	6.1		II	P5	A10.5.
		Ammonium silicofluoride, see AMMONIUM FLUOROSILICATE					
	UN2683	AMMONIUM SULPHIDE SOLUTION	8	6.1, 3	II	P4	A12.2.
		Ammonium tetrachloromercurate, see MERCURY AMMONIUM CHLORIDE					
		Ammunition, blank, see CARTRIDGES FOR WEAPONS, BLANK					
		Ammunition, fixed, semi-fixed or separate loading; see CARTRIDGES FOR WEAPONS, *etc.*					
	UN0171	AMMUNITION, ILLUMINATING, *with or without burster, expelling charge or propelling charge*	1.2G		II	P4	A5.12.
	UN0254	AMMUNITION, ILLUMINATING, *with or without burster, expelling charge or propelling charge*	1.3G		II	P4	A5.12.
	UN0297	AMMUNITION, ILLUMINATING, *with or without burster, expelling charge or propelling charge*	1.4G		II	P5	A5.12.
	UN0247	AMMUNITION, INCENDIARY *liquid or gel, with burster, expelling charge or propelling charge*	1.3J		II	P3	A5.12.
		Ammunition, incendiary (water-activated contrivances) with burster, expelling charge or propelling charge; see CONTRIVANCES, WATER-ACTIVATED, *etc.*					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN0243	AMMUNITION, INCENDIARY, WHITE PHOSPHOROUS, *with burster expelling charge or propelling charge*	1.2H		II	P3	A5.12.
	UN0244	AMMUNITION, INCENDIARY, WHITE PHOSPHOROUS, *with burster expelling charge or propelling charge*	1.3H		II	P3	A5.12.
	UN0009	AMMUNITION, INCENDIARY, *with or without burster, expelling charge, or propelling charge*	1.2G		II	P4	A5.12.
	UN0010	AMMUNITION, INCENDIARY, *with or without burster, expelling charge, or propelling charge*	1.3G		II	P4	A5.12.
	UN0300	AMMUNITION, INCENDIARY, *with or without burster, expelling charge, or propelling charge*	1.4G		II	P5	A5.12.
		Ammunition, industrial, see CARTRIDGES, POWER DEVICE *or* CARTRIDGES, OIL WELL					
		Ammunition, lachrymatory, see AMMUNITION, TEAR-PRODUCING					
	UN0362	AMMUNITION, PRACTICE	1.4G		II	P5	A5.12.
	UN0488	AMMUNITION, PRACTICE	1.3G		II	P4	A5.12.
	UN0363	AMMUNITION, PROOF	1.4G		II	P5	A5.12.
		Ammunition, rocket, see WARHEADS, ROCKET					
		Ammunition, SA (small arms), see CARTRIDGES FOR WEAPONS INERT PROJECTILE, *etc.*					
		Ammunition, smoke (water-activated contrivances), white phosphorus, with burster, expelling charge or propelling charge; see CONTRIVANCES, WATER-ACTIVATED, *etc.* (UN0248)					
		Ammunition, smoke (water-activated contrivances), without white phosphorus or phosphides, with burster, expelling charge or propelling charge; see CONTRIVANCES, WATER-ACTIVATED, *etc.* (UN0249)					
	UN0015	AMMUNITION, SMOKE, *with or without burster, expelling charge or propelling charge*	1.2G		II	P4	A5.12.
	UN0016	AMMUNITION, SMOKE, *with or without burster, expelling charge or propelling charge*	1.3G		II	P4	A5.12.
	UN0303	AMMUNITION, SMOKE, *with or without burster, expelling charge or propelling charge*	1.4G		II	P5	A5.12.
	UN0245	AMMUNITION, SMOKE, WHITE PHOSPHORUS, *with burster, expelling charge, or propelling charge*	1.2H		II	P3	A5.12.
	UN0246	AMMUNITION, SMOKE, WHITE PHOSPHORUS, *with burster, expelling charge, or propelling charge*	1.3H		II	P3	A5.12.
		Ammunition, sporting, see CARTRIDGES FOR WEAPONS, *etc. (UN0012,UN0328, UN0339)*					
	UN2017	AMMUNITION, TEAR-PRODUCING, NONEXPLOSIVE, *without burster or expelling charge, nonfuzed*	6.1	8	II	P4	A10.5.
	UN0018	AMMUNITION, TEAR-PRODUCING, *with burster expelling charge or propelling charge*	1.2G	8, 6.1	II	P4	A5.12.
	UN0019	AMMUNITION, TEAR-PRODUCING, *with burster expelling charge or propelling charge*	1.3G	8, 6.1	II	P4	A5.12.
	UN0301	AMMUNITION, TEAR-PRODUCING, *with burster expelling charge or propelling charge*	1.4G	8, 6.1	II	P5	A5.12.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN0020	AMMUNITION, TOXIC, *with burster, expelling charge, or propelling charge*	1.2K	6.1	II	P1	A5.3.
★	UN0021	AMMUNITION, TOXIC, *with burster, expelling charge, or propelling charge*	1.3K	6.1	II	P1	A5.3.
		Ammunition, toxic (water-activated contrivances), with burster, expelling charge or propelling charge; see CONTRIVANCES, WATER-ACTIVATED, *etc.*					
	UN2016	AMMUNITION, TOXIC, NON-EXPLOSIVE, *without burster or expelling charge, nonfuzed*	6.1		II	P2	A10.5.
		Amorces, see FIREWORKS					
		Amosite, see BROWN ASBESTOS					
	UN1104	AMYL ACETATES	3		III	P5	A7.2.
	UN2819	AMYL ACID PHOSPHATE	8		III	P5	A12.2.
		Amyl alcohols, see PENTANOLS					
		Amyl aldehyde, see VALERALDEHYDE					
	UN1106	AMYLAMINES	3	8 8	II III	P5 P5	A7.2. A7.2.
	UN2620	AMYL BUTYRATES	3		III	P5	A7.2.
	UN1107	AMYL CHLORIDES	3		II	P5	A7.2.
	UN1108	n-AMYLENE	3		I	P3	A7.2.
	UN1109	AMYL FORMATES	3		III	P5	A7.2.
	UN1111	AMYL MERCAPTANS	3		II	P5, A3, A6	A7.2.
	UN1110	n-AMYL METHYL KETONE	3		III	P5	A7.2.
	UN1112	AMYL NITRATE	3		III	P5	A7.2.
	UN1113	AMYL NITRITES	3		II	P5	A7.2.
		tert-Amylperoxy-3,5,5-trimethylhexanoate					FORBIDDEN
	UN1728	AMYLTRICHLOROSILANE	8		II	P5, A7, N34	A12.2.
		Anaesthetic ether, see DIETHYL ETHER					
		Anhydrous ammonia, see AMMONIA, ANHYDROUS					
		Anhydrous hydrazine, see HYDRAZINE, ANHYDROUS					
		Anhydrous hydriodic acid, see HYDROGEN IODIDE, ANHYDROUS					
		Anhydrous hydrofluoric acid, see HYDROGEN FLUORIDE, ANHYDROUS					
+	UN1547	ANILINE	6.1		II	P5	A10.4.
		Aniline chloride, see ANILINE HYDROCHLORIDE					
	UN1548	ANILINE HYDROCHLORIDE	6.1		III	P5	A10.5.
		Aniline oil, see ANILINE					
		Aniline salt, see ANILINE HYDROCHLORIDE					
	UN2431	ANISIDINES	6.1		III	P5	A10.4.
	UN2222	ANISOLE	3		III	P5	A7.2.
	UN1729	ANISOYL CHLORIDE	8		II	P5	A12.2.
		Anthophyllite, see WHITE ASBESTOS					
		Anti-freeze liquid, see FLAMMABLE LIQUIDS, N.O.S.					
		Anti-knock compound, mixture, see MOTOR FUEL ANTI-KNOCK MIXTURES					
		Antimonious chloride, see ANTIMONY TRICHLORIDE					
★	UN3141	ANTIMONY COMPOUNDS, INORGANIC, LIQUID, N.O.S.	6.1		III	P5	A10.4.
★	UN1549	ANTIMONY COMPOUNDS, INORGANIC, SOLID, N.O.S.	6.1		III	P5	A10.5.
		Antimony hydride, see STIBINE					
		Antimony (III) lactate, see ANTIMONY LACTATE					
	UN1550	ANTIMONY LACTATE	6.1		III	P5	A10.5.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Antimony oxide, see ANTIMONY COMPOUND, INORGANIC, SOLID, N.O.S.					
	UN1730	ANTIMONY PENTACHLORIDE, LIQUID	8		II	P5	A12.2.
	UN1731	ANTIMONY PENTACHLORIDE, SOLUTIONS	8		II III	P5 P5	A12.2. A12.2.
	UN1732	ANTIMONY PENTAFLUORIDE	8	6.1	II	P4, A3, A6, A7, A10, N3, N36	A12.2.
		Antimony pentasulphide, see ANTIMONY COMPOUND, INORGANIC, SOLID, N.O.S.					
		Antimony perchloride, liquid, see ANTIMONY PENTACHLORIDE, LIQUID					
	UN1551	ANTIMONY POTASSIUM TARTRATE	6.1		III	P5	A10.5.
	UN2871	ANTIMONY POWDER	6.1		III	P5	A10.5.
		Antimony sulphide and chlorate, mixture of					FORBIDDEN
		Antimony sulphide, solid, see ANTIMONY COMPOUNDS, INORGANIC, N.O.S.					
	UN1733	ANTIMONY TRICHLORIDE, LIQUID	8		II	P5	A12.2.
	UN1733	ANTIMONY TRICHLORIDE, SOLID	8		II	P5	A12.3.
		Antu, see NAPTHYLTHIOUREA					
		Aqua ammonia, see AMMONIA SOLUTION					
	UN1006	ARGON, COMPRESSED	2.2			P5	A6.3., A6.5.
	UN1951	ARGON, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2		I	P4	A6.11.
		Aromatic liquids, see EXTRACTS, AROMATIC, LIQUID *or* EXTRACTS, FLAVOURING, LIQUID					
		Arsenate of lead, see LEAD ARSENATES					
		Arsenates n.o.s., see ARSENIC COMPOUND, LIQUID, N.O.S. *or* ARSENIC COMPOUND, SOLID					
	UN1558	ARSENIC	6.1		II	P5	A10.5.
	UN1553	ARSENIC ACID, LIQUID	6.1		I	P3	A10.4.
	UN1554	ARSENIC ACID, SOLID	6.1		II	P5	A10.5.
	UN1562	ARSENICAL DUST	6.1		II	P5	A10.5.
★	UN2760	ARSENICAL PESTICIDES, LIQUID, FLAMMABLE, TOXIC, *flashpoint less than 23 degrees* C	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN2994	ARSENICAL PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P5 P5	A10.4. A10.4. A10.4.
★	UN2993	ARSENICAL PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., *flashpoint not less than 23 degrees C*	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2759	ARSENICAL PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Arsenious acid, solid, see ARSENIC TRIOXIDE					
		Arsenious and mercuric iodide solution, see ARSENIC COMPOUNDS, LIQUID, N.O.S.					
	UN1555	ARSENIC BROMIDE	6.1		II	P5	A10.5.
		Arsenic (III) bromide, see ARSENIC BROMIDE					
		Arsenic chloride, see ARSENIC TRICHLORIDE					
★	UN1556	ARSENIC COMPOUNDS, LIQUID, N.O.S. *inorganic, including Arsenates, N.O.S., Arsenites, N.O.S., Arsenic sulphides,* N.O.S., *and Organic compounds of arsenic, N.O.S.*	6.1		I II III	P3 P5 P5	A10.4. A10.4. A10.4.
★	UN1557	ARSENIC COMPOUNDS, SOLID, N.O.S., *including Arsenates, N.O.S., Arsenites, N.O.S., Arsenic sulphides, N.O.S., and Organic compounds of arsenic, N.O.S.*	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Arsenic, fuming liquid, see ARSENIC TRICHLORIDE					
		Arsenic hydride, see ARSINE					
		Arsenic (III) oxide, ARSENIC TRIOXIDE					
		Arsenic (V) oxide, see ARSENIC PENTOXIDE					
	UN1559	ARSENIC PENTOXIDE	6.1		II	P5	A10.5.
		Arsenic sulphide and a chlorate, mixtures of					FORBIDDEN
		Arsenic sulphides, n.o.s., see, ARSENIC COMPOUND, LIQUID, N.O.S. *or* ARSENIC COMPOUND SOLID N.O.S.					
	UN1560	ARSENIC TRICHLORIDE	6.1		I	P2, 2	A10.6.
	UN1561	ARSENIC TRIOXIDE	6.1		II	P5	A10.5.
		Arsenic, white, solid, see ARSENIC TRIOXIDE					
		Arsenious chloride, see ARSENIC TRICHLORIDE					
		Arsenites, n.o.s., see ARSENIC COMPOUND LIQUID, N.O.S. *or* ARSENIC COMPOUND, SOLID, N.O.S.					
		Arsenous and mercuric iodide solution, see ARSENIC COMPOUND LIQUID, N.O.S.					
		Arsenous chloride, see ARSENIC TRICHLORIDE					
	UN2188	ARSINE	2.3	2.1		P1, 1	A6.15.
★	UN0486	ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE *or* ARTICLES, EEI	1.6N		II	P5	A5.3.
★	UN0349	ARTICLES, EXPLOSIVE, N.O.S	1.4S		II	P5, A69	A5.3.
★	UN0350	ARTICLES, EXPLOSIVE, N.O.S.	1.4B		II	P5	A5.3.
★	UN0351	ARTICLES, EXPLOSIVE, N.O.S.	1.4C		II	P5	A5.3.
★	UN0352	ARTICLES, EXPLOSIVE, N.O.S.	1.4D		II	P5	A5.3.
★	UN0353	ARTICLES, EXPLOSIVE, N.O.S.	1.4G		II	P5	A5.3.
★	UN0354	ARTICLES, EXPLOSIVE, N.O.S.	1.1L		II	P3	A5.3.
★	UN0355	ARTICLES, EXPLOSIVE, N.O.S.	1.2L		II	P3	A5.3.
★	UN0356	ARTICLES, EXPLOSIVE, N.O.S.	1.3L		II	P3	A5.3.
★	UN0462	ARTICLES, EXPLOSIVE, N.O.S.	1.1C		II	P4	A5.3.
★	UN0463	ARTICLES, EXPLOSIVE, N.O.S.	1.1D		II	P4	A5.3.
★	UN0464	ARTICLES, EXPLOSIVE, N.O.S.	1.1E		II	P4	A5.3.
★	UN0465	ARTICLES, EXPLOSIVE, N.O.S.	1.1F		II	P4	A5.3.
★	UN0466	ARTICLES, EXPLOSIVE, N.O.S.	1.2C		II	P4	A5.3.
★	UN0467	ARTICLES, EXPLOSIVE, N.O.S.	1.2D		II	P4	A5.3.
★	UN0468	ARTICLES, EXPLOSIVE, N.O.S.	1.2E		II	P4	A5.3.
★	UN0469	ARTICLES, EXPLOSIVE, N.O.S.	1.2F		II	P4	A5.3.
★	UN0470	ARTICLES, EXPLOSIVE, N.O.S.	1.3C		II	P4	A5.3.
★	UN0471	ARTICLES, EXPLOSIVE, N.O.S.	1.4E		II	P5	A5.3.
★	UN0472	ARTICLES, EXPLOSIVE, N.O.S.	1.4F		II	P5	A5.3.
	UN3164	ARTICLES, PRESSURIZED HYDRAULIC *containing nonflammable gas*	2.2			P5	A6.4., A6.5., A6.8.
	UN3164	ARTICLES, PRESSURIZED PNEUMATIC *containing nonflammable gas*	2.2			P5	A6.4., A6.5., A6.8.
	UN0380	ARTICLES, PYROPHORIC	1.2L		II	P3	A5.3.
	UN0428	ARTICLES, PYROTECHNIC *for technical purposes*	1.1G		II	P4	A5.18.
	UN0429	ARTICLES, PYROTECHNIC *for technical purposes*	1.2G		II	P4	A5.18.
	UN0430	ARTICLES, PYROTECHNIC *for technical purposes*	1.3G		II	P4	A5.18.
	UN0431	ARTICLES, PYROTECHNIC *for technical purposes*	1.4G		II	P5	A5.18.
	UN0432	ARTICLES, PYROTECHNIC *for technical purposes*	1.4S		II	P5, A69	A5.18.
	UN2586	ARYLSULPHONIC ACIDS. LIQUID, *with 5% or less free sulphuric acid*	8		III	P5	A12.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2584	ARYLSULPHONIC ACIDS. LIQUID, *with more than 5% free sulphuric acid*	8		II	P5	A12.2.
	UN2585	ARYLSULPHONIC ACIDS. SOLID, *with 5% or less free sulphuric acid*	8		III	P5	A12.3.
	UN2583	ARYLSULPHONIC ACIDS. SOLID, *with more than 5% free sulphuric acid*	8		II	P5	A12.3.
D	NA2212	ASBESTOS	9		III	P5	A13.15
		Asbestos, blue or brown or white, see BLUE ASBESTOS, WHITE ASBESTOS, *or* BROWN ASBESTOS, *etc.*					
		Ascaridole (organic peroxide)					FORBIDDEN
D	NA1999	ASPHALT, *at or above its flashpoint*	9		III		FORBIDDEN
		Asphalt, cut back; see TARS, LIQUID, *etc.*					
		Automobile, motorcycle, tractor, other self-propelled vehicle, engine, or other mechanical apparatus, see VEHICLES *or* BATTERY, *etc.*					
★	UN3334	AVIATION REGULATED LIQUID, N.O.S.	9			P5, A35, A506	A13.14.
★	UN3335	AVIATION REGULATED SOLID, N.O.S.	9			P5, A35, A506	A13.14.
		Azaurolic Acid (salt of) (dry)					FORBIDDEN
		Azidodithiocarbonic acid					FORBIDDEN
		Azidoethyl nitrate					FORBIDDEN
		Azido guanidine picrate (dry)					FORBIDDEN
		5-Azido-1-hydroxy tetrazole					FORBIDDEN
		Azido hydroxy tetrazole (mercury and silver salts)					FORBIDDEN
		3-Azido-1, 2-propylene glycol dinitrate					FORBIDDEN
		1-Aziridinylphosphine oxide-(tris), see TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE, SOLUTION					
	UN3242	AZODICARBONAMIDE	4.1				FORBIDDEN
		Azodicarbonamide formulation type b, temperature controlled					FORBIDDEN
		*2,2'-Azodi-(2,4-dimethyl-4-*methoxyvaleronitrile) *see* SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED					
		2,2'-Azodi-(2,4 *dimethylvaleronitrile) see* SELF-REACTIVE SOLID TYPE D TEMPERATURE CONTROLLED					
		1,1'-Azodi-(hexahydrobenzonitrile) see SELF-REACTIVE SOLID TYPE D					
		Azodiisobutyronitrile, see SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED					
		2,2'-Azodi-(2-methylbutyronitrile), see SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED					
		Azotetrazole (dry)					FORBIDDEN
		Bag charges, see CHARGES, PROPELLING, FOR CANNON, *etc.*					
		Ballistite, see POWDER, SMOKELESS, *etc.*					
		Bangalore torpedoes, see MINES, *etc.*					
	UN1400	BARIUM	4.3		II	P4, A19	A8.3.
		Barium alloys, see ALKALINE EARTH METAL ALLOY, N.O.S.					
	UN1854	BARIUM ALLOYS, PYROPHORIC	4.2		I	P3	A8.5.
	UN0224	BARIUM AZIDE, *dry or wetted with less than 50% water, by mass*	1.1A	6.1	II	P3, 111, 117	A5.4.
	UN1571	BARIUM AZIDE, *wetted with not less than 50% water, by mass*	4.1	6.1	I	P4, A2	A8.10.
	UN2719	BARIUM BROMATE	5.1	6.1	II	P4	A9.6.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1445	BARIUM CHLORATE, SOLID	5.1	6.1	II	P4, A9, N34	A9.6.
	UN3405	BARIUM CHLORATE SOLUTION	5.1	6.1 6.1	II III	P4, A9, N34 P4, A9, N34	A9.5. A9.5.
★	UN1564	BARIUM COMPOUNDS, N.O.S.	6.1		II III	P5 P5	A10.5. A10.5.
	UN1565	BARIUM CYANIDE	6.1		I	P5, N74, N75	A10.5.
		Barium binoxide, see BARIUM PEROXIDE					
	UN2741	BARIUM HYPOCHLORITE *with more than 22% available chlorine*	5.1	6.1	II	P5, A7, A9, N34	A9.6.
	UN1446	BARIUM NITRATE	5.1	6.1	II	P5	A9.6.
	UN1884	BARIUM OXIDE	6.1		III	P5	A10.5.
	UN1447	BARIUM PERCHLORATE, SOLID	5.1	6.1	II	P5	A9.6.
	UN3406	BARIUM PERCHLORATE, SOLUTION	5.1	6.1 6.1	II III	P5 P5	A9.5. A9.5.
	UN1448	BARIUM PERMANGANATE	5.1	6.1	II	P5	A9.6.
	UN1449	BARIUM PEROXIDE	5.1	6.1	II	P5, A9	A9.6.
		Barium selenate see SELENATES *or* SELENITES					
		Barium selenite, see SELENATES *or* SELENITES					
		Barium superoxide, see BARIUM PEROXIDE					
	UN3292	BATTERIES, CONTAINING SODIUM	4.3		II	P5	A8.18.
		Batteries, Dry , not regulated				A67	
	UN3028	BATTERIES, DRY, CONTAINING POTASSIUM HYDROXIDE SOLID, *electric storage*	8		III	P5	A12.3.
	UN2794	BATTERIES, WET, FILLED WITH ACID, *electric storage*	8		III	P5	A12.4.
	UN2795	BATTERIES, WET, FILLED WITH ALKALI, *electric storage*	8		III	P5	A12.4.
	UN2800	BATTERIES, WET, NON-SPILLABLE, *electric storage*	8		III	P5, A67	A12.4.
	UN2796	BATTERY FLUID, ACID	8		II	P5, A3, A7, N6, N34	A12.2., A12.4.
	UN2797	BATTERY FLUID, ALKALI	8		II	P5, N6	A12.2., A12.4.
	UN3171	BATTERY-POWERED EQUIPMENT	9			P5, 134	A13.6.
	UN3171	BATTERY-POWERED VEHICLE	9			P5, 134	A13.6.
		Battery, wet filled with acid or alkali with vehicle or mechanical equipment containing an internal combustion engine, see VEHICLE, *etc. or* ENGINES, INTERNAL COMBUSTION, *etc.*					
		Benzal chloride, see BENZYLIDENE CHLORIDE					
+	UN1990	BENZALDEHYDE	9		III	P5	A13.2.
	UN1114	BENZENE	3		II	P5	A7.2.
		Benzene diazonium chloride (dry)					FORBIDDEN
		Benzene diazonium nitrate (dry)					FORBIDDEN
		Benzene-1,3-disulpho hydrazide, not more than 52% as a paste see SELF- REACTIVE SOLID TYPE D					
		Benzene-1,3-disulphonyl hydrazide, more than 52% as a paste					FORBIDDEN
		Benzene phosphorus dichloride; see PHENYL PHOSPHORUS DICHLORIDE					
		Benzene phosphorus thiodichloride, see PHENYL PHOSPHORUS THIODICHLORIDE					
	UN2225	BENZENESULPHONYL CHLORIDE	8		III	P5	A12.2.
		Benzenesulphonyl hydrazide, see SELF-REACTIVE SOLID TYPE D					
		Benzenethiol, see PHENYL MERCAPTAN					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Benzene triozonide					FORBIDDEN
	UN1885	BENZIDINE	6.1		II	P5	A10.5.
		Benzol, see BENZENE					
		Benzolene, see PETROLEUM DISTILLATES, N.O.S.					
	UN2224	BENZONITRILE	6.1		II	P5	A10.4.
	UN2587	BENZOQUINONE	6.1		II	P5	A10.5.
		Benzosulphochloride, see BENZENESULPHONYL CHLORIDE					
	UN2226	BENZOTRICHLORIDE	8		II	P5	A12.2.
	UN2338	BENZOTRIFLUORIDE	3		II	P5	A7.2.
		Benzoxidiazoles (dry)					FORBIDDEN
		Benzoyl azide					FORBIDDEN
	UN1736	BENZOYL CHLORIDE	8		II	P5	A12.2.
	UN1737	BENZYL BROMIDE	6.1	8	II	P4, A3, A7, N33, N34	A10.4.
	UN1738	BENZYL CHLORIDE	6.1	8	II	P4, A3, A7, N33, N42	A10.4.
	UN1738	BENZYL CHLORIDE, *unstabilized*	6.1	8	II	P4, A3, A7, N33, N34, N43	A10.4.
		Benzyl chlorocarbonate, see BENZYL CHLOROFORMATE					
	UN1739	BENZYL CHLOROFORMATE	8		I	P3, A3, A6, N41	A12.2.
		Benzyl cyanide, see PHENYLACETONITRILE, LIQUID					
	UN2619	BENZYLDIMETHYLAMINE	8	3	II	P5	A12.2.
		4-(benzyl(ethyl)amino)-3-ethoxybenzenediazonium zinc chloride see SELF-REACTIVE SOLID TYPE D					
	UN1886	BENZYLIDENE CHLORIDE	6.1		II	P5	A10.4.
	UN2653	BENZYL IODIDE	6.1		II	P5	A10.4.
		4-(benzyl(methyl)amino)3-ethoxybenzenediazonium zinc chloride see SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED					
★	UN1566	BERYLLIUM COMPOUNDS, N.O.S.	6.1		II III	P5 P5	A10.5. A10.5.
	UN2464	BERYLLIUM NITRATE	5.1	6.1	II	P5	A9.6.
	UN1567	BERYLLIUM, POWDER	6.1	4.1	II	P5	A10.5.
		Beverage extract (concentrate), see CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.					
	UN2251	BICYCLO [2,2,1] HEPTA-2-5-DIENE, STABILIZED *or* 2,5-NORBORNADIENE, STABILIZED	3		II	P5	A7.3
	UN3373	BIOLOGICAL SUBSTANCE, CATEGORY B	6.2			P5, A508	A10.9
	UN3291	BIOMEDICAL WASTE, N.O.S.	6.2		II	P5, A117	A10.10.
		Biphenyl triozonide					FORBIDDEN
★	UN2782	BIPYRIDILIUM PESTICIDES, LIQUID, FLAMMABLE, TOXIC, *flashpoint less than 23 degrees C*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3016	BIPYRIDILIUM PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3015	BIPYRIDILIUM PESTICIDES, LIQUID, TOXIC, FLAMMABLE, *flashpoint not less than 23 degrees C*	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN2781	BIPYRIDILIUM PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN2837	BISULFATES, AQUEOUS SOLUTION	8		II III	P5, A7, N34 P5, A7, N34	A12.2. A12.2.
	UN2693	BISULFITES, AQUEOUS SOLUTIONS, N.O.S.	8		III	P5	A12.2.
	UN0027	BLACK POWDER *or* GUNPOWDER, *granular or as a meal*	1.1D		II	P4	A5.8.
	UN0028	BLACK, POWDER, COMPRESSED *or* GUNPOWDER, COMPRESSED *or* BLACK POWDER, IN PELLETS *or* GUNPOWDER, IN PELLETS	1.1D		II	P4	A5.8.
	NA0027	BLACK POWDER FOR SMALL ARMS	4.1		I		FORBIDDEN
		Blasting agent, n.o.s., see EXPLOSIVES, BLASTING					
		Blasting cap, assemblies; *see* DETONATOR ASSEMBLIES NON-ELECTRIC, *for blasting*					
		Blasting caps, electric, see DETONATORS, ELECTRIC, *for blasting*					
		Blasting caps, nonelectric, see DETONATORS, NON-ELECTRIC, *for blasting*					
		Bleach, bleach liquor or Bleach solutions, see HYPOCHLORITE SOLUTION					
		Bleaching powder, see CALCIUM HYPOCHLORITE MIXTURES, *etc*					
	UN2212	BLUE ASBESTOS *(crocidolite) or* BROWN ASBESTOS (*amosite, mysorite*)	9		II	P5	A13.16.
	UN0033	BOMBS, *with bursting charge*	1.1F		II	P4	A5.12.
	UN0034	BOMBS, *with bursting charge*	1.1D		II	P4	A5.12.
	UN0035	BOMBS, *with bursting charge*	1.2D		II	P4	A5.12.
	UN0291	BOMBS, *with bursting charge*	1.2F		II	P4	A5.12.
		Bombs, illuminating or Bombs, target identification,, see AMMUNITION, ILLUMINATING					
	UN0038	BOMBS, PHOTO-FLASH	1.1D		II	P4	A5.12.
	UN0037	BOMBS, PHOTO-FLASH	1.1F		II	P4	A5.12.
	UN0039	BOMBS, PHOTO-FLASH	1.2G		II	P4	A5.12.
	UN0299	BOMBS, PHOTO-FLASH	1.3G		II	P4	A5.12.
	UN2028	BOMBS, SMOKE, NON-EXPLOSIVE, *with corrosive liquid, without initiating device*	8		II	P4	A12.5.
	UN0399	BOMBS WITH FLAMMABLE LIQUID, *with bursting charge*	1.1J		II	P3	A5.3.
	UN0400	BOMBS WITH FLAMMABLE LIQUID, *with bursting charge*	1.2J		II	P3	A5.3.
	UN0042	BOOSTERS, *without detonator*	1.1D		II	P4	A5.15.
	UN0283	BOOSTERS, *without detonator*	1.2D		II	P4	A5.15.
	UN0225	BOOSTERS WITH DETONATOR	1.1B		II	P4	A5.16.
	UN0268	BOOSTERS WITH DETONATOR	1.2B		II	P4	A5.16.
		Borate and chlorate mixture, see CHLORATE AND BORATE MIXTURE					
	UN1312	BORNEOL	4.1		III	P5, A1	A8.3.
+	UN2692	BORON TRIBROMIDE	8	6.1	I	P2, 2, N34	A12.11.
	UN1741	BORON TRICHLORIDE	2.3	8		P2, 3	A6.4.
	UN1008	BORON TRIFLUORIDE	2.3			P2, 2	A6.5.
	UN1742	BORON TRIFLUORIDE ACETIC ACID COMPLEX, LIQUID	8		II	P4	A12.2.
	UN3419	BORON TRIFLUORIDE ACETIC ACID COMPLEX, SOLID	8		II	P5	A12.4.
	UN2604	BORON TRIFLUORIDE DIETHYL ETHERATE	8	3	I	P3, A19	A12.2.
	UN2851	BORON TRIFLUORIDE DIHYDRATE	8		II	P5	A12.3.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2965	BORON TRIFLUORIDE DIMETHYL ETHERATE	4.3	8, 3	I	P3, A19	A8.2.
	UN1743	BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, LIQUID	8		II	P4	A12.2.
	UN3420	BORON TRIFLUORIDE PROPRIONIC ACID COMPLEX, SOLID	8		II	P5	A12.4.
		Box toe gum, see NITROCELLULOSE					
★	UN1450	BROMATES, INORGANIC, N.O.S.	5.1		II	P5	A9.6.
★	UN3213	BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		II III	P4	A9.5.
+	UN1744	BROMINE *or* BROMINE SOLUTIONS	8	6.1	I	P1, 1, A3, A6, N34, N43	A12.11.
		Bromine azide					FORBIDDEN
	UN2901	BROMINE CHLORIDE	2.3	5.1, 8		P2, 2, N86	A6.4.
+	UN1745	BROMINE PENTAFLUORIDE	5.1	6.1, 8	I	P1, 1	A9.9.
+	UN1746	BROMINE TRIFLUORIDE	5.1	6.1, 8	I	P2, 2	A9.9.
	UN3425	BROMOACETIC ACID, SOLID	8		II	P5, A7, N34	A12.3.
	UN1938	BROMOACETIC ACID, SOLUTION	8		II III	P4, A7 P5	A12.2. A12.2
+	UN1569	BROMOACETONE	6.1	3	II	P2, 2	A10.3.
		omega-Bromoacetophenone, see PHENACYL BROMIDE					
	UN2513	BROMOACETYL BROMIDE	8		II	P5	A12.2.
	UN2514	BROMOBENZENE	3		III	P5	A7.2.
		p-Bromobenzyl cyanide					FORBIDDEN
	UN1694	BROMOBENZYL CYANIDES, LIQUID	6.1		I	P3	A10.4.
	UN3449	BROMOBENZYL CYANIDES, SOLID	6.1		I	P5	A10.5.
	UN1126	1-BROMOBUTANE	3		II	P5	A7.2
	UN2339	2-BROMOBUTANE	3		II	P5	A7.2.
	UN1887	BROMOCHLOROMETHANE	6.1		III	P5	A10.4.
	UN2688	1-BROMO-3-CHLOROPROPANE	6.1		III	P5	A10.4.
		4-Bromo-1, 2-dinitrobenzene					FORBIDDEN
		1-Bromo-2,3-epoxypropane, see EPIBROMOHYDRIN					
		Bromoethane, see ETHYL BROMIDE					
	UN2340	2-BROMOETHYL ETHYL ETHER	3		II	P5	A7.2.
	UN2515	BROMOFORM	6.1		III	P5	A10.4.
		Bromoethane, see METHYL BROMIDE					
	UN2341	1-BROMO-3-METHYLBUTANE	3		III	P5	A7.2.
	UN2342	BROMOMETHYLPROPANES	3		II	P5	A7.2.
	UN3241	2-BROMO-2-NITROPROPANE-1,3,-DIOL	4.1		III	P5, 46	A8.3.
		1Bromo-3-Nitrobenzene (unstable at 56 degrees C)					FORBIDDEN
	UN2343	2-BROMOPENTANE	3		II	P5	A7.2.
	UN2344	BROMOPROPANES	3		II III	P5 P5	A7.2. A7.2.
	UN2345	3-BROMOPROPYNE	3		II	P5	A7.2.
		Bromosilane					FORBIDDEN
		Bromotoluene-alpha; see BENZYL BROMIDE					
	UN2419	BROMOTRIFLUOROETHYLENE	2.1			P4	A6.4.
	UN1009	BROMOTRIFLUOROMETHANE *(R13B1)*	2.2			P5	A6.3., A6.4.
	UN2212	BROWN ASBESTOS	9		II	P5	A13.16.
	UN1570	BRUCINE	6.1		I	P3	A10.5.
	UN0043	BURSTERS, *explosive*	1.1D		II	P4	A5.16.
	UN1010	BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED, *containing more than 40% butadienes*	2.1			P4	A6.3., A6.4.
	UN1010	BUTADIENES, STABILIZED	2.1			P4	A6.3., A6.4.
		Butadienes, unstabilized					FORBIDDEN

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1011	BUTANE, *see also* PETROLEUM GASES, LIQUEFIED	2.1			P4	A6.3., A6.6.
		Butane, butane mixtures and mixtures having similar properties in cartridges each not exceeding 500 grams see RECEPTACLES, SMALL, CONTAINING GAS, *etc.*					
	UN2346	BUTANEDIONE	3		II	P5	A7.2.
		Butane-1-thiol, see BUTYL MERCAPTAN					
		1,2,4-Butanetriol trinitrate					FORBIDDEN
		Butan-2-ol or 1-Butanol, see BUTANOLS					
	UN1120	BUTANOLS	3		II III	P5 P5	A7.2. A7.2.
		Butanol, secondary or Butanol tertiary, see BUTANOLS					
		Butanone, see ETHYL METHYL KETONE					
		2-Butenal, see CROTONALDEHYDE					
		Butene, see BUTYLENE					
		But-1-ene-3-one, see METHYL VINYL KETONE STABILIZED					
		1,2-Buteneoxide, see 1,2-BUTYLENE OXIDE, STABILIZED					
		2-Buten-1-ol, see METHALLYL ALCOHOL					
		Tert-Butoxycarbonyl azide					FORBIDDEN
		Butter of antimony, see ANTIMONY TRICHLORIDE SOLID					
		Butter of arsenic, see ARSENIC TRICHLORIDE					
		Butyl acetate, iso, see BUTYL ACETATES					
	UN1123	BUTYL ACETATES	3		II III	P5 P5	A7.2. A7.2.
		Butyl acetates, secondary, see BUTANOLS					
	UN1718	BUTYL ACID PHOSPHATE	8		III	P5	A12.2.
	UN2348	BUTYL ACRYLATES, STABILIZED	3		III	P5	A7.2.
		Butyl alcohols, see BUTANOLS					
		Butyl alcohol, secondary, see BUTANOLS					
		Butyl alcohol, tertiary, see BUTANOLS					
	UN1125	N-BUTYLAMINE	3	8	II	P5	A7.2.
	UN2738	N-BUTYLANILINE	6.1		II	P5	A10.4.
		sec-Butylbenzene, see BUTYLBENZENES					
	UN2709	BUTYL BENZENES	3		III	P5	A7.2.
		n-Butyl bromide, see 1-BROMOBUTANE					
		n-Butyl chloride, see CHLOROBUTANES					
	UN2743	N-BUTYL CHLOROFORMATE	6.1	8, 3	I	P2, 2	A10.6.
	UN2747	TERT-BUTYLCYCLOHEXYL-CHLOROFOR MATE	6.1		III	P5	A10.4.
	UN1012	BUTYLENE	2.1			P4,	A6.6.
	UN3022	1,2-BUTYLENE OXIDE, STABILIZED	3		II	P5	A7.2.
		Butyl ethers, see DIBUTYL ETHERS					
		Butyl ethyl ether, see ETHYL BUTYL ETHER					
	UN1128	N-BUTYL FORMATE	3		II	P5	A7.2.
		t*ert-Butyl Hydroperoxide, more than 90% with water*					FORBIDDEN
	UN3255	TERT-BUTYL HYPOCHLORITE	4.2	8	I	P3	A8.3.
	UN2690	N-n-BUTYL IMIDAZOLE	6.1		II	P5	A10.4.
		N-n-Butyl iminazole see N-n- BUTYL IMIDAZOLE					
	UN2484	tert-BUTYL ISOCYANATE	6.1	3	I	P1, 1	A10.6.
	UN2485	n-BUTYL ISOCYANATE	6.1	3	I	P2, 2	A10.6.
	UN2347	BUTYL MERCAPTANS	3		II	P5, A3	A7.2.
	UN2227	n-BUTYL METHACRYLATE, STABILIZED	3		III	P5	A7.2.
	UN2350	BUTYL METHYL ETHER	3		II	P5	A7.2.
		tert-Butyl menoperoxymaleate, more than 52%					FORBIDDEN
		tert-Butyl monoperoxyphthalate					FORBIDDEN

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2351	BUTYL NITRITES	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
		tert-Butyl peroxyacetate, more than 52% and less than 77%, when with more than 23% diluent type B					FORBIDDEN
		tert-Butyl peroxyisobutyrate, more than 52% and less or equal to 77%, when with more than or equal to 23% diluent type B					FORBIDDEN
		tert-Butyl peroxy acetate, with more than 75% in solution					FORBIDDEN
		n-Butyl peroxydicarbonate with more than 52% in solution					FORBIDDEN
		tert- Butyl peroxyisobutyrate with more than 77% in solution					FORBIDDEN
		Butylphenols, liquid, see ALKYLPHENOLS, LIQUID, N.O.S.					
		Butylphenols, solid, see ALKYLPHENOLS, SOLID, N.O.S.					
		Butyl phosphoric acid, see BUTYL ACID PHOSPHATE					
	UN1914	BUTYL PROPIONATES	3		III	P5	A7.2.
		p-tert-Butyl-toluene, see BUTYLTOLUENES					
	UN2667	BUTYLTOLUENES	6.1		III	P5	A10.4.
	UN1747	BUTYLTRICHLOROSILANE	8	3	II	P4, A7, N34	A12.2.
	UN2956	5-TERT-BUTYL-2,4,6-TRINITRO-M-XYLENE *or* MUSK XYLENE	4.1		III	P5	A8.4.
	UN2352	BUTYL VINYL ETHER, STABILIZED	3		II	P5	A7.2.
		Butyl vinyl ether, unstabilized					FORBIDDEN
		But-1-yne, see ETHYLACETYLENE, STABILIZED					
		2-Butyne-1,4-diol, see 1,4-BUTYNEDIOL					
	UN2716	1,4-BUTYNEDIOL	6.1		III	P5, A1	A10.5.
	UN1129	BUTYRALDEHYDE	3		II	P5	A7.2.
	UN2840	BUTYRALDOXIME	3		III	P5	A7.2.
	UN2820	BUTYRIC ACID	8		III	P5	A12.2.
	UN2739	BUTYRIC ANHYDRIDE	8		III	P5	A12.2.
		Butyrone, see DIPROPYL KETONE					
	UN2411	BUTYRONITRILE	3	6.1	II	P4	A7.2.
		Butyroyl chloride, see BUTYRYL CHLORIDE					
	UN2353	BUTYRYL CHLORIDE	3	8	II	P5	A7.2.
		Cable cutters, explosive, see CUTTERS, CABLE, EXPLOSIVE					
	UN1572	CACODYLIC ACID	6.1		II	P5	A10.5.
★	UN2570	CADMIUM COMPOUNDS	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN1407	CAESIUM *or* CESIUM	4.3		I	P3, A19, N34, N40	A8.3.
		Caffeine, see ALKALOIDS, SOLID, N.O.S. *or* ALKALOIDS, LIQUID, N.O.S.					
		Cajeputene, see DIPENTENE					
	UN2682	CAESIUM HYDROXIDE	8		II	P5	A12.3.
	UN2681	CAESIUM HYDROXIDE SOLUTION	8		II III	P5 P5	A12.2. A12.2.
	UN1451	CAESIUM NITRATE *or* CESIUM NTIRATE	5.1		III	P5, A1, A29	A9.6.
	UN1401	CALCIUM	4.3		II	P5	A8.3.
	UN1855	CALCIUM ALLOYS, PYROPHORIC	4.2		I	P3	A8.11.
	UN1573	CALCIUM ARSENATE	6.1		II	P5	A10.5.
	UN1574	CALCIUM ARSENATE AND CALCIUM ARSENITE MIXTURES, SOLID	6.1		II	P5	A10.5.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Calcium bisulfite solutions, see BISULFITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.					
	UN1402	CALCIUM CARBIDE	4.3		I II	P3, A1, A8, N34 P5, A1, A8, N34	A8.3. A8.3.
	UN1452	CALCIUM CHLORATE	5.1		II	P5, A9, N34	A9.6.
	UN2429	CALCIUM CHLORATE, AQUEOUS SOLUTION	5.1		II III	P5, A2, N41 P5, A2, N41	A9.5. A9.5.
	UN1453	CALCIUM CHLORITE	5.1		II	P5, A9, N34	A9.6.
	UN1403	CALCIUM CYANAMIDE *with more than 0.1% of calcium carbide*	4.3		III	P5, A1, A19	A8.3.
	UN1575	CALCIUM CYANIDE	6.1		I	P5, N79	A10.5.
	UN1923	CALCIUM DITHIONITE *or* CALCIUM HYDROSULPHITE	4.2		II	P5, A19, A20	A8.3.
	UN1404	CALCIUM HYDRIDE	4.3		I	P3, A19, N40	A8.3.
		CALCIUM HYDROSULPHITE, *see* CALCIUM DITHIONITE					
	UN1748	CALCIUM HYPOCHLORITE, DRY *or* CALCIUM HYPOCHLORITE MIXTURES, DRY *with more than 39% available chlorine (8.8% available oxygen)*	5.1		II III	P5, 165, A7, A9, N34 P5, A7, A9, N34	A9.6. A9.6.
	UN3485	CALCIUM HYPOCHLORITE, DRY, CORROSIVE *or* CALCIUM HYPOCHLORITE MIXTURES, DRY,CORROSIVE *with more than 39% available chlorine (8.8% available oxygen)*	5.1	8	II	P5, 165, A7, A9, N34	A9.6.
	UN2880	CALCIUM HYPOCHLORITE, HYDRATED *or* CALCIUM HYPOCHLORITE, HYDRATED MIXTURES, *with not less than 5.5% but not more than 16% water*	5.1		II	P5	A9.6.
	UN3487	CALCIUM HYPOCHLORITE, HYDRATED, CORROSIVE *or* CALCIUM HYPOCHLORITE, HYDRATED MIXTURES, CORROSIVE *with not less than 5.5% but not more than 16% water*	5.1	8	II III	P5, 165 P5, 165	A9.6. A9.6.
	UN2208	CALCIUM HYPOCHLORITE MIXTURES, DRY *with more than 10%, but not more than 39% available chlorine*	5.1		III	P5, A1, A29, N34	A9.6.
	UN2208	CALCIUM HYPOCHLORITE MIXTURES, DRY, CORROSIVE *with more than 10%, but not more than 39% available chlorine*	5.1	8	III	P5, 165, A1, A29, N34	A9.6.
	UN2844	CALCIUM MANGANESE SILICON	4.3		III	P5, A1, A19	A8.3.
	UN1454	CALCIUM NITRATE	5.1		III	P5	A9.6.
	UN1910	CALCIUM OXIDE	8		III	P5	A12.3.
	UN1455	CALCIUM PERCHLORATE	5.1		II	P5	A9.6.
	UN1456	CALCIUM PERMANGANATE	5.1		II	P5	A9.6.
	UN1457	CALCIUM PEROXIDE	5.1		II	P5	A9.6.
	UN1360	CALCIUM PHOSPHIDE	4.3	6.1	I	P3, A8, A19, N40	A8.3.
	UN1855	CALCIUM, PYROPHORIC *or* CALCIUM ALLOYS, PYROPHORIC	4.2		I	P3	A8.11.
	UN1313	CALCIUM RESINATE	4.1		III	P5, A1, A19	A8.3.
	UN1314	CALCIUM RESINATE, FUSED	4.1		III	P5, A1, A19	A8.3.
		Calcium selenate; see SELENATES *or* SELENITES					
	UN1405	CALCIUM SILICIDE	4.3		II III	P5, A19 P5, A1, A19	A8.3. A8.3.
		Calcium silicon, see CALCIUM SILICIDE					
		Calcium superoxide, see CALCIUM PEROXIDE					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Calor gas, see HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S. *or* HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.					
		Camphanone, see CAMPHOR					
	UN2717	CAMPHOR, *synthetic*	4.1		III	P5, A1	A8.3.
	UN1130	CAMPHOR OIL	3		III	P5	A7.2.
		Camping gas, see RECEPTACLES, SMALL, CONTAINING GAS					
		Candles, gas, see LIGHTERS					
		Cannon primers, see PRIMERS, TUBULAR					
	UN2829	CAPROIC ACID	8		III	P5	A12.2.
		Caps, blasting, see DETONATORS, *etc*					
		Caps, prime, see PRIMERS, CAP TYPE					
		Caps, toy, see FIREWORKS					
★	UN2758	CARBAMATE PESTICIDES, LIQUID, FLAMMABLE, TOXIC, *flashpoint less than 23 degrees C*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN2992	CARBAMATE PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2991	CARBAMATE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, *flashpoint not less than 23 degrees C*	6.1	3 3 3	I II III	P3 P4 P5	A10.4 A10.4. A10.4.
★	UN2757	CARBAMATE PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Carbolic acid, see PHENOL, SOLID, *or* PHENOL, MOLTEN					
		Carbolic acid solutions, see PHENOL SOLUTIONS					
	UN1361	CARBON, *animal or vegetable origin*	4.2		II III	P5 P5	A8.3. A8.3.
	UN1362	CARBON, ACTIVATED	4.2		III	P5	A8.3.
		Carbon bisulfide, see CARBON DISULFIDE					
		Carbon black (animal or vegetable origin);see CARBON					
	UN1013	CARBON DIOXIDE	2.2			P5	A6.3., A6.4., A6.5.
		Carbon dioxide and ethylene oxide mixture, see ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE, *etc.*					
	UN2187	CARBON DIOXIDE, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2			P5	A6.3., A6.11.
	UN1845	CARBON DIOXIDE, SOLID *or* DRY ICE	9			P5	A13.10.
	UN1131	CARBON DISULFIDE	3	6.1	I		FORBIDDEN
		Carbonic anhydride, see CARBON DIOXIDE					
	UN1016	CARBON MONOXIDE, COMPRESSED	2.3	2.1		P2, 4	A6.5.
		Carbon oxysulfide, see CARBONYL SULPHIDE					
		Carbon paper, see PAPER, UNSATURATED OIL TREATED					
D	NA9202	CARBON MONOXIDE, REFRIGERATED LIQUID *(cryogenic liquid)*	2.3	2.1		P2, 4	A6.11.
	UN2516	CARBON TETRABROMIDE	6.1		III	P5	A10.5.
	UN1846	CARBON TETRACHLORIDE	6.1		II	P5, N36	A10.4.
		Carbonyl chloride, see PHOSGENE					
	UN2417	CARBONYL FLUORIDE	2.3	8		P2, 2	A6.5.
	UN2204	CARBONYL SULFIDE	2.3	2.1		P2, 3	A6.4.
		Cartridge cases, empty primed, see CASES, CARTRIDGE, EMPTY WITH PRIMER					

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Cartridges, actuating for aircraft ejector seat catapult, fire extinguisher, canopy removal or apparatus, see CARTRIDGES, POWER DEVICE					
		Cartridges, explosive, see CHARGES, DEMOLITION					
	UN0049	CARTRIDGES, FLASH	1.1G		II	P4	A5.18.
	UN0050	CARTRIDGES, FLASH	1.3G		II	P4	A5.18.
	UN0005	CARTRIDGES FOR WEAPONS, *with bursting charge*	1.1F		II	P4	A5.12.
	UN0007	CARTRIDGES FOR WEAPONS, *with bursting charge*	1.2F		II	P4	A5.12.
	UN0348	CARTRIDGES FOR WEAPONS, *with bursting charge*	1.4F		II	P5	A5.12.
	UN0412	CARTRIDGES FOR WEAPONS, *with bursting charge*	1.4E		II	P5	A5.12.
	UN0006	CARTRIDGES FOR WEAPONS, *with bursting charge*	1.1E		II	P4	A5.12.
	UN0321	CARTRIDGES FOR WEAPONS, *with bursting charge*	1.2E		II	P4	A5.12.
	UN0326	CARTRIDGES FOR WEAPONS, BLANK	1.1C		II	P4	A5.12.
	UN0413	CARTRIDGES FOR WEAPONS, BLANK	1.2C		II	P4	A5.12.
	UN0327	CARTRIDGES FOR WEAPONS, BLANK; *or* CARTRIDGES, SMALL ARMS, BLANK	1.3C		II	P4	A5.12.
	UN0338	CARTRIDGES FOR WEAPONS, BLANK; *or* CARTRIDGES, SMALL ARMS, BLANK	1.4C		II	P5, A69	A5.12.
	UN0014	CARTRIDGES FOR WEAPONS, BLANK*; or* CARTRIDGES, SMALL ARMS, BLANK	1.4S		II	P5, 112, A69	A5.12.
	UN0328	CARTRIDGES FOR WEAPONS, INERT PROJECTILE	1.2C		II	P4	A5.12.
	UN0417	CARTRIDGES FOR WEAPONS, INERT PROJECTILE *or* CARTRIDGES, SMALL ARMS	1.3C		II	P4	A5.12.
	UN0339	CARTRIDGES FOR WEAPONS, INERT PROJECTILE *or* CARTRIDGES, SMALL ARMS	1.4C		II	P5, A69	A5.12.
	UN0012	CARTRIDGES FOR WEAPONS, INERT PROJECTILE *or* CARTRIDGES, SMALL ARMS	1.4S		II	112, P5, A69	A5.12.
		Cartridges, illuminating, see AMMUNITION ILLUMINATING, *etc*					
	UN0277	CARTRIDGES, OIL WELL	1.3C		II	P4, A69	A5.17.
	UN0278	CARTRIDGES, OIL WELL	1.4C		II	P5, A69	A5.17.
	UN0275	CARTRIDGES, POWER DEVICE	1.3C		II	P4	A5.17.
	UN0276	CARTRIDGES, POWER DEVICE	1.4C		II	P5, 110	A5.17.
	UN0381	CARTRIDGES, POWER DEVICE	1.2C		II	P4	A5.17.
	UN0323	CARTRIDGES, POWER DEVICE	1.4S		II	P5, 110, 112, 347, A69	A5.17.
		Cartridges, safety, blank, see CARTRIDGES FOR WEAPONS, BLANK					
		Cartridges, safety, see CARTRIDGES, FOR WEAPONS, INERT PROJECTILES, *or* CARTRIDGES, SMALL ARMS, *or* CARTRIDGES POWER DEVICE					
	UN0054	CARTRIDGES, SIGNAL	1.3G		II	P4	A5.18.
	UN0312	CARTRIDGES, SIGNAL	1.4G		II	P5	A5.18.
	UN0405	CARTRIDGES, SIGNAL	1.4S		II	P5, A69	A5.18.
		CARTRIDGES, SMALL ARMS; *see* CARTRIDGES FOR WEAPONS, INERT PROJECTILE					
		CARTRIDGES, SMALL ARMS, BLANK, *see* CARTRIDGES FOR WEAPONS, BLANK					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Cartridges, sporting, see CARTRIDGES FOR WEAPONS, INERT PROJECTILE, *or* CARTRIDGES, SMALL ARMS					
		Cartridges, starter, jet engine, see CARTRIDGES, POWER DEVICE					
		Case oil, see MOTOR SPIRIT *or* PETROLEUM DISTILLATES, N.O.S.					
	UN0379	CASES, CARTRIDGE, EMPTY WITH PRIMER	1.4C		II	P5, A69	A5.19.
	UN0055	CASES, CARTRIDGE, EMPTY WITH PRIMER	1.4S		II	P5, A69	A5.19.
	UN0447	CASES, COMBUSTIBLE, EMPTY WITHOUT PRIMER	1.3C		II	P4	A5.19.
	UN0446	CASES, COMBUSTIBLE, EMPTY WITHOUT PRIMER	1.4C		II	P5	A5.19.
		Casinghead gasoline, see GASOLINE					
	UN2969	CASTOR BEANS *or* CASTOR MEAL *or* CASTER POMACE *or* CASTOR FLAKE	9		II	P5	A13.2.
★	UN1719	CAUSTIC ALKALI LIQUIDS, N.O.S.	8		II III	P4 P5	A12.2. A12.2.
		Caustic antimony, see ANTIMONY TRICHLORIDE SOLID *or* ANTIMONY TRICHLORIDE SOLUTION					
		Caustic arsenic chloride, see ARSENIC TRICHLORIDE					
		Caustic potash, see POTASSIUM HYDROXIDE, SOLUTION, *etc*					
		Caustic soda, see SODIUM HYDROXIDE, , SOLID *or* SODIUM HYDROXIDE SOLUTION					
		Caustic soda liquor, see SODIUM HYDROXIDE SOLUTION					
		Cellosolve, see ETHYLENE GLYCOL MONOETHYL ETHER					
		Cellosolve acetate, see ETHYLENE GLYCOL MONOETHYL ETHER ACETATE					
	UN3292	CELLS, CONTAINING SODIUM	4.3		II	P4	A8.18.
	UN2000	CELLULOID, *in blocks, rods, rolls, sheets, tubes, etc. except scrap*	4.1		III	P5	A8.3.
	UN2002	CELLULOID, SCRAP	4.2		III	P5	A8.3.
		Cement flammable, see ADHESIVES *containing flammable liquid*					
	UN1333	CERIUM, *slabs, ingots, or rods*	4.1		II	P5, N34	A8.3.
	UN3078	CERIUM, *turnings or gritty powder*	4.3		II	P5, A1	A8.3.
		Cer mischmetall, see FERROCERIUM					
	UN1407	CESIUM *or* CAESIUM	4.3		I	P3, A7, A19, N34, N40	A8.3.
	UN1451	CESIUM NITRATE *or* CAESIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
		Charcoal activated, see CARBON ACTIVATED					
		Charcoal non-activated, see CARBON					
		Charcoal screenings, wet					FORBIDDEN
		Charcoal, wet					FORBIDDEN
D	NA1361	CHARCOAL *briquettes, shell, screenings, wood, etc.*	4.2		III	P5	A8.3.
		Charcoal, wet					FORBIDDEN
	UN0457	CHARGES, BURSTING, PLASTICS BONDED	1.1D		II	P4	A5.12.
	UN0458	CHARGES, BURSTING, PLASTICS BONDED	1.2D		II	P4	A5.12.
	UN0459	CHARGES, BURSTING, PLASTICS BONDED	1.4D		II	P5	A5.12.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN0460	CHARGES, BURSTING, PLASTICS BONDED	1.4S		II	P5, 347, A69	A5.12.
	UN0048	CHARGES, DEMOLITION	1.1D		II	P4, A69	A5.12.
	UN0056	CHARGES, DEPTH	1.1D		II	P4	A5.12.
		Charges, expelling, explosive, for fire extinguishers, see CARTRIDGES, POWER DEVICE					
	UN0442	CHARGES, EXPLOSIVE, COMMERCIAL *without detonator*	1.1D		II	P4, A69	A5.20.
	UN0443	CHARGES, EXPLOSIVE, COMMERCIAL *without detonator*	1.2D		II	P4, A69	A5.20.
	UN0444	CHARGES, EXPLOSIVE, COMMERCIAL *without detonator*	1.4D		II	P5, A69	A5.20.
	UN0445	CHARGES, EXPLOSIVE, COMMERCIAL *without detonator*	1.4S		II	P5, 347, A69	A5.20.
	UN0271	CHARGES, PROPELLING	1.1C		II	P4	A5.26.
	UN0415	CHARGES, PROPELLING	1.2C		II	P4	A5.26.
	UN0272	CHARGES, PROPELLING	1.3C		II	P4	A5.26.
	UN0491	CHARGES, PROPELLING	1.4C		II	P5	A5.26.
	UN0279	CHARGES, PROPELLING, FOR CANNON	1.1C		II	P4	A5.12.
	UN0414	CHARGES, PROPELLING, FOR CANNON	1.2C		II	P4	A5.12.
	UN0242	CHARGES, PROPELLING, FOR CANNON	1.3C		II	P4	A5.12.
	UN0059	CHARGES, SHAPED, *without detonator*	1.1D		II	P4	A5.20.
	UN0439	CHARGES, SHAPED, *without detonator*	1.2D		II	P4	A5.20.
	UN0440	CHARGES, SHAPED, *without detonator*	1.4D		II	P5	A5.20.
	UN0441	CHARGES, SHAPED, *without detonator*	1.4S		II	P5, 347, A69	A5.20.
	UN0288	CHARGES, SHAPED, FLEXIBLE, LINEAR	1.1D		II	P4, A69	A5.21.
	UN0237	CHARGES, SHAPED, FLEXIBLE, LINEAR	1.4D		II	P5, A69	A5.21.
	UN0060	CHARGES, SUPPLEMENTARY, EXPLOSIVE	1.1D		II	P4	A5.15.
	NA1760	CHEMICAL KITS	8		II	P5	A12.6.
	UN3316	CHEMICAL KITS	9			P5	A13.18.
	UN3315	CHEMICAL SAMPLE, TOXIC					FORBIDDEN
		Chile saltpeter, see SODIUM NITRATE					
	UN2075	CHLORAL, ANHYDROUS, STABILIZED	6.1		II	P5	A10.5.
		Chloral, anhydrous, unstabilized					FORBIDDEN
	UN1458	CHLORATE AND BORATE MIXTURES	5.1		II III	P5, A9, N34 P5, A9, N34	A9.6. A9.6.
	UN1459	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLID	5.1		II III	P5, A9, N34 P5, A9, N34	A9.6. A9.6.
	UN3407	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE SOLUTION	5.1		II III	P5, A9, N34 P5, A9, N34	A9.5. A9.5.
		Chlorate of potash, see POTASSIUM CHLORATE					
		Chlorate of soda, see SODIUM CHLORATE					
	UN1461	CHLORATES, INORGANIC, N.O.S.	5.1		II	P5, A9, N34	A9.6.
	UN3210	CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		II III	P5 P5	A9.5. A9.5.
	UN2626	CHLORIC ACID AQUEOUS SOLUTION, *with not more than 10% chloric acid*	5.1		II		FORBIDDEN
		Chloric acid, aqueous solution with more than 10% chloric acid					FORBIDDEN
		Chloride of phosphourous, see PHOSPHORUS TRICHLORIDE					
		Chloride of sulphur, see SULPHUR CHLORIDE					
		Chlorinated lime, see CALCIUM HYPOCHLORITE MIXTURES *or* CALCIUM HYPOCHLORITE, DRY *or* CALCIUM HYPOCHLORITE HYDRATED					
	UN1017	CHLORINE	2.3	5.1, 8		P2, 2, N86	A6.4.
		Chlorine azide					FORBIDDEN

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Chlorine dioxide (not hydrate)					FORBIDDEN
D	NA9191	CHLORINE DIOXIDE HYDRATE, FROZEN	5.1	6.1			FORBIDDEN
	UN2548	CHLORINE PENTAFLUORIDE	2.3	5.1, 8		P1, 1, N86	A6.4.
	UN1749	CHLORINE TRIFLUORIDE	2.3	5.1, 8		P2, 2, N86	A6.4.
	UN1908	CHLORITE SOLUTION	8		II III	P5, A3, A6, A7, N34 P5, A3, A6, A7, N34	A12.2. A12.2.
		Chloroacetaldehyde, see 2-CHLOROETHANAL					
	UN1462	CHLORITES, INORGANIC, N.O.S.	5.1		II	P5, A7, N34	A9.6.
	UN2517	1-CHLORO-1, 1-DIFLUOROETHANES *or* REFRIGERANT GAS R142B	2.1			P4	A6.3., A6.4.
	UN2236	3-CHLORO-4-METHYLPHENYL ISOCYANATE, LIQUID	6.1		II	P5	A10.4.
	UN3428	3-CHLORO-4-METHYLPHENYL ISOCYANATE, SOLID	6.1		II	P5	A10.5
		1-Chloro-2-methylpropane, see CHLOROBUTANES					
		2 Chloro-2-methylopropane, see CHLOROBUTANES					
		3-Chloro-2-methylprop-1-ene, see METHYLALLYL CHLORIDE					
	UN1021	1-CHLORO-1,2,2,2-TETRAFLUOROETHANE *or* REFRIGERANT GAS R124	2.2			P5	A6.3., A6.4.
	UN1579	4-CHLORO-O-TOLUIDINE HYDROCHLORIDE, SOLID	6.1		III	P5	A10.5.
	UN3410	4-CHLORO-O-TOLUIDINE HYDROCHLORIDE, SOLUTION	6.1		III	P5	A10.4
	UN1983	1-CHLORO-2,2,2-TRIFLUOROETHANE *or* REFRIGERANT GAS R133A	2.2			P5	A6.3., A6.4.
	UN3250	CHLOROACETIC ACID, MOLTEN	6.1	8	II		FORBIDDEN
	UN1751	CHLOROACETIC ACID, SOLID	6.1	8	II	P5, A3, A7, N34	A10.5.
	UN1750	CHLOROACETIC ACID, SOLUTION	6.1	8	II	P4, A7, N34	A10.4.
	UN1695	CHLOROACETONE, STABILIZED	6.1	3, 8	I	P5, 2, N12, N32, N34	A10.6.
		Chloroacetone (unstabilized)					FORBIDDEN
+	UN2668	CHLOROACETONITRILE	6.1	3	II	P2, 2	A10.6.
	UN3416	CHLOROACETOPHENONE, LIQUID	6.1		II	P5, A3, N12, N32, N33	A10.4.
	UN1697	CHLOROACETOPHENONE, SOLID *(CN)*	6.1		II	P5, A3, N12, N32, N33, N34	A10.5.
	UN1752	CHLOROACETYL CHLORIDE	6.1	8	I	P2, 2, A3, A6, A7, N34, N43	A12.11.
	UN2019	CHLOROANILINES, LIQUID	6.1		II	P5	A10.4.
	UN2018	CHLOROANILINES, SOLID	6.1		II	P5	A10.5.
	UN2233	CHLOROANISIDINES	6.1		III	P5	A10.5.
	UN1134	CHLOROBENZENE	3		III	P5	A7.2.
		Chlorobenzol, see CHLOROBENZENE					
	UN2234	CHLOROBENZOTRIFLUORIDES	3		III	P5	A7.2.
	UN2235	CHLOROBENZYL CHLORIDES, LIQUID	6.1		III	P5	A10.4.
	UN3427	CHLOROBENZYL CHLORIDES, SOLID	6.1		III		A10.5
		Chlorobromomethane, see BROMOCHLOROMETHANE					
		1-Chloro-3-bromopropane, see 1-BROMO-3-CHLOROPROPANE					
		1-Chlorobutane or 2-Chlorobutane, see CHLOROBUTANES					
	UN2688	1-CHLORO-3-BROMOPROPANE	6.1		III	P5	A10.4.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1127	CHLOROBUTANES	3		II	P5	A7.2.
	UN3437	CHLOROCRESOLS,SOLID	6.1		II	P5	A10.4.
	UN2669	CHLOROCRESOLS, SOLUTION	6.1		II III	P5 P5	A10.6. A10.6.
		3-Chloro-4-diethylaminobenzenediazonium zinc chloride,see SELF-REACTIVE SOLID TYPE D					
	UN1974	CHLORODIFLUOROBROMOMETHANE *or* REFRIGERANT GAS R12B1	2.2			P5	A6.3., A6.4.
	UN1018	CHLORODIFLUOROMETHANE *or* REFRIGERANT GAS R22	2.2			P5	A6.3., A6.4.
	UN1973	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE *or* REFRIGERANT GAS R502 *with fixed boiling point, with approximately 49% chlorodifluoromethane*	2.2			P5	A6.3., A6.4.
		3-Chloro-1,2-dihydroxypropane, see GLYCEROL ALPHA-MONOCHLOROHYDRIN					
		Chlorodimethyl, see METHYL CHLOROMETHYL ETHER					
+	UN1577	CHLORODINITROBENZENES, LIQUID	6.1		II	P5	A10.4.
+	UN3441	CHLORODINITROBENZENES, SOLID	6.1		II	P5	A10.5.
		Chlorodinitrobenzol, see CHLORODINITROBENZENES LIQUID *or* SOLID					
	UN2232	2-CHLOROETHANAL	6.1		I	P2, 2	A10.6.
		Chloroethane, see ETHYL CHLORIDE					
		Chloroethane nitrile, see CHLOROACETONITRILE					
		2-Choloroethanol, see ETHYLENE CHLOROHYDRIN					
	UN1888	CHLOROFORM	6.1		III	P5, N36	A10.4.
★	UN3277	CHLOROFORMATES, TOXIC, CORROSIVE, N.O.S.	6.1	8	II	P3	A10.4.
	UN2742	CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.	6.1	8, 3	II	P2, 5	A10.4.
		Chloromethane, see METHYL CHLORIDE					
		1-Chloro-3-methylbutane, see AMYL CHLORIDE					
		2-Chloro-2-methylbutane, see AMYL CHLORIDE					
	UN2745	CHLOROMETHYL CHLOROFORMATE	6.1	8	II	P4	A10.4.
		Chloromethyl cyanide, see CHLOROACETONEITRILE					
	UN2354	CHLOROMETHYL ETHYL ETHER	3	6.1	II	P4	A7.2.
		Chloromethyl methyl ether, see METHYL CHLOROMETHYL ETHER					
	UN2237	CHLORONITROANILINES	6.1		III	P5	A10.5.
+	UN3409	CHLORONITROBENZENES, LIQUID, *ortho*	6.1		II	P4	A10.4.
+	UN1578	CHLORONITROBENZENES, SOLID, *meta or para,*	6.1		II	P5	A10.5.
	UN2433	CHLORONITROTOLUENES, LIQUID	6.1		III	P5	A10.4.
	UN3457	CHLORONITROTOLUENES, SOLID	6.1		III	P5	A10.5.
	UN1020	CHLOROPENTAFLUOROETHANE *or* REFRIGERANT GAS R115	2.2			P5	A6.3., A6.4.
		3-Chloroperoxybenzoic acid,not less than 57% and no more than 86% when with more or equal to 14% inert.					FORBIDDEN
	UN2904	CHLOROPHENOLATES, LIQUID, *or* PHENOLATES, LIQUID	8		III	P5	A12.2.
	UN2905	CHLOROPHENOLATES, SOLID *or* PHENOLATES SOLID	8		III	P5	A12.3.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2021	CHLOROPHENOLS, LIQUID	6.1		III	P5	A10.4.
	UN2020	CHLOROPHENOLS, SOLID	6.1		III	P5	A10.5.
	UN1753	CHLOROPHENYLTRICHLOROSILANE	8		II	P4, A7, N34	A12.2.
+	UN1580	CHLOROPICRIN	6.1		I	P2, 2	A10.6.
	UN1581	CHLOROPICRIN AND METHYL BROMIDE MIXTURES *with more than 2% chloropicrin*	2.3			P2, 2, N86	A6.16.
	UN1582	CHLOROPICRIN AND METHYL CHLORIDE MIXTURES	2.3			P2, 2, N86	A6.16.
		Chloropicrun mixture, flammable (pressure not exceeding 14.7 psia at 115 degrees F flashpoint below 100 degrees F); see TOXIC LIQUIDS, FLAMMABLE, *etc*					
	UN1583	CHLOROPICRIN MIXTURES, N.O.S.	6.1		I II III	P2, 5 P3 P5	A10.4. A10.4. A10.4.
D	NA9263	CHLOROPIVALOYL CHLORIDE	6.1	8	I	P2, 2	A10.6.
	UN2507	CHLOROPLATINIC ACID, SOLID	8		III	P5	A12.3.
	UN1991	CHLOROPRENE, STABILIZED	3	6.1	I	P3	A7.2.
		Chloroprene, unstabilized or uninhibited					FORBIDDEN
	UN1278	1-CHLOROPROPANE	3		II	P5, N34	A7.2.
	UN2356	2-CHLOROPROPANE	3		I	P3, N36	A7.2.
		3-Chloro-propanediol-1,2, see GLYCEROL ALPHA-MONOCHLOROHYDRIN					
	UN2849	3-CHLOROPROPANOL-1	6.1		III	P5	A10.4.
		3-Choloropropene or 3-Chloroprop-1-ene , see ALLYL CHLORIDE					
	UN2456	2-CHLOROPROPENE	3		I	P3, A3, N36	A7.2.
	UN2511	2-CHLOROPROPIONIC ACID	8		III	P5	A12.2 A12.3
	UN2822	2-CHLOROPYRIDINE	6.1		II	P5	A10.4.
	UN2987	CHLOROSILANES, CORROSIVE N.O.S.	8		II	P4	A12.15.
	UN2986	CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S	8	3	II	P4	A12.15.
	UN2985	CHLOROSILANES, FLAMMABLE, CORROSIVE, N.O.S.	3	8	II	P4	A7.10.
	UN3361	CHLOROSILANES, TOXIC, CORROSIVE, N.O.S.	6.1	8	II	P5	A10.11.
	UN3362	CHLOROSILANES, TOXIC, CORROSIVE, FLAMMABLE N.O.S.	6.1	3, 8	II	P5	A10.11.
	UN2988	CHLOROSILANES, WATER REACTIVE, CORROSIVE, FLAMMABLE N.O.S.	4.3	3, 8	I	P3, A2	A8.2.
+	UN1754	CHLOROSULPHONIC ACID *(with or without sulphur trioxide)*	8	6.1	I	P2, 2, A3, A6, A10	A12.11.
	UN1021	1-CHLORO-1,2,2,2-TETRAFLUOROETHANE *or* REFRIGERANT GAS R124	2.2			P5	A6.3., A6.4.
	UN2238	CHLOROTOLUENES	3		III	P5	A7.2.
	UN3429	CHLOROTOLUIDINES, LIQUID	6.1		III	P5	A10.4
	UN2239	CHLOROTOLUIDINES, SOLID	6.1		III	P5	A10.4., A10.5.
	UN1022	CHLOROTRIFLUOROMETHANE *or* REFRIGERANT GAS R13	2.2			P5	A6.3., A6.4.
	UN2599	CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE *or* REFRIGERANT GAS R503 *with approximately 60% Chlorotrifluoromethane*	2.2			P5	A6.3., A6.4.
		Chromic acid, solid, see CHROMIUM TRIOXIDE, ANHYDROUS					
	UN1755	CHROMIC ACID, SOLUTION	8		II III	P5 P5	A12.2. A12.2.
		Chromic anhydride, see CHROMIUM TRIOXIDE, ANHYDROUS					
	UN1756	CHROMIC FLUORIDE, SOLID	8		II	P5	A12.3.

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1757	CHROMIC FLUORIDE, SOLUTION	8		II III	P5 P5	A12.2. A12.2.
		Chromic nitrate, see CHROMIUM NITRATE					
		Chromic trioxide, see CHROMIUM TRIOXIDE					
		Chromium (III) fluoride, solid, see CHROMIC FLUORIDE, SOLID					
		Chromium (III) nitrate, see CHROMIUM NITRATE					
	UN2720	CHROMIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
	UN1758	CHROMIUM OXYCHLORIDE	8		I	P3, A3, A6, A7, N34	A12.2.
	UN1463	CHROMIUM TRIOXIDE, ANHYDROUS	5.1	6.1, 8	II	P5	A9.6.
		Chromiun (VI) dichloride dioxide, see CHROMIUM OXYCHLORIDE					
	UN2240	CHROMOSULFURIC ACID	8		I	P3, A3, A6, A7, N34	A12.2.
		Chromyl chloride, see CHROMIUM OXYCHLORIDE					
		Chrysotile, see WHITE ASBESTOS					
		Cigar and cigarette lighter fluid, see FLAMMABLE LIQUID, N.O.S.					
		Cigar and cigarette lighters, charged with fuel, see LIGHTERS, *or* LIGHTER REFILLS *containing flammable gas.*					
		Cinene, see DIPENTENE					
		Cinnamene or Cinnamol, see STYRENE MONOMER, STABILIZED					
		Cleaning fluid or liquid, see FLAMMABLE LIQUID, TOXIC, N.O.S. *or* FLAMMABLE LIQUID, N.O.S. *or* FLAMMABLE LIQUID, CORROSIVE, N.O.S.					
	UN3291	CLINICAL WASTE, UNSPECIFIED, N.O.S., MEDICAL WASTE, N.O.S.	6.2		II	P5, A117	A10.10.
		Coal briquettes, hot					FORBIDDEN
	UN1023	COAL GAS, COMPRESSED	2.3	2.1		P2, 3	A6.5.
		Coal tar, crude and solvent, see PETROLEUM, PRODUCTS, NO.S.					
	UN1136	COAL TAR DISTILLATES, FLAMMABLE	3		II III	P5 P5	A7.2. A7.2.
		Coal tar dye, corrosive, liquid n.o.s., see DYES, LIQUID *or* SOLID N.O.S. *or* DYE INTERMEDIATES, LIQUID *or* SOLID, CORROSIVE N.O.S.					
		Coal tar naphtha, see PETROLEUM DISTILLATES, N.O.S. *or* PETROLEUM PRODUCTS, N.O.S.					
		Coal tar oil, see COAL TAR DISTILLATES, FLAMMABLE					
	UN1139	COATING SOLUTION *(includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining)*	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
		Cobalt catalyst, see METAL CATALYST, WETTED *or* METAL CATALYST, DRY					
	UN2001	COBALT NAPHTHENATES, POWDER	4.1		III	P5, A19	A8.3.
	UN1318	COBALT RESINATE, PRECIPITATED	4.1		III	P5, A1, A19	A8.3.
		Cocculus, see TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID *or* TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID SOLID, N.O.S.					
		Coir, see FABRICS, VEGETABLE, N.O.S. *or* FIBRES, VEGETABLE, N.O.S.					

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Coke, hot					FORBIDDEN
		Collodion cottons, see NITROCELLULOSE, *etc.*					
		Cologne spirits, see PERFUMERY PRODUCTS					
D	NA1993	COMBUSTIBLE LIQUID N.O.S.	COMBUS TIBLE LIQUID		III	P5	A7.2.
★	UN0461	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.1B		II	P4	A5.3.
★	UN0382	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.2B		II	P4	A5.3.
★	UN0383	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.4B		II	P5	A5.3.
★	UN0384	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.4S		II	P5, A69	A5.3.
		Composition B, see HEXOLITE *or* HEXOTOL.					
		Compound, anti-freeze, see FLAMMABLE LIQUID, N.O.S.					
★	NA1760	COMPOUNDS, CLEANING LIQUID	8		I II III	P3, A7 P5, N37 P5, N37	A12.2. A12.2. A12.2.
	NA1993	COMPOUNDS, CLEANING LIQUID	3		I II III	P3 P5 P5	A12.2 A12.2 A12.2
		Compound, cleaning liquid, flammable, see FLAMMABLE LIQUID, N.O.S.					
		Compounds, enamel, see PAINT, *etc.*					
★	NA1760	COMPOUNDS, TREE KILLING, LIQUID *or* COMPOUNDS WEED KILLING, LIQUID	8		I II III	P3, A7 P5, N37 P5, N37	A12.2. A12.2. A12.2.
★	NA1993	COMPOUNDS, TREE KILLING LIQUID *or* COMPOUNDS, WEED KILLING, LIQUID	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
★	NA2810	COMPOUNDS, TREE KILLING LIQUID *or* COMPOUNDS, WEED KILLING, LIQUID	6.1		I II III	P3 P5 P5	A10.4. A10.4. A10.4.
★	UN1956	COMPRESSED GAS, N.O.S.	2.2			P5	A6.3., A6.5.
		Compressed gas and hexaethyl tetraphosphate mixture, see HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE					
★	UN1954	COMPRESSED GAS, FLAMMABLE, N.O.S.	2.1			P4	A6.3., A6.5.
★	UN3156	COMPRESSED GAS, OXIDIZING, N.O.S.	2.2	5.1		P5	A6.3., A6.5.,
★	UN1955	COMPRESSED GAS, TOXIC, N.O.S., *Inhalation Hazard Zone A*	2.3			P1, 1	A6.15.
★	UN1955	COMPRESSED GAS, TOXIC, N.O.S., *Inhalation Hazard Zone B*	2.3			P2, 2	A6.5.
★	UN1955	COMPRESSED GAS, TOXIC, N.O.S., *Inhalation Hazard Zone C*	2.3			P2, 3	A6.5.
★	UN1955	COMPRESSED, GAS, TOXIC, N.O.S., *Inhalation Hazard Zone D*	2.3			P2, 4	A6.5.
★	UN3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. *Inhalation Hazard Zone A*	2.3	8		P1, 1	A6.15.
★	UN3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. *Inhalation Hazard Zone B*	2.3	8		P2, 2	A6.5.
★	UN3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. *Inhalation Hazard Zone C*	2.3	8		P2, 3	A6.5.
★	UN3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. *Inhalation Hazard Zone D*	2.3	8		P2, 4	A6.5.
★	UN3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. *Inhalation Hazard Zone A*	2.3	2.1, 8		P1, 1	A6.15.

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. *Inhalation Hazard Zone B*	2.3	2.1, 8		P2, 2	A6.5.
★	UN3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. *Inhalation Hazard Zone C*	2.3	2.1, 8		P2, 3	A6.5.
★	UN3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. *Inhalation Hazard Zone D*	2.3	2.1, 8		P2, 4	A6.5.
★	UN1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S., *Inhalation Hazard Zone A*	2.3	2.1		P1, 1	A6.15.
★	UN1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S., *Inhalation Hazard Zone B*	2.3	2.1		P2, 2	A6.5.
★	UN1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S., *Inhalation Hazard Zone C*	2.3	2.1		P2, 3	A6.5.
★	UN1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S., *Inhalation Hazard Zone D*	2.3	2.1		P2, 4	A6.5.
★	UN3306	COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S. *Inhalation Hazard Zone A*	2.3	5.1, 8		P1, 1	A6.15.
★	UN3306	COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S. *Inhalation Hazard Zone B*	2.3	5.1, 8		P2, 2	A6.5.
★	UN3306	COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S. *Inhalation Hazard Zone C*	2.3	5.1, 8		P2, 3	A6.5.
★	UN3306	COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S. *Inhalation Hazard Zone D*	2.3	5.1, 8		P2, 4	A6.5.
★	UN3303	COMPRESSED, GAS, TOXIC, OXIDING, N.O.S. *Inhalation Hazard Zone A*	2.3	5.1		P1, 1	A6.15.
★	UN3303	COMPRESSED, GAS, TOXIC, OXIDING, N.O.S. *Inhalation Hazard Zone B*	2.3	5.1		P2, 2	A6.5.
★	UN3303	COMPRESSED, GAS, TOXIC, OXIDING, N.O.S. *Inhalation Hazard Zone C*	2.3	5.1		P2, 3	A6.5.
★	UN3303	COMPRESSED, GAS, TOXIC, OXIDING, N.O.S. *Inhalation Hazard Zone D*	2.3	5.1		P2, 4	A6.5.
	ID8000	CONSUMER COMMODITY	9			P5, A503	A13.3.
D		CONSUMER COMMODITY	ORM-D			P5, 112, A503, A504	A13.3.
★	UN0248	CONTRIVANCES, WATER-ACTIVATED, *with burster, expelling charge or propelling charge*	1.2L		II	P3	A5.27.
★	UN0249	CONTRIVANCES, WATER-ACTIVATED, *with burster, expelling charge or propelling charge*	1.3L		II	P3	A5.27.
	UN1585	COPPER ACETOARSENITE	6.1		II	P5	A10.5.
		Copper acetylide					FORBIDDEN
		Copper amine azide					FORBIDDEN
	UN1586	COPPER ARSENITE	6.1		II	P5	A10.5.
★	UN2776	COPPER BASED PESTICIDES, LIQUID, FLAMMABLE, TOXIC, *flashpoint less than 23 degrees C*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3009	COPPER BASED PESTICIDES, LIQUID, TOXIC, FLAMMABLE, *flashpoint not less than 23 degrees C*	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3010	COPPER BASED PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P5 P5	A10.4. A10.4. A10.4.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN2775	COPPER BASED PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN2721	COPPER CHLORATE	5.1		II	P5, A1	A9.6.
	UN2802	COPPER CHLORIDE	8		III	P5	A12.3.
	UN1587	COPPER CYANIDE	6.1		II	P5	A10.5.
		Copper (II) arsenite, see COPPER ARSENITE					
		Copper (II) chlorate, see COPPER CHLORATE					
		Copper orthoarsenite, see COPPER ARSENITE					
		Copper selenate, see SELENATES *or* SELENITES					
		Copper selenites, see SELENATES *or* SELENITES					
		Copper tetramine nitrate					FORBIDDEN
	UN1363	COPRA	4.2		III		FORBIDDEN
	UN0065	CORD, DETONATING, *flexible*	1.1D		II	P4, 102, A69	A5.22.
	UN0289	CORD, DETONATING, *flexible*	1.4D		II	P5, A69	A5.22.
	UN0102	CORD, DETONATING *or* FUSE, DETONATING, *metal clad*	1.2D		II	P4, A69	A5.22.
	UN0290	CORD, DETONATING *or* FUSE, DETONATING, *metal clad*	1.1D		II	P4, A69	A5.22.
	UN0104	CORD, DETONATING, MILD EFFECT *or* FUSE, DETONATING, MILD EFFECT, *metal clad*	1.4D		II	P5, A69	A5.22.
	UN0066	CORD, IGNITER	1.4G		II	P5, A69	A5.23.
		Cordeau detonant fuse, see CORD, DETONATING, *or* CORD, DETONATING, *flexible*					
		Cordite, see POWDER, SMOKELESS, etc.					
		Corrosive battery fluid, see BATTERY FLUID, ACID *or* BATTERY FLUID, ALKALI					
★	UN1760	CORROSIVE LIQUID, N.O.S.	8		I II III	P3, A6, A7 P4 P5	A12.2. A12.2. A12.2.
★	UN3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8		I II III	P3, A6 P4 P5	A12.2. A12.2. A12.2.
★	UN3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	8		I II III	P3, A6 P4 P5	A12.2. A12.2. A12.2.
★	UN3266	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	8		I II III	P3, A6 P4 P5	A12.2. A12.2. A12.2.
★	UN3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8		I II III	P3, A6 P4 P5	A12.2. A12.2. A12.2.
★	UN3301	CORROSIVE LIQUID, SELF-HEATING, N.O.S.	8	4.2 4.2	I II	P3, A6 P4	A12.2. A12.2.
★	UN2920	CORROSIVE LIQUIDS, FLAMMABLE, N.O.S.	8	3 3	I II	P3, A6 P4	A12.2. A12.2.
★	UN3093	CORROSIVE LIQUIDS, OXIDIZING, N.O.S.	8	5.1 5.1	I II	P3, A6, A7 P4, A6, A7	A12.2. A12.2.
★	UN2922	CORROSIVE LIQUIDS, TOXIC N.O.S.	8	6.1 6.1 6.1	I II III	P3, A6, A7 P4 P5	A12.2. A12.2. A12.2.
★	UN3094	CORROSIVE LIQUIDS, WATER-REACTIVE, N.O.S.	8	4.3 4.3	I II	P3, A6, A7 P4, A6, A7	A12.2. A12.2.
★	UN3260	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN3262	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN3263	CORROSIVE SOLID, BASIC, ORGANIC, N.O.S	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN2921	CORROSIVE SOLIDS, FLAMMABLE, N.O.S.	8	4.1 4.1	I II	P3 P4	A12.3. A12.3.
★	UN1759	CORROSIVE SOLIDS, N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN3084	CORROSIVE SOLIDS, OXIDIZING, N.O.S.	8	5.1 5.1	I II	P5 P5	A12.3. A12.3.
★	UN3095	CORROSIVE SOLIDS, SELF-HEATING, N.O.S.	8	4.2 4.2	I II	P5 P5	A12.3. A12.3.
★	UN2923	CORROSIVE SOLIDS, TOXIC N.O.S.	8	6.1 6.1 6.1	I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN3096	CORROSIVE SOLIDS, WATER-REACTIVE, N.O.S.	8	4.3 4.3	I II	P3 P4	A12.3. A12.3.
		Cosmetics, corrosive, liquid, n.o.s., see CORROSIVE LIQUID, N.O.S.					
		Cosmetics, corrosive solid, n.o.s., see CORROSIVE SOLID, N.O.S.					
		Cosmetics, flammable, liquid, n.o.s., see PERFUMERY PRODUCTS *or* FLAMMABLE LIQUID, N.O.S.					
		Cosmetics, flammable, solid, n.o.s., see FLAMMABLE SOLID, ORGANIC, N.O.S. *or* FLAMMABLE SOLID, INORGANIC, N.O.S.					
		Cosmetics, n.o.s., in small inner packagings containing flammable aerosol and/or non-flammable aerosol and/or flammable liquid, n.o.s., see CONSUMER COMMODITY					
		Cosmetics, oxidizing material, liquid, n.o.s., see OXIDIZING LIQUID, N.O.S.					
		Cosmetics, oxidizing material, solid, n.o.s., see OXIDIZING SOLID, N.O.S.					
		Cotton seed, cut linters, hull fibers, pulp, waste and shavings, with animal or vegetable oil, see FABRICS VEGETABLE, N.O.S. *or* FIBERS, VEGETABLE, N.O.S.					
D	NA1365	COTTON	9				FORBIDDEN
	UN1364	COTTON WASTE, OILY	4.2		III	P5	A8.3.
	UN1365	COTTON, WET			III		FORBIDDEN
★	UN3024	COUMARIN DERIVATIVE PESTICIDES, LIQUID, FLAMMABLE, TOXIC, *flashpoint not less than 23 degrees C*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3026	COUMARIN DERIVATIVE PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P5 P5	A10.4. A10.4. A10.4.
★	UN3025	COUMARIN DERIVATIVE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, *flashpoint less than 23 degrees C*	6.1	3 3 3	I II III	P3 P5 P5	A10.4. A10.4. A10.4.
★	UN3027	COUMARIN DERIVATIVE PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Creosote, see TOXIC, LIQUID, ORGANIC, N.O.S.					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Creosote salts, see NAPHTHALENE, CRUDE *or* REFINED					
	UN2076	CRESOLS, LIQUID	6.1	8	II	P5	A10.4.
	UN3455	CRESOLS, SOLID	6.1	8	II	P5	A10.5.
	UN2022	CRESYLIC ACID	6.1	8	II	P5	A10.4.
		Crocidolite, see BLUE ASBESTOS					
	UN1143	CROTONALDEHYDE *or* CROTONALDEHYDE STABILIZED	6.1	3	I	P2, 2	A10.6.
		Crotonnaldehyde, unstabilized					FORBIDDEN
	UN3472	CROTONIC ACID, LIQUID	8		III	P5	A12.2
	UN2823	CROTONIC ACID, SOLID	8		III	P5	A12.3.
		Crotonic aldehyde, stabilized, see CROTONALDEHYDE					
	UN1144	CROTONYLENE	3		I	P3	A7.2.
		Crude napththa, see PETROLEUM DISTILLATES, N.O.S.					
		Cumeme, see ISOPROPYLBENZENE					
		Cupric cyanide, see COPPER CYANIDE					
	UN1761	CUPRIETHYLENEDIAMINE SOLUTION	8	6.1 6.1	II III	P4 P5	A12.2. A12.2.
	UN0070	CUTTERS, CABLE, EXPLOSIVE	1.4S		II	P5, A69	A5.17.
		Cyanide of calcium, see CALCIUM CYANIDE					
		Cyanide of potassium, see POTASSIUM CYANIDE SOLID *or* SOLUTION					
		Cyanide of sodium, see CYANIDES, INORGANIC, SOLID, N.O.S.					
		Cyanide or cyanide mixtures, dry, see CYANIDES, INORGANIC, SOLID N.O.S.					
★	UN1588	CYANIDES, INORGANIC, SOLID N.O.S.	6.1		I II III	P5, N74, N75 P5, N74, N75 P5, N74, N75	A10.5. A10.5. A10.5.
	UN1935	CYANIDE SOLUTIONS, N.O.S.	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
		Cyanides, organic, flammable , toxic, n.o.s., see NITRILES, FLAMMABLE, N.O.S.					
		Cyanides, organic, toxic, n.o.s., see NITRILES, TOXIC, LIQUID *or* SOLID N.O.S.					
		Cyanides, organic, toxic, flammable, n.o.s., see NITRILES, TOXIC, FLAMMABLE, N.O.S.					
		Cyanoacetonitrile, see MALONONITRILE					
	UN1026	CYANOGEN	2.3	2.1		P2, 2	A6.15.
	UN1889	CYANOGEN BROMIDE	6.1	8	I	P3, A6, A8	A10.5.
	UN1589	CYANOGEN CHLORIDE, STABILIZED	2.3	8		P1, 1	A6.15.
		Cyanogen Chloride, unstabilized					FORBIDDEN
	UN2670	CYANURIC CHLORIDE	8		II	P5	A12.3.
		Cyanuric triazide					FORBIDDEN
	UN2601	CYCLOBUTANE	2.1			P4	A6.3., A6.4.
	UN2744	CYCLOBUTYL CHLOROFORMATE	6.1	3, 8	II	P4	A10.4.
	UN2518	1,5,9-CYCLODODECATRIENE	6.1		III	P5	A10.4.
	UN2241	CYCLOHEPTANE	3		II	P5	A7.2.
		1,3,5-Cycloheptatriene, see CYCLOHEPTATRIENE					
	UN2603	CYCLOHEPTATRIENE	3	6.1	II	P5	A7.2.
	UN2242	CYCLOHEPTENE	3		II	P5	A7.2.
		1,4-Cyclohexadienedione, see BENZOQUINONE					
	UN1145	CYCLOHEXANE	3		II	P5	A7.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Cyclohexanethiol, see CYCLOHEXYL MERCAPTAN					
	UN1915	CYCLOHEXANONE	3		III	P5	A7.2.
	UN2256	CYCLOHEXENE	3		II	P5	A7.2.
	UN1762	CYCLOHEXENYLTRICHLOROSILANE	8		II	P4, A7, N34	A12.2.
	UN2243	CYCLOHEXYL ACETATE	3		III	P5	A7.2.
	UN2488	CYCLOHEXYL ISOCYANATE	6.1	3	I	P2, 2	A10.6.
	UN3054	CYCLOHEXYL MERCAPTAN	3		III	P5	A7.2.
	UN2357	CYCLOHEXYLAMINE	8	3	II	P5	A12.2.
	UN1763	CYCLOHEXYLTRICHLOROSILANE	8		II	P4, A7, N34	A12.2.
	UN0483	CYCLONITE, DESENSITIZED	1.1D		II	P4	A5.6.
		CYCLONITE AND CYCLOTETRAMETHYLENETETRANITRA -MINE MIXTURES, WETTED *or* DESENSITIZED *see* RDX AND HMX MIXTURES, WETTED *or* DESENSITIZED *etc.*					
		CYCLONITE AND HMX MIXTURES, WETTED *or* DESENSITIZED *see* RDX AND HMX MIXTURES WETTED *or* DESENSITIZED *etc.*					
		CYCLONITE *and* OCTOGEN MIXTURES, WETTED *or* DESENSITIZED *see* RDX AND HMX MIXTURES, WETTED *or* DESENSITIZED *etc.*					
		CYCLONITE, *see* CYCLOTRIMETHYLENETRINITRAMINE, *etc.*					
		CYCLOOCTADIENE PHOSPHINES, *see* 9-PHOSPHABICYCLONONANES					
	UN2520	CYCLOOCTADIENES	3		III	P5	A7.2.
	UN2358	CYCLOOCTATETRAENE	3		II	P5	A7.2.
	UN1146	CYCLOPENTANE	3		II	P5	A7.2.
		Cyclopentane, methyl, see METHYLCYCLOPENTANE					
	UN2244	CYCLOPENTANOL	3		III	P5	A7.2.
	UN2245	CYCLOPENTANONE	3		III	P5	A7.2.
	UN2246	CYCLOPENTENE	3		II	P5	A7.2.
	UN1027	CYCLOPROPANE	2.1			P4	A6.3., A6.4.
		Cyclotetramrtylene tetranitramine (dry or unphlegmatized) (HMX)					FORBIDDEN
	UN0484	CYCLOTETRAMETHYLENE TETRANITRAMINE, DESENSITIZED, *or* OCTOGEN, DESENSITIZED *or* HMX DESENSITIZED	1.1D		II	P4	A5.6.
	UN0226	CYCLOTETRAMETHYLENETETRANITRA MINE, WETTED, *or* HMX, WETTED *or* OCTOGEN, WETTED *with not less than 15% water, by mass*	1.1D		II	P4	A5.6.
		CYCLOTRIMETHYLENETRINITRAMINE AND CYCLOTETRAMETHYLENETETRANITRA -MINE MIXTURES, WETTED *or* DESENSITIZED *see* RDX AND HMX MIXTURES, WETTED *or* DESENSITIZED *etc*					
		CYCLOTRIMETHYLENETRINITRAMINE AND HMX MIXTURES, WETTED *or* DESENSITIZED *see* RDX AND HMX MIXTURES, WETTED *or* DESENSITIZED *etc*					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		CYCLOTRIMETHYLENENITRAMINE AND OCTOGEN, MIXTURES, WETTED *or* DESENSITIZED *see* RDX AND HMX MIXTURES, WETTED *or* DESENSITIZED *etc*					
	UN0391	CYCLONITE AND CYCLOTETRAMETHYLENETRANITRAMINE MIXTURE, DESENSITIZED *with not less than 15% water by mass*	1.1D		II	P4	A5.6.
	UN0391	CYCLONITE AND CYCLOTETRAMETHYLENETRANITRAMINE MIXTURE, DESENSITIZED *with 10% or more phlegmatizer, by mass*	1.1D		II	P4	A5.6.
	UN0072	CYCLONITE, WETTED *with not less than 15% water by mass*	1.1D		II	P4	A5.6.
	UN2940	CYCLOOCTADIENE PHOSPHINES	4.2		II	P5, A19	A8.3.
		Cyclotetramethylenetetranitramine (dry)					FORBIDDEN
	UN0391	CYCLOTRIMETHYLENETRINITRAMINE AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, WETTED *with not less than 15% water by mass or* HEXOGEN AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, WETTED *with not less than 15% water by mass or* RDX AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, WETTED *with not less than 15% water by mass or* CYCLONITE AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, WETTED *with not less than 15% water by mass*	1.1D		II	P4	A5.6.
	UN0391	CYCLOTRIMETHYLENETRINITRAMINE AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, DESENSITIZED *with not less than 10% phlegmatizer by mass or* HEXOGEN AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, DESENSITIZED *with not less than 10% phlegmatizer by mass or* RDX AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, DESENSITIZED *with not less than 10% phlegmatizer by mass or* CYCLONITE AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, DESENSITIZED *with not less than 10% phlegmatizer by mass or*	1.1D		II	P4	A5.6.
	UN0483	CYCLOTRIMETHYLENETRINITRAMINE, DESENSITIZED, *or* CYCLONITE, DESENSITIZED, *or* HEXOGEN, DESENSITIZED, *or* RDX, DESENSITIZED	1.1D		II	P4	A5.6.
	UN0072	CYCLOTRIMETHYLENETRINITRAMINE, WETTED *or* CYCLONITE, WETTED *or* HEXOGEN, WETTED *or* RDX, WETTED *with not less than 15% water by mass*	1.1D		II	P4	A5.6.
	UN2046	CYMENES	3		III	P5	A7.2.
		Cymol, see CYMEMES					
	UN3363	DANGEROUS GOODS IN APPARATUS *or* DANGEROUS GOODS IN MACHINERY	9			P5	A13.13.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Dead oil, see TARS, LIQUID					
		Deanol, see 2-DIMETHYLAMINOETHANOL					
	UN1868	DECABORANE	4.1	6.1	II	P5, A19, A20	A8.3.
	UN1147	DECAHYDRONAPHTHALENE	3		III	P5	A7.2.
		Decalin, see DECAHYDRONAPHTHALENE					
	UN2247	n-DECANE	3		III	P5	A7.2.
	UN0132	DEFLAGRATING METAL SALTS OF AROMATIC NITRODERIVATIVES, N.O.S.	1.3C		II	P4	A5.9.
		De-icing fluid, see FLAMMABLE LIQUID, N.O.S.					
		Delay electric igniter, see IGNITERS					
D	NA1987	DENATURED ALCOHOL	3		II III	P4 P5	A7.2. A7.2.
		Depth Charges, see CHARGES DEPTH					
	UN3379	DESENSITIZED EXPLOSIVE, LIQUID, N.O.S.	3		I		FORBIDDEN
	UN3380	DESENSITIZED EXPLOSIVE, SOLID, N.O.S.	4.1		I		FORBIDDEN
		Detonating relays, see DETONATORS NON-ELECTRIC *or* DETONATORS ASSEMBLIES NON-ELECTRIC					
	UN0360	DETONATOR ASSEMBLIES, NON-ELECTRIC *for blasting*	1.1B		II	P4, A69	A5.14.
	UN0361	DETONATOR ASSEMBLIES, NON-ELECTRIC *for blasting*	1.4B		II	P5, 103, A69	A5.14.
	UN0500	DETONATOR ASSEMBLIES, NON-ELECTRIC *for blasting*	1.4S		II	P5, 347	A5.14.
	UN0030	DETONATORS, ELECTRIC, *for blasting*	1.1B		II	P4, A69	A5.13.
	UN0255	DETONATORS, ELECTRIC, *for blasting*	1.4B		II	P5, 103, A69	A5.13.
	UN0456	DETONATORS, ELECTRIC, *for blasting*	1.4S		II	P5, 347, A69	A5.13.
	UN0073	DETONATORS FOR AMMUNITION	1.1B		II	P4	A5.16.
	UN0364	DETONATORS FOR AMMUNTION	1.2B		II	P4	A5.16.
	UN0365	DETONATORS FOR AMMUNITION	1.4B		II	P5, 103	A5.16.
	UN0366	DETONATORS FOR AMMUNITION	1.4S		II	P5, 347, A69	A5.16.
	UN0029	DETONATORS, NON-ELECTRIC, *for blasting*	1.1B		II	P4, A69	A5.14.
	UN0267	DETONATORS, NON-ELECTRIC, *for blasting*	1.4B		II	P5, 103, A69	A5.14.
	UN0455	DETONATORS, NON-ELECTRIC, *for blasting*	1.4S		II	P5, 347, A69	A5.14.
	UN1957	DEUTERIUM, COMPRESSED	2.1			P4, N89	A6.3., A6.5.
	UN3150	DEVICES, SMALL, HYDROCARBON GAS POWERED *or* HYDROCARBON GAS REFILLS FOR SMALL DEVICES *with release device*	2.1			P5	A6.3., A6.4.
	UN2841	DI-N-AMYLAMINE	3	6.1	III	P5	A7.2.
		p-Diazidobenzene					FORBIDDEN
		1,2-Diazidoethane					FORBIDDEN
		Diazoaminotetrazole (dry)					FORBIDDEN
		Diazodinitrophenol (dry)					FORBIDDEN
		1,1'-Diazoaminonaphthalene					FORBIDDEN
		Di-2,4-Dichlorobenzoyl peroxide, with more than 75% with water					FORBIDDEN
	UN2372	1,2-DI-(DIMETHYLAMINO) ETHANE	3		II	P5	A7.2.
		Di-2-ethylhexyl phosphoric acid, see DIISOOCTYL ACID PHOSPHATE					
		Di-(naphthoyl) peroxide					FORBIDDEN
		a,a-Di-(nitroxy) methyether					FORBIDDEN
		Di-(beta-nitroxyethyl) ammonium nitrate					FORBIDDEN

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1148	DIACETONE ALCOHOL	3		II III	P5 P5	A7.2. A7.2.
		Diacetone alcohol peroxides, with more than 57 percent in solution with more than 9 percent hydrogen peroxide, less than 26 percent diacetone alcohol and less than 9 percent water; total active oxygen content more than 9 percent by mass					FORBIDDEN
		Diacetyl, see BUTANEDIONE					
		Diacetyl peroxide, solid, or with more than 25 percent in solution					FORBIDDEN
		Diagnostic specimens, see BIOLOGICAL SUBSTANCES, CATEGORY B					
	UN2359	DIALLYLAMINE	3	6.1, 8	II	P4	A7.2.
	UN2360	DIALLYL ETHER	3	6.1	II	P4, N12	A7.2.
		m-Diaminobenzene, see PHENYLENEDIAMINES					
	UN2651	4,4'-DIAMINODIPHENYL METHANE	6.1		III	P5	A10.5.
		1,2-Diaminoethane, see PHENYLENEDIAMINES					
		Diaminopropylamine, see 3,3'- IMINODIPROPYLAMINE					
		Di-(aminopropyl)-piperazine, see AMINES, LIQUID, CORROSIVE, N.O.S.					
	UN0074	DIAZODINITROPHENOL, WETTED *with not less than 40% water, or mixture of alcohol and water, by mass*	1.1A		II	P4, 111, 117	A5.4.
		Diazodiphenylmethane					FORBIDDEN
		2-Diazo-1-naphthal sulphonic acid ester mixture type d, see SELF-REACTIVE SOLID TYPE D					
		2-Diazo-1-naphthol-5-sulphonyl chloride					FORBIDDEN
		2-Diazo-1-naphthol-4-sulphonyl chloride					FORBIDDEN
		Diazonium nitrates (dry)					FORBIDDEN
		Diazonium perchlorates (dry)					FORBIDDEN
		1,3-Diazopropane					FORBIDDEN
		Dibenzoyl peroxide, with more than 51% when with less than or equal 48% inert solid					FORBIDDEN
		Dibenzoyl peroxide, with more than 77% and with less than 94% when with more or equal 6% water					FORBIDDEN
	UN2434	DIBENZYLDICHLOROSILANE	8		II	P5	A12.2.
		Dibenzyl peroxydicarbonate, with more than 87 percent with water					FORBIDDEN
		Dibenzyl perxoxydicarbonate, not more than 87% when with 13% or more water					FORBIDDEN
	UN1911	DIBORANE	2.3	2.1		P1, 1, N89	A6.5.
D	NA1911	DIBORANE MIXTURES	2.1				FORBIDDEN
		Dibromoacetylene					FORBIDDEN
	UN2648	1,2-DIBROMOBUTAN-3-ONE	6.1		II	P5	A10.4.
		1,2-Dibromo-3-chloropane, see DIBROMOCHLOROPROPANES					
	UN2872	DIBROMOCHLOROPROPANE	6.1		II III	P5 P5	A10.4. A10.4.
	UN1941	DIBROMODIFLUOROMETHANE, R12B2	9		III	P5	A13.2.
		1,2-Dibromoethane, see ETHYLENE DIBROMIDE					
	UN2664	DIBROMOMETHANE	6.1		III	P5	A10.4.
		2,5-Dibutoxy-4 (4-morpholinyl)-benzenediazonium, tetrachlorozincote (2:1), see SELF-REACTIVE SOLID TYPE E					
	UN2248	DI-N-BUTYLAMINE	8	3	II	P5	
		2-Dibutylaminoethanol, see DIBUTYLAMINOETHANOL					

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		N,N-Di-n-butylaminoethanol, see DIBUTYLAMINOETHANOL					
	UN2873	DIBUTYLAMINOETHANOL	6.1		III	P5	A10.4.
	UN1149	DIBUTYL ETHERS	3		III	P5	A7.2.
		2,2-Di-(tert-butylperoxy) butane, more than 55% in solution					FORBIDDEN
		Di-(tert-butylperoxy) phthalate, more than 55% in solution					FORBIDDEN
		2,2-Di-(4,4-tert-butylperoxycyclohexyl) propane, with more than 42 percent with inert solid					FORBIDDEN
		1,1-Di-(tert-butylperoxy) cyclohexane, more than 80%					FORBIDDEN
		Di-n-butyl peroxydicarbonate, more than 52% in solution					FORBIDDEN
		1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclo hexane, more than 90%					FORBIDDEN
		N,N'-Dichlorazodicarbonamidine (salts of) (dry)					FORBIDDEN
D	NA9264	3,5 DICHLORO-2,4,6 TRIFLUOROPYRIDINE	6.1		I	P2, 2	A10.6.
	UN1764	DICHLOROACETIC ACID	8		II	P5, A3, A6, A7, N34	A12.2.
	UN2649	1,3-DICHLOROACETONE	6.1		II	P5	A10.5.
	UN1765	DICHLOROACETYL CHLORIDE	8		II	P5, A3, A6, A7, N34	A12.2.
		Dichloroacetylene					FORBIDDEN
+	UN1590	DICHLOROANILINES, LIQUID	6.1		II	P5	A10.4.
	UN3442	DICHLOROANILINES, SOLID	6.1		II	P5	A10.5.
+	UN1591	o-DICHLOROBENZENE	6.1		III	P5	A10.4.
		Di-4-chlorobenzoyl peroxide, less than or equal to 77%, when with greater or equal to 23% water					FORBIDDEN
	UN1916	2,2'-DICHLORODIETHYL ETHER	6.1	3	II	P5, N33, N34	A10.4.
	UN1028	DICHLORODIFLUOROMETHANE *or* REFRIGERANT GAS R12	2.2			P5	A6.3.. A6.4.
	UN2602	DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE *or* REFRIGERANT GAS R500 *with approximately 74% dichlorodifluoromethane*	2.2			P5	A6.3.. A6.4.
		Dichlorodifluoromethane and ethylene oxide mixtures, see ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE					
	UN2249	DICHLORODIMETHYL ETHER, SYMMETRICAL	6.l	3	I	P3	A10.4.
	UN2362	1,1-DICHLOROETHANE	3		II	P5	A7.2.
		1,2-Dichloroethane, see ETHYLENE DICHLORIDE					
	UN1150	1,2-DICHLOROETHYLENE	3		II	P5	A7.2.
		Di(2-chlorethyl) ether, see 2-2'-DICHLORODIETHYL ETHER					
		Dichloroethyl sulphide					FORBIDDEN
	UN1029	DICHLOROFLUOROMETHANE *or* REFRIGERANT GAS R21	2.2			P5	A6.3.. A6.4.
		Alpha-Dichlorohydrin, see 1,3-DICHLOROPROPANOL-2					
	UN2465	DICHLOROISOCYANURIC ACID, DRY *or* DICHLOROISOCYANURIC ACID SALTS	5.1		II	P5	A9.6.
	UN2490	DICHLOROISOPROPYL ETHER	6.1		II	P5	A10.4.

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1593	DICHLOROMETHANE	6.1		III	P5, N36	A10.4.
	UN2650	1,1-DICHLORO-1-NITROETHANE	6.1		II	P5	A10.4.
	UN1152	DICHLOROPENTANES	3		III	P5	A7.2.
		Dichlorophenols, see CHLOROPHENOLS, SOLID *or* CHLOROPHENOLS, LIQUID					
	UN2250	DICHLOROPHENYL ISOCYANATES	6.1		II	P5	A10.5.
	UN1766	DICHLOROPHENYLTRICHLOROSILANE	8		II	P4, A7, N34	A12.2.
	UN1279	1,2-DICHLOROPROPANE	3		II	P5, N36	A12.2.
	UN2750	1,3-DICHLOROPROPANOL-2	6.1		II	P5	A10.4.
		1,3-Dichloro-2-propanone, see, 1,3-DICHLOROACETONE					
		Dichloropropene and propylene dichloride mixture, see 1,2-DICHLOROPROPANE					
	UN2047	DICHLOROPROPENES	3		II III	P5 P5	A7.2. A7.2.
	UN2189	DICHLOROSILANE	2.3	2.1, 8		P2, 2	A6.4.
	UN1958	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE *or* REFRIGERANT GAS R114	2.2			P5	A6.3.. A6.4.
		Dichlorovinylchloroarsine					FORBIDDEN
		Dicycloheptadiene, see BICYCLO[2,2,1] HEPTA-2,5-DIENE,STABILIZED					
		1,4-Dicyanobutane, see ADIPONITRILE					
		DICYCLOHEPTADIENE, see 2,5-NORBORNADIENE STABILIZED *or* BICYCLO [2,2,1] HEPTA-2-5-DIENE, STABILIZED					
	UN2565	DICYCLOHEXYLAMINE	8		III	P5	A12.2.
		Dicyclohexylaminenitrite, see DICYCLOHEXYLAMMONIUM NITRITE					
	UN2687	DICYCLOHEXYLAMMONIUM NITRITE	4.1		III	P5	A8.3.
		Dicyclohexyl perxoxydicarbonate more than 91%					FORBIDDEN
	UN2048	DICYCLOPENTADIENE	3		III	P5	A7.2.
		2,2-Di-(4,4-di-tert-butylperoxycyclohexyl) propane, more than 42% with inert solid					FORBIDDEN
		Di-2,4-dichlorobenzoyl peroxide, less than 77%, when with 23% or more water					FORBIDDEN
	UN1465	DIDYMIUM NITRATE	5.1		III	P5, A1	A9.6.
D	NA1993	DIESEL FUEL	3		III	P5	A7.2.
	UN1202	DIESEL FUEL *or* GAS OIL	3		III	P5	A7.2.
		Diethanol nitrosamine dinitrate (dry)					FORBIDDEN
		1,1-Diethoxyethane, see ACETAL					
		1,2-Diethoxyethane, see ETHYLENE GLYCOL DIETHYL ETHER					
	UN2373	DIETHOXYMETHANE	3		II	P5	A7.2.
		2,5-Diethoxy-4-morpholinobenzenediazonium zinc chloride, see SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED					
		2,5-Diethoxy-4-(4-morpholinyl)-benzenediazonium sulfate, see SELF-REACTIVE SOLID TYPE D					
	UN2374	3,3-DIETHOXYPROPENE	3		II	P5	A7.2.
		Diethyl acetal, see ACETAL					
	UN2366	DIETHYL CARBONATE	3		III	P5	A7.2.
		Diethyl cellosolve, see ETHYLENE GLYCOL DIETHYL ETHER					
	UN1155	DIETHYL ETHER *or* ETHYL ETHER	3		I	P3	A7.2.
	UN1156	DIETHYL KETONE	3		II	P5	A7.2.
		Diethyl peroxydicarbonate, more than 27% in solution					FORBIDDEN
	UN1594	DIETHYL SULPHATE	6.1		II	P5	A10.4.
	UN2375	DIETHYL SULFIDE	3		II	P5	A7.2.

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1154	DIETHYLAMINE	3	8	II	P4, A3, N34	A7.2.
		Diethylaminoethanol, see 2-DIETHYLAMINOETHANOL					
	UN2686	2-DIETHYLAMINOETHANOL	8	3	II	P5	A12.2.
	UN2684	3-DIETHYLAMINOPROPYLAMINE	3	8	III	P5	A7.2.
+	UN2432	N,N-DIETHYLANILINE	6.1		III	P5	A10.4.
	UN2049	DIETHYLBENZENE	3		III	P5	A7.2.
	UN1767	DIETHYLDICHLOROSILANE	8	3	II	P4, A7, N34	A12.2.
		Diethyldimethyl lead mixture, see MOTOR FUEL ANTI-KNOCK MIXTURE					
		Diethylenediamine, see PIPERAZINE					
	UN0075	DIETHYLENEGLYCOL DINITRATE, DESENSITIZED *with not less than 25% non-volatile water-insoluble phlegmatizer, by mass*	1.1D		II		FORBIDDEN
		Diethylene dinitrate, desensitized, with less than 25% phlegmatizer					FORBIDDEN
		Diethyleneglycol dinitrate (dry)					FORBIDDEN
		Diethylene oxide, see DIOXANE					
	UN2079	DIETHYLENETRIAMINE	8		II	P5	A12.2.
		N,N-Diethylethanolamine, see 2-DIETHYLAMINOETHANOL					
	UN2685	N,N-DIETHYLETHYLENEDIAMINE	8	3	II	P5	A12.2.
		Diethylgold bromide					FORBIDDEN
		Di-(2-ethylhexyl) phosphoric acid, see DIISOOCTYL ACID PHOSPHATE					
	UN2751	DIETHYLTHIOPHOSPHORYL CHLORIDE	8		II	P5	A12.3.
		2,4-Difluorochloroethane, see 1-CHLORO-1,1-DIFLUOROETHANE					
		Difluorochloroethane, see FLUOROANILINES					
	UN1366	DIETHYLZINC	4.2	4.3	I	P3	A8.5.
		Difluorochloroethanes, see 1-CHLORO-1,1-DIFLUOROETHANES					
	UN1030	1,1- DIFLUOROETHANE *or* REFRIGERANT GAS R152A	2.1			P4	A6.3.. A6.4.
	UN1959	1,1-DIFLUOROETHYLENE *or* REFRIGERANT GAS R1132A	2.1			P4	A6.3.. A6.4.
	UN3252	DIFLUOROMETHANE *or* REFRIGERANT GAS R32	2.1			P4	A6.3.. A6.4.
		Difluoromethane, pentafluoromethane and 1,1,1,2 tetrafluoroethane azeotropic mixture with approximately 10% difluoromethane and 70% pentafluoroethane, see REFRIGERANT GAS R 407B					
		Difluoromethane, pentafluoromethane and 1,1,1,2 tetrafluoroethane azeotropic mixture with approximately 20% difluoromethane and 40% pentafluoroethane, see REFRIGERANT GAS R 407A					
		Difluoromethane, pentafluoromethane and 1,1,1,2 tetrafluoroethane azeotropic mixture with approximately 23% difluoromethane and 25% pentafluoroethane, see REFRIGERANT GAS R 407C					
	UN1768	DIFLUOROPHOSPHORIC ACID, ANHYDROUS	8		II	P5, A6, A7, N5, N34	A12.2.
		2,2-Dihydroperoxypropane, not more than 27% when with 73% or more inert solid					FORBIDDEN
	UN2376	2,3-DIHYDROPYRAN	3		II	P5	A7.2.
		1,8-Dihydroxy-2,4,5,7-tetranitroanthraquinone (chrysamminic acid)					FORBIDDEN
		Di-(1-hydroxytetrazole) (dry)					FORBIDDEN
		Diiodoacetyline					FORBIDDEN

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1157	DIISOBUTYL KETONE	3		III	P5	A7.2.
		Diisobutyryl peroxide, more than 32% and less than 52%, when with 48% or more diluent type A or B					FORBIDDEN
	UN2361	DIISOBUTYLAMINE	3	8	III	P5	A7.2.
		Alpha-Diisobutylene or beta-Diisobutylene, see DIISOBUTYLENE, ISOMERIC COMPOUND					
	UN2050	DIISOBUTYLENE, ISOMERIC COMPOUNDS	3		II	P5	A7.2.
	UN1902	DIISOOCTYL ACID PHOSPHATE	8		III	P5	A12.2.
	UN1159	DIISOPROPYL ETHER	3		II	P5	A7.2.
		Diisopropyl oxide, see DIISOPROPYL ETHER					
		Diisopropyl peroxydicarbonate, more than 52%					FORBIDDEN
	UN1158	DIISOPROPYLAMINE	3	8	II	P4	A7.2.
		Diispopropylbenzene hydroperoxide, with more than 72 percent solution					FORBIDDEN
	UN2521	DIKETENE, STABILIZED	6.1	3	I	P2, 2	A10.6.
		Diketene, Unstabilized					FORBIDDEN
	UN2377	1,1-DIMETHOXYETHANE	3		II	P3	A7.2.
	UN2252	1,2-DIMETHOXYETHANE	3		II	P3	A7.2.
		Dimethoxymethane, see METHYLAL					
		Dimethosystrychnine, see BRUCINE					
	UN1161	DIMETHYL CARBONATE	3		II	P5	A7.2.
		Dimethyl chlorothiophosphate, see DIMETHYL THIOPHOSPHORYL CHLORIDE					
	UN2381	DIMETHYL DISULFIDE	3		II	P5	A7.2.
		Dimethylethanolamine, see DIMETHYLAMINOETHANOL					
	UN1033	DIMETHYL ETHER	2.1			P4	A6.3., A6.4.
	UN2266	DIMETHYL-N-PROPYLAMINE	3	8	II	P5	A7.2.
	UN1595	DIMETHYL SULPHATE	6.1	8	I	P2, 2	A10.6.
	UN1164	DIMETHYL SULPHIDE	3		II	P5	A7.2.
	UN2267	DIMETHYL THIOPHOSPHORYL CHLORIDE	6.1	8	II	P5	A10.4.
		Di-(1-naphthoy) peroxide					FORBIDDEN
	UN1032	DIMETHYLAMINE, ANHYDROUS	2.1			P4, N87	A6.4.
	UN1160	DIMETHYLAMINE SOLUTION	3	8	II	P4	A7.2.
	UN2378	2-DIMETHYLAMINOACETONITRILE	3	6.1	II	P4	A7.2.
		4-(Dimethylamino)-benzenediazonium trichlozincate (-1), see SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED					
		4-dimethylamino-6-(2-dimethylaminoethoxy) toluene-2-diazonium zinc chloride; see SELF-RELATIVE SOLID TYPE D, TEMPERATURE CONTROLLED					
	UN2051	2-DIMETHYLAMINOETHANOL	8	3	II	P5	A12.2.
	UN3302	2-DIMETHYLAMINOETHYL ACRYLATE	6.1		II	P5	A10.4.
	UN2522	2-DIMETHYLAMINOETHYL METHACRYLATE	6.1		II	P5	A10.4.
	UN2253	N,N-DIMETHYLANILINE	6.1		II	P5	A10.4.
		Dimethylarsenic acid, see CACODYLIC ACID					
		Dimethyl benzene, see XYLENES					
		Di-(2-methylbenzol) peroxide, not more than 87% when with 13% or more water					FORBIDDEN
		N,N-Dimethylbenzylamine, see BENZYLDIMETHYLAMINE					
	UN2457	2,3-DIMETHYLBUTANE	3		II	P5	A7.2.

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2379	1,3-DIMETHYLBUTYLAMINE	3	8	II	P5	A7.2.
	UN2262	DIMETHYLCARBAMOYL CHLORIDE	8		II	P5	A12.2.
	UN2263	DIMETHYLCYCLOHEXANES	3		II	P5	A7.2.
	UN2264	N,N-DIMETHYLCYCLOHEXYLAMINE	8	3	II	P5	A12.2.
		2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane, more than 82%					FORBIDDEN
		2,5-Dimethyl-2,5-di(tert-butylperoxy)hexyne-3more than 86%					FORBIDDEN
	UN1162	DIMETHYLDICHLOROSILANE	3	8	II	P5	A7.2.
	UN2380	DIMETHYLDIETHOXYSILANE	3		II	P5	A7.2.
		2,5-Dimethyl-2,5-dihydroperoxy hexane, more than 82% with water					FORBIDDEN
		2,5-Dimethyl-1,4-dioxane, see DIMETHYLDIOXANES					
		4,4-Dimethyldioxane-1,3, see DIMETHYLOXANES					
	UN2707	DIMETHYLDIOXANES	3		II III	P5 P5	A7.2. A7.2.
	UN2265	N,N-DIMETHYFORMAMIDE	3		III	P5	A7.2.
		Dimethyhexane dihyproperoxide (dry)					FORBIDDEN
		Dimethylhexane dihydroperoxide, more than 82% with water					FORBIDDEN
		1,1-Dimethylhydrazine, see DIMETHYLHYDRAZINE, UNSYMMETRICAL					
	UN2382	DIMETHYLHYDRAZINE, SYMMETRICAL	6.1	3	I	P2, 2, A7	A10.6.
	UN1163	DIMETHYLHYDRAZINE, UNSYMMETRICAL	6.1	3, 8	I	P2, 2	A10.6.
		N,N-Dimethyl-4-nitroaniline, see p-NITROSODIMETHYLAMINE					
	UN2044	2,2-DIMETHYLPROPANE	2.1			P4	A6.3., A6.4.
	UN1370	DIMETHYLZINC	4.2	4.3	I	P3	A8.5.
	UN0489	DINGU *or* DINITROGLYCOLURIL	1.1D		II	P4	A5.7.
	UN1598	DINITRO-O-CRESOL, SOLID *or* DINITRO-O-CRESOL, SOLUTION	6.1		II	P5	A10.4., A10.5.
		1,3-Dinitro-5,5-dimethylhydantoin					FORBIDDEN
		Dinitro-7,8-dimethylglycoluril (dry)					FORBIDDEN
		1,3-Dinitro-4,5-dinitrosobenzene					FORBIDDEN
		1,4-Dinitro-1,1,4,4-tetramethylolbutanetetranitrate (dry)					FORBIDDEN
		2,4-Dinitro-1,3,5-trimethylbenzene					FORBIDDEN
		1,2-Dinitroethane					FORBIDDEN
		1,1-Dinitroethane (dry)					FORBIDDEN
	UN1596	DINITROANILINES	6.1		II	P5	A10.5.
	UN1597	DINITROBENZENES, LIQUID	6.1		II III	P5 P5	A10.4 A10.4
	UN3443	DINITROBENZENES, SOLID	6.1		II	P5	A10.6
		Dinitrocholorobenzenes, see CHLORODINITROBENZENE LIQUID *or* SOLID					
	UN1067	DINITROGEN TETROXIDE	2.3	5.1, 8			FORBIDDEN
	UN0489	DINITROGLYCOLURIL *or* DINGU	1.1D		II	P4	A5.7.
		Dinitromethane					FORBIDDEN
	UN0076	DINITROPHENOL, *dry or wetted with less than 15% water, by mass*	1.1D	6.1	II	P4	A5.6.
	UN1599	DINITROPHENOL SOLUTIONS	6.1		II III	P5 P5	A10.4. A10.4.
	UN1320	DINITROPHENOL, WETTED *with not less than 15% water, by mass*	4.1	6.1	I	P4, 23, A8, A19, A20, N41	A8.3.
	UN0077	DINITROPHENOLATES, *alkali metals, dry or wetted with less than 15% water, by mass*	1.3C	6.1	II	P4	A5.9.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1321	DINITROPHENOLATES, WETTED *with not less than 15% water, by mass*	4.1	6.1	I	P4, 23, A8, A19, A20,N41	A8.3.
		Dinitropropylene glycol					FORBIDDEN
	UN0078	DINITRORESORCINOL, *dry or wetted with less than 15% water, by mass*	1.1D		II	P4	A5.6.
		2,4-Dinitroresorcinol (heavy metal salts of) (dry)					FORBIDDEN
		4,6-Dinitroresorcinol (heavy metal salts of) (dry)					FORBIDDEN
	UN1322	DINITRORESORCINOL, WETTED *with not less than 15% water, by mass*	4.1		I	P4, 23, A8, A19, A20, N41	A8.3.
		3,5-Dinitrosalicylic acid (lead salt) (dry)					FORBIDDEN
	UN0406	DINITROSOBENZENE	1.3C		II	P4	A5.9.
		Dinitrosobenzylamidine and salts of (dry)					FORBIDDEN
		N,N'-Dinitroso-N,N'-dimethyl terephthalamide, 72% or less as a paste, see SELF-REACTIVE SOLID TYPE C					
		N,N'-Dinitrosopentamethylene tetramine, 82% or less with phlegmatizer, see SELF-REACTIVE SOLID TYPE C					
		2,2-Dinitrostilbene					FORBIDDEN
		1,4-Dinitro-1,1,4,4-tetramethylolbutane tetranitrate (dry)					FORBIDDEN
	UN2038	DINITROTOLUENES, LIQUID	6.1		II	P5	A10.4.
	UN1600	DINITROTOLUENES, MOLTEN					FORBIDDEN
	UN3454	DINITROTOLUENES, SOLID	6.1		II	P5	A10.5.
		2,4-Dinitro-1,3,5-trimethylbenzene					FORBIDDEN
		Di-(beta-nitroxyethyl)ammonium nitrate					FORBIDDEN
		a,a-Di-(nitroxy) methylether					FORBIDDEN
		1,9-Dinitroxy pentamethylene-2,4,6,8-tetramine (dry)					FORBIDDEN
	UN1165	DIOXANE	3		II	P5	A7.2.
	UN1166	DIOXOLANE	3		II	P5	A7.2.
	UN2052	DIPENTENE	3		III	P5	A7.2.
		Di-(2-phenoxyethyl) peroxydicarbonate, more than 85%					FORBIDDEN
	UN1698	DIPHENYLAMINE CHLOROARSINE	6.1		I	P3	A10.4.
	UN1699	DIPHENYLCHLOROARSINE, LIQUID	6.1		I	P3, A8, N33, N34	A10.4.
	UN3450	DIPHENYLCHLOROARSINE, SOLID	6.1		I	P3, A8, N33, N34	A10.5.
	UN1769	DIPHENYLDICHLOROSILANE	8		II	P4, A7, N34	A12.2.
	UN1770	DIPHENYLMETHYL BROMIDE	8		II	P5	A12.3.
		Diphenyloxide-4,4'-disulphonyl hydrazide, see SELF-REACTIVE SOLID TYPE D					
	UN0401	DIPICRYL SULPHIDE, *dry or wetted with less than 10% water, by mass*	1.1D		II	P4	A5.6.
	UN2852	DIPICRYL SULPHIDE, WETTED *with not less than 10% water, by mass*	4.1		I	P4, A2, N41	A8.3.
	UN0079	DIPICRYLAMINE *or* HEXANITRODIPHENYLAMINE	1.1D		II	P4	A5.6.
		Dipropionyl peroxide, with more than 28 percent in solution					FORBIDDEN
	UN2384	DI-N-PROPYL ETHER	3		II	P5	A7.2.
	UN2710	DIPROPYL KETONE	3		III	P5	A7.2.
	UN2383	DIPROPYLAMINE	3	8	II	P4	A7.2.
		4-Dipropylaminobenzenediazonium zinc chloride, see SELF-REACTIVE SOLID TYPE D					
		Dipropylene triamine, see 3,3'-IMINODIPROPYLAMINE					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN1903	DISINFECTANTS, LIQUID, CORROSIVE, N.O.S	8		I II III	P3, A6, A7 P5 P5	A12.2. A12.2. A12.2.
★	UN3142	DISINFECTANTS, LIQUID, TOXIC, N.O.S.	6.1		I II III	P3, A4 P5 P5	A10.4. A10.4. A10.4.
★	UN1601	DISINFECTANTS, SOLID, TOXIC, N.O.S.	6.1		I II III	P3 P5 P5	A10.5 A10.5. A10.5.
	UN3253	DISODIUM TRIOXOSILICATE	8		III	P5	A12.3.
★		*Dispersant gas, see* REFRIGERANT GASES, N.O.S., *or* COMPRESSED GAS N.O.S. *or* LIQUEFIED GAS N.O.S., *etc.*					
		Dithiocarbamate pesticide, etc., see THIOCARBAMATE PESTICIDE, SOLID, TOXIC *or* THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC *or* THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE *or* THIOCARBAMATE PESTICIDE, LIQUID, TOXIC					
	UN1167	DIVINYL ETHER, STABILIZED	3		I	P3, A7	A7.2.
		Divinyl ether, unstabilized					FORBIDDEN
		DNOC, see DINITRO-O-CRESOL SOLID *or* DINITRO-O-CRESOL, SOLUTION					
	UN1771	DODECYLTRICHLOROSILANE	8		II	P4, A7, N34	A12.2.
		Dressing leather, see FLAMMABLE LIQUID, N.O.S.					
		Driers, paint or varnish liquid, n.o.s., see FLAMMABLE LIQUID, N.O.S.					
		Driers, paint, varnish solid, n.o.s., see FLAMMABLE SOLID, ORGANIC N.O.S. *or* INORGANIC N.O.S.					
		Drugs, corrosive, liquid or solid n.o.s., see CORROSIVE LIQUID, N.O.S. *or* CORROSIVE SOLID N.O.S.					
		Drugs, flammable, liquid n.o.s., see FLAMMABLE LIQUID, N.O.S.					
		Drugs, flammable, solid, n.o.s., see FLAMMABLE, SOLID, ORGANIC *or* FLAMMABLE, SOLID, INORGANIC, N.O.S.					
		Drugs, n.o.s., in small inner packagings containing flammable or non-flammable or flammable or toxic substance n.o.s., see CONSUMER COMMODITY					
		Drugs, oxidizing, liquid or solid n.o.s., see OXIDIZING LIQUID *or* OXIDIZING SOLID N.O.S.					
		Drugs, toxic, liquid or solid, n.o.s., see TOXIC LIQUID, N.O.S. *or* TOXIC SOLID, N.O.S.					
	UN1845	DRY ICE *or* CARBON DIOXIDE SOLID	9			P5	A13.10.
★	UN2801	DYES, LIQUID, CORROSIVE, N.O.S., *or* DYE INTERMEDIATES, LIQUID, CORROSIVE, N.O.S	8		I II III	P5, 11, A6 P5, 11 P5, 11	A12.2. A12.2. A12.2.
★	UN1602	DYES, LIQUID, TOXIC, N.O.S., *or* DYE INTERMEDIATES, LIQUID, TOXIC, N.O.S	6.1		I II III	P4 P4 P5	A10.4 A10.4. A10.4.
★	UN3147	DYES, SOLID, CORROSIVE, N.O.S., *or* DYE INTERMEDIATES, SOLID, CORROSIVE N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN3143	DYES, SOLID, TOXIC, N.O.S., *or* DYE INTERMEDIATES, SOLID, TOXIC, N.O.S.	6.1		I II III	P5, A5 P5 P5	A10.5. A10.5. A10.5.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Dynamite, see EXPLOSIVE, BLASTING, TYPE A					
		Electric squibs, see IGNITERS, *etc.*					
		Electric storage batteries, see BATTERIES, WET, FILLED WITH ACID *or* BATTERIES, WET, FILLED WITH ALKALI *or* BATTERIES, DRY, CONTAINING POTASSIUM					
		Electrolyte (acid or alkali) for batteries, see BATTERY FLUID, ACID *or* BATTERY FLUID, ALKALI					
		Electron tubes containing mercury, see MERCURY CONTAINED IN MANUFACTURED ARTICLES					
	UN3257	ELEVATED TEMPERATURE LIQUID, N.O.S., *at or above100 C, and below its flashpoint (including molten metals, molten salts, etc.)*					FORBIDDEN
	UN3256	ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S., *with flashpoint above 38.8C, at or above its flashpoint*					FORBIDDEN
	UN3258	ELEVATED TEMPERATURE SOLID, N.O.S., *at or above 240 C*					FORBIDDEN
	UN3166	ENGINES, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED *or* ENGINES, FUEL CELL, FLAMMABLE GAS POWERED	9			P5, 135	A13.5
	UN3166	ENGINES, INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED *or* ENGINES, FUEL CELL, FLAMMABLE LIQUID POWERED	9			P5, 135	A13.5
		Engines, rocket, see ROCKET MOTORS *or* ROCKET MOTORS WITH HYPERGOLIC LIQUIDS *or* ROCKET, MOTORS, LIQUID FUELLED					
★	UN3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.	9		III	P5, 8	A13.2.
★	UN3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.	9		III	P5, 8	A13.2.
	UN2558	EPIBROMOHYDRIN	6.1	3	I	P3	A10.4.
+	UN2023	EPICHLOROHYDRIN	6.1	3	II	P5	A10.4.
		1,2-Epoxybutane, stabilized, see 1,2-BUTYLENE OXIDE, STABILIZED					
		Epoxyethane, see ETHYLENE OXIDE					
	UN2752	1,2-EPOXY-3-ETHOXYPROPANE	3		III	P5	A7.2.
		2,3-Epoxy-1-propanal, see GLYCILALDEHYDE					
		2,3-epoxypropyl ethyl ether, see 1,2-EPOXY-3-ETHOXYPROPANE					
★	UN3272	ESTERS, N.O.S.	3		II III	P5 P5	A7.2. A7.2.
		Etching acid, liquid, n.o.s., see HYDROFLUORIC ACID, *etc.*					
	UN1035	ETHANE	2.1			P4	A6.3., A6.4.
D	NA1961	ETHANE-PROPANE MIXTURE, REFRIGERATED LIQUID	2.1				FORBIDDEN
	UN1961	ETHANE, REFRIGERATED LIQUID					FORBIDDEN
		Ethanethiol, see ETHYL MERCAPTAN					
	UN1170	ETHANOL *or* ETHANOL SOLUTIONS or ETHYL ALCOHOL *or* ETHYL ALCOHOL SOLUTIONS	3		II III	P5, A58 P5, A58	A7.2. A7.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN3475	ETHANOL AND GASOLINE MIXTURE *or* ETHANOL AND MOTOR SPIRIT MIXTURE *or* ETHANOL AND PETROL MIXTURE *with more than 10% ethanol*	3		II	P5	A7.2
	UN2491	ETHANOLAMINE *or* ETHANOLAMINE SOLUTIONS	8		III	P5	A12.2.
		Ethanol amine dinitrate					FORBIDDEN
		Ether, see DIETHYL ETHER					
		Ether acetate, see ETHYLENE GLYCOL MONOETHYL ETHER ACETATE					
		Ether, ethyl, see DIETHYL ETHER					
★	UN3271	ETHERS, N.O.S.	3		II III	P5 P5	A7.2. A7.2.
		2-Ethoxyethanol, see ETHYLENE GLYCOL MONOETHYL ETHER					
		2-Ethoxyethyl acetate, see ETHYLENE GLYCOL MONOETHYL ETHER ACETATE					
		Ethoxypropane-1, see ETHYL PROPYL ETHER					
	UN1173	ETHYL ACETATE	3		II	P5	A7.2.
		Ethylacetylene, unstabilized					FORBIDDEN
	UN1917	ETHYL ACRYLATE, STABILIZED	3		II	P5	A7.2.
		Ethyl acrylate, unstabilized					
		ETHYL ALCOHOL *see* ETHANOL					
		Ethyl aldehyde, see ACETALDEHYDE					
	UN2271	ETHYL AMYL KETONE	3		III	P5	A7.2.
	UN2274	N-ETHYL-N-BENZYLANILINE	6.1		III	P5	A10.4.
	UN1176	ETHYL BORATE	3		II	P5	A7.2.
	UN1891	ETHYL BROMIDE	6.1		II	P5	A10.4.
	UN1603	ETHYL BROMOACETATE	6.1	3	II	P4	A10.4.
	UN1179	ETHYL BUTYL ETHER	3		II	P5	A7.2.
	UN1180	ETHYL BUTYRATE	3		III	P5	A7.2.
	UN1037	ETHYL CHLORIDE	2.1			P4 , N86	A6.12.
	UN1181	ETHYL CHLOROACETATE	6.1	3	II	P5	A10.4.
		Ethyl chlorocarbonate, see ETHYL CHLOROFORMATE					
	UN1182	ETHYL CHLOROFORMATE	6.1	3, 8	I	P3, 2, A3, A6, A7, N34	A10.6.
		Ethyl-alpha-chloropropionate, see ETHYL 2-CHLOROPROPIONATE					
	UN2935	ETHYL 2-CHLOROPROPIONATE	3		III	P5	A7.2.
+	UN2826	ETHYL CHLOROTHIOFORMATE	8	3, 6.1	II	P2, 2	A12.11.
	UN1862	ETHYL CROTONATE	3		II	P5	A7.2.
		ETHYL ETHER, *see* DIETHYL ETHER					
	UN1155	ETHYL ETHER	3		I	P3	A7.2.
		Ethyl fluid, see MOTOR FUEL ANTI-KNOCK MIXTURE					
	UN2453	ETHYL FLUORIDE *or* REFRIGERANT GAS R161	2.1			P4	A6.3., A6.4.
	UN1190	ETHYL FORMATE	3		II	P5	A7.2.
	UN2385	ETHYL ISOBUTYRATE	3		II	P5	A7.2.
+	UN2481	ETHYL ISOCYANATE	6.1	3	I	P1, 1, A7	A10.6.
	UN1192	ETHYL LACTATE	3		III	P5	A7.2.
	UN2363	ETHYL MERCAPTAN	3		I	P3, A6	A7.2.
	UN2277	ETHYL METHACRYLATE, STABILIZED	3		II	P5	A7.2.
	UN1039	ETHYL METHYL ETHER	2.1			P4	A6.21.
	UN1193	ETHYL METHYL KETONE *or* METHYL ETHYL KETONE	3		II	P5	A7.2.
		Ethyl nitrate					FORBIDDEN
		Ethyl nitrite					FORBIDDEN
	UN1194	ETHYL NITRITE SOLUTIONS	3	6.1			FORBIDDEN
	UN2524	ETHYL ORTHOFORMATE	3		III	P5	A7.2.
	UN2525	ETHYL OXALATE	6.1		III	P5	A10.4.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Ethyl perchlorate					FORBIDDEN
D	NA2927	ETHYL PHOSPHONOTHIOIC DICHLORIDE, ANHYDROUS	6.1	8	I	P2, 2	A10.6.
D	NA2845	ETHYL PHOSPHONOUS DICHLORIDE, ANHYDROUS *pyrophoric liquid*	6.1	4.2	I	P2, 2	A10.6.
D	NA2927	ETHYL PHOSPHORODICHLORIDATE	6.1	8	I	P2, 2	A10.6.
	UN1195	ETHYL PROPIONATE	3		II	P5	A7.2.
	UN2615	ETHYL PROPYL ETHER	3		II	P5	A7.2.
		Ethyl silicate, see TETRAETHYL SILICATE					
		Ethyl sulphate, see DIETHYL SULPHATE					
		Ethylsulphuric acid, see ALKYLSULPHURIC ACIDS					
	UN2452	ETHYLACETYLENE, STABILIZED	2.1			P4, N88	A6.4.
		Ethylacetylene, unstabilized					FORBIDDEN
	UN1036	ETHYLAMINE	2.1			P4, N87	A6.14.
	UN2270	ETHYLAMINE, AQUEOUS SOLUTIONS *with not less than 50%, but not more than 70% ethylamine*	3	8	II	P5	A7.2.
	UN2272	N-ETHYLANILINE	6.1		III	P5	A10.4.
	UN2273	2-ETHYLANILINE	6.1		III	P5	A10.4.
	UN1175	ETHYLBENZENE	3		II	P5	A7.2.
	UN2753	N-ETHYLBENZYLTOLUIDINES LIQUID	6.1		III	P5	A10.4.
	UN3460	N-ETHYLBENZYLTOLUIDINES SOLID	6.1		III	P5	A10.5
	UN2275	2-ETHYLBUTANOL	3		III	P5	A7.2.
	UN1177	2-ETHYLBUTYL ACETATE	3		III	P5	A7.2.
	UN1178	2-ETHYLBUTYRALDEHYDE	3		II	P5	A7.2.
	UN1892	ETHYLDICHLOROARSINE	6.1		I	P2, 2	A10.6.
	UN1183	ETHYLDICHLOROSILANE	4.3	3, 8	I	P3, A2, A3, A7, N34	A8.2.
	UN1962	ETHYLENE	2.1			P4	A6.3., A6.4.
	UN3138	ETHYLENE, ACETYLENE AND PROPYLENE IN MIXTURES, REFRIGERATED LIQUID *(cryogenic liquids) with at least 71.5% ethylene with not more than 22.5% acetylene and not more than 6% propylene*	2.1				FORBIDDEN
	UN1135	ETHYLENE CHLOROHYDRIN	6.1	3	I	P2, 2	A10.6.
		Ethylene diamine diperchlorate					FORBIDDEN
	UN1605	ETHYLENE DIBROMIDE	6.1		I	P2, 2	A10.6.
		Ethylene diobromide and methyl bromide liquid mixtures, see METHYL BROMIDE AND ETHYLENE DIBROMIDE, LIQUID MIXTURES					
	UN1184	ETHYLENE DICHLORIDE	3	6.1	II	P4	A7.2.
	UN1153	ETHYLENE GLYCOL DIETHYL ETHER	3		II III	P5	A7.2.
		Ethylene glycol dinitrate					FORBIDDEN
	UN1171	ETHYLENE GLYCOL MONOETHYL ETHER	3		III	P5	A7.2.
	UN1172	ETHYLENE GLYCOL MONOETHYL ETHER ACETATE	3		III	P5	A7.2.
	UN1188	ETHYLENE GLYCOL MONOMETHYL ETHER	3		III	P5	A7.2.
	UN1189	ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE	3		III	P5	A7.2.
	UN1040	ETHYLENE OXIDE, *or* ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1 MPA (10 bar) at 50 degrees C	2.3	2.1		P2, 4	A6.13.
	UN1041	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURES *with more than 9% but not more than 87% ethylene oxide*	2.1			P4	A6.3., A6.4.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1952	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURES *with not more than 9% ethylene oxide*	2.2			P5	A6.3., A6.4.
	UN3300	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURES *with more than 87% ethylene oxide*	2.3	2.1		P2, 4	A6.4.
	UN3297	ETHYLENE OXIDE AND CHLOROTETRAFLUOROETHANE MIXTURE *with not more than 8.8% ethylene oxide*	2.2			P5	A6.3., A6.4.
	UN3070	ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE *with not more than 12.5% ethylene oxide*	2.2			P5	A6.3., A6.4.
	UN3298	ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE *with not more than 7.9% ethylene oxide*	2.2			P5	A6.3., A6.4.
	UN2983	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURES, *not more than 30% ethylene oxide*	3	6.1	I	P2, 5, A11, N4, N34	A7.2.
		Ethylene oxide and propylene oxide mixture, more than 30% ethylene oxide					FORBIDDEN
	UN3299	ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE *with not more than 5.6% ethylene oxide*	2.2			P5	A6.3., A6.4.
	UN1038	ETHYLENE, REFRIGERATED LIQUID *(cryogenic liquid)*	2.1			P3	A6.11.
	UN1604	ETHYLENEDIAMINE	8	3	II	P5	A12.2.
	UN1185	ETHYLENEIMINE, STABILIZED	6.1	3	I	P1, 1, N25, N32	A10.6.
		Ethyleneimine, unstabilized					FORBIDDEN
		Ethylhexaldehyde, see OCTYLALDEHYDES, *etc*					
	UN2748	2-ETHYLHEXYL CHLOROFORMATE	6.1	8	II	P5	A10.4.
		Ethyl hydroperoxide					FORBIDDEN
		Ethylidene chloride, see 1,1-DICHLOROETHANE					
	UN2276	2-ETHYLHEXYLAMINE	3	8	III	P5	A7.2.
	UN2435	ETHYLPHENYLDICHLOROSILANE	8		II	P5, A7, N34	A12.2.
		Ethyl phosphonous dichloride, anhydrous, see PYROPHORIC LIQUID, ORGANIC, N.O.S.					
	UN2386	1-ETHYLPIPERIDINE	3	8	II	P5	A7.2.
	UN2754	N-ETHYLTOLUIDINES	6.1		II	P5	A10.4.
	UN1196	ETHYLTRICHLOROSILANE	3	8	II	P4, A7, N34	A7.2.
		Ethyl trimethyl lead mixture lead mixture, see MOTOR FUEL ANTI-KNOCK MIXTURE					
		Etiologic agent, see INFECTIOUS SUBSTANCES, AFFECTING HUMANS *or* INFECTIOUS SUBSTANCES, AFFECTING ANIMALS					
		Explosive articles, see ARTICLES, EXPLOSIVE, N.O.S., *etc*					
	UN0081	EXPLOSIVE, BLASTING,TYPE A	1.1D		II	P4, A69	A5.11.
	UN0082	EXPLOSIVE, BLASTING,TYPE B	1.1D		II	P4, A69	A5.11.
	UN0331	EXPLOSIVE, BLASTING,TYPE B *or* AGENT BLASTING TYPE B	1.5D		II	P4, 105, 106, A69	A5.11.
	UN0083	EXPLOSIVE, BLASTING,TYPE C	1.1D		II	P4, 123, A69	A5.11.
	UN0084	EXPLOSIVE, BLASTING,TYPE D	1.1D		II	P4, A69	A5.11.
	UN0241	EXPLOSIVE, BLASTING,TYPE E	1.1D		II	P4, A69	A5.11.
	UN0332	EXPLOSIVE, BLASTING,TYPE E *or* AGENT BLASTING TYPE E	1.5D		II	P4, 105, 106, A69	A5.11.
		Explosive, emulsion or slurry, see EXPLOSIVE, BLASTING, TYPE E					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Explosive seismic, see EXPLOSIVE, BLASTING, TYPE A *or* TYPE B *or* TYPE C					
		Explosive substances, see SUBSTANCES, EXPLOSIVE, N.O.S. *etc.*					
		Explosives, water gels, see EXPLOSIVE, BLASTING, TYPE E					
		Extract, aromatic or flavoring, not falling under the definitions of classes 1-8, see AVIATION REGULATED LIQUID, N.O.S. *or* AVIATION REGULATED SOLID N.O.S.					
	UN1169	EXTRACTS, AROMATIC, LIQUID	3		II III	P5 P5	A7.2. A7.2.
	UN1197	EXTRACTS, FLAVORING, LIQUID	3		II III	P5 P5	A7.2. A7.2.
		Fabric with animal or vegetable oil, see FIBERS *or* FABRICS, *etc.*					
	UN1606	FERRIC ARSENATE	6.1		II	P5	A10.5.
	UN1607	FERRIC ARSENITE	6.1		II	P5	A10.5.
	UN1773	FERRIC CHLORIDE, ANHYDROUS	8		III	P5	A12.3.
	UN2582	FERRIC CHLORIDE, SOLUTION	8		III	P5	A12.2.
	UN1466	FERRIC NITRATE	5.1		III	P5, A1, A29	A9.6.
	UN1323	FERROCERIUM	4.1		II	P5, A19	A8.3.
	UN1408	FERROSILICON, *with 30% or more, but less than 90% silicon*	4.3	6.1	III	P5, A1, A19	A8.3.
	UN1608	FERROUS ARSENATE	6.1		II	P5	A10.5.
D	NA1759	FERROUS CHLORIDE, SOLID	8		II	P5	A12.3
D	NA1760	FERROUS CHLORIDE, SOLUTION	8		II	P5	A12.2
	UN2793	FERROUS METAL BORINGS, *or* FERROUS METAL SHAVINGS *or* FERROUS METAL TURNINGS *or* FERROUS METAL CUTTINGS *in a form liable to self-heating*	4.2		III	P5, A1, A19	A8.3.
	UN1043	FERTILIZER AMMONIATING SOLUTION *with free ammonia*	2.2			P5, N87	A6.3., A6.4.
		Fertilizers ammonium nitrate based, see AMMONIUM NITRATE BASED FERTILIZER					
		Fiberglass repair kit, see POLYESTER RESIN KIT					
	UN1372	FIBERS, ANIMAL *or* FIBERS, VEGETABLE *burnt, wet or damp*	4.2		III		FORBIDDEN
	UN3360	FIBERS, VEGETABLE, DRY	4.1		III	P5	A8.3.
	UN1373	FIBERS *or* FABRICS, ANIMAL *or* VEGETABLE, *or* SYNTHETIC N.O.S. *with animal or vegetable oil*	4.2		III	P5	A8.3.
	UN1353	FIBERS *or* FABRICS *or* FIBER IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S	4.1		III	P5, A1	A8.3.
	UN1324	FILMS, NITROCELLULOSE BASE, *gelatine coated (except scrap)*	4.1		III	P5	A8.12.
		Films, nitrocellulose base, from which gelatine has been removed, film scrap, see CELLULOID SCRAP					
	UN1774	FIRE EXTINGUISHER CHARGES, *corrosive liquid*	8		II	P5, N41	A12.2.
		Fire extinguisher charges, expelling, explosive, see CARTRIDGES, POWER DEVICE, *etc.*					
	UN1044	FIRE EXTINGUISHERS *containing compressed or liquefied gas*	2.2			P5	A6.7
	UN2623	FIRELIGHTERS, SOLID *with flammable liquid*	4.1		III	P5, A1, A19	A8.3.
	UN0333	FIREWORKS	1.1G		II	P4, 108	A5.18.
	UN0334	FIREWORKS	1.2G		II	P4, 108	A5.18.
	UN0335	FIREWORKS	1.3G		II	P4, 108	A5.18.
	UN0336	FIREWORKS	1.4G		II	P5, 108	A5.18.

Table A4.1 (1)	UN/ID NUMBER (2)	PROPER SHIPPING NAME/ DESCRIPTION (3)	HAZARD CLASS/ DIV (4)	SUBSIDIARY RISK (5)	PG (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	UN0337	FIREWORKS	1.4S		II	P5, 108	A5.18.
	UN3316	FIRST AID KITS	9			P5	A13.18.
	UN2216	FISH MEAL, STABILIZED *or* FISH SCRAP, STABILIZED	9		III	P5	A13.2
	UN1374	FISH MEAL, UNSTABILZED, *or* FISH SCRAP, UNSTABILIZED	4.2		II	P5, A1, A19	A8.3.
		Flammable compressed gas, see COMPRESSED GAS FLAMMABLE N.O.S *or* LIQUEFIED GAS, FLAMMABLE N.O.S.					
		Flammable compressed gas (small receptacles not fitted with a dispersion device, not refillable), see RECEPTACLES, *etc.*					
		Flammable gas in lighters, see LIGHTERS *or* LIGHTER REFILLS, *cigarettes, containing flammable gas*					
★	UN3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	6.1, 8 6.1, 8	I II	P3 P4	A7.2. A7.2.
★	UN1993	FLAMMABLE LIQUIDS, N.O.S.	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
★	UN2924	FLAMMABLE LIQUIDS, CORROSIVE, N.O.S.	3	8 8 8	I II III	P3 P5 P5	A7.2. A7.2. A7.2.
★	UN1992	FLAMMABLE LIQUIDS, TOXIC, N.O.S.	3	6.1 6.1 6.1	I II III	P3 P4 P5	A7.2. A7.2. A7.2.
★	UN3180	FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.	4.1	8 8	II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN3178	FLAMMABLE SOLID, INORGANIC, N.O.S.	4.1		II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN3176	FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.					FORBIDDEN
★	UN3097	FLAMMABLE SOLID, OXIDIZING, N.O.S.					FORBIDDEN
★	UN3179	FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.	4.1	6.1 6.1	II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN2925	FLAMMABLE SOLIDS, CORROSIVE, ORGANIC, N.O.S.	4.1	8 8	II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN1325	FLAMMABLE SOLIDS, ORGANIC, N.O.S.	4.1		II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN2926	FLAMMABLE SOLIDS, TOXIC, ORGANIC, N.O.S.	4.1	6.1 6.1	II III	P5, A1 P5, A1	A8.3. A8.3.
	UN0420	FLARES, AERIAL	1.1G		II	P4	A5.18.
	UN0421	FLARES, AERIAL	1.2G		II	P4	A5.18.
	UN0093	FLARES, AERIAL	1.3G		II	P4	A5.18.
	UN0403	FLARES, AERIAL	1.4G		II	P5	A5.18.
	UN0404	FLARES, AERIAL	1.4S		II	P5, A69	A5.18.
		Flares, airplane, see FLARES, AERIAL					
		Flares, distress, small, see SIGNAL DEVICES HAND					
		Flares, signal, see CARTRIDGES, SIGNAL					
		Flares, highway or railway, see SIGNAL DEVICES, HAND					
	UN0418	FLARES, SURFACE	1.1G		II	P4	A5.18.
	UN0419	FLARES, SURFACE	1.2G		II	P4	A5.18.
	UN0092	FLARES, SURFACE	1.3G		II	P4	A5.18.
		Flares, water-activated, see CONTRIVANCES, WATER-ACTIVATED, *etc.*					
	UN0094	FLASH POWDER	1.1G		II	P4	A5.8.
	UN0305	FLASH POWDER	1.3G		II	P4	A5.8.
		Flavoring liquids, see EXTRACTS, FLAVOURING					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Flue dusts, poisonous, see ARSENICAL DUST					
		Fluoric acid, see HYDROFLUORIC ACID, *etc.*					
	UN1045	FLUORINE, COMPRESSED	2.3	5.1, 8		P1, 1, N86	A6.6.
	UN2642	FLUOROACETIC ACID	6.1		I	P5	A10.5.
		2-Fluoroaniline or 4-Fluoroaniline or p-Fluoroaniline or o-Fluoroaniline, see FLUOROANILINES					
	UN2941	FLUOROANILINES	6.1		III	P5	A10.4.
	UN2387	FLUOROBENZENE	3		II	P5	A7.2.
	UN1775	FLUOROBORIC ACID	8		II	P5, A6, A7, N3, N34	A12.2.
		Fluoroethane, see ETHYL FLUORIDE					
		Fluoroform, see TRIFLUOROMETHANE					
		Fluoromethane, see FLUOROANILINES					
	UN1776	FLUOROPHOSPHORIC ACID, ANHYDROUS	8		II	P5, A6, A7, N3, N34	A12.2.
	UN2856	FLUOROSILICATES, N.O.S.	6.1		III	P5	A10.5.
	UN1778	FLUOROSILICIC ACID	8		II	P5, A6, A7, N3, N34	A12.2.
	UN1777	FLUOROSULFONIC ACID	8		I	P3, A3, A6, A7, A10, N3	A12.2.
	UN2388	FLUOROTOLUENES	3		II	P5	A7.2.
	UN2209	FORMALDEHYDE SOLUTIONS *with not less than 25% formaldehyde*	8		III	P5	A12.2.
	UN1198	FORMALDEHYDE SOLUTIONS, FLAMMABLE	3	8	III	P5	A7.2.
		Formaldehyde solution with not less than 10% more and no more than 25% formaldehyde, see AVIATION REGULATED LIQUID, N.O.S.					
		Formalin, see FORMALDEHYDE, SOLUTIONS, FLAMMABLE *or* FORMALDEHYDE SOLUTIONS					
		Formamidine sulphinic acid, see THIUREA DIOXIDE					
	UN3412	FORMIC ACID *with not less than 10% but no more than 85% acid by mass*	8		II	P5	A12.2
	UN3412	FORMIC ACID *with not less than 5% but less than 10% acid by mass*	8		III	P5	A12.2
	UN1779	FORMIC ACID *with more than 85% acid by mass*	8	3	II	P5	A12.2.
		Formic aldehyde, see FORMALDEHYDE, SOLUTIONS, FLAMMABLE *or* FOMALDEHYDE SOLUTION					
		Formic ether, see ETHYL FORMATE					
		2-Formyl-3,4-dihydro-2H-pyran, see ACROLEIN DIMER, STABILIZED					
	UN0099	FRACTURING DEVICES, EXPLOSIVE, *without detonators for oil wells*	1.1D		II	P4	A5.17.
	UN1863	FUEL, AVIATION, TURBINE ENGINE	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
	UN3473	FUEL CELL CARTRIDGES *or* FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT *or* FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT *containing flammable liquids*	3		II	P5	A7.7., A7.8., A7.9.
	UN3479	FUEL CELL CARTRIDGES *or* FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT *or* FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT *containing hydrogen in metal hydride*	2.1		II	P5	A6.23., A6.24., A6.25.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN3478	FUEL CELL CARTRIDGES *or* FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT *or* FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT *containing liquefied flammable gas*	2.1		II	P5	A6.23., A6.24., A6.25.
	UN3476	FUEL CELL CARTRIDGES *or* FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT *or* FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT *containing water- reactive substances*	4.3		II	P5	A8.19., A8.20., A8.21.
	UN3477	FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT *or* FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT *or* FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT *containing corrosive substances*	8		II	P5	A12.12., A12.13., A12.14.
		Fuel system components(including fuel control units (FCU), carburators, fuel lines, fuel pumps), see DANGEROUS GOODS IN APPARATUS *or* DANGEROUS GOODS IN MACHINERY					
		Fuel oil, see GAS OIL					
D	NA1993	FUEL OIL *(No, 1, 2, 3, 4, 5, or 6)*	3		III	P5	A7.2.
		Fulminate of mercury (dry)					FORBIDDEN
		Fulminate of mercury, wet, see MERCURY FULMINATE, WETTED *etc*.					
		Fulminating gold					FORBIDDEN
		Fulminating mercury					FORBIDDEN
		Fulminating platinum					FORBIDDEN
		Fulminating silver					FORBIDDEN
		Fulminic acid					FORBIDDEN
	UN1780	FUMARYL CHLORIDE	8		II	P5	A12.2.
		Fuming liquid arsenic, see ARSENIC TRICHLORIDE					
	UN1199	FURALDEHYDE	6.1	3	II	P2	A10.4.
	UN2389	FURAN	3		I	P3	A7.2.
	UN2874	FURFURYL ALCOHOL	6.1		III	P5	A10.4.
	UN2526	FURFURYLAMINE	3	8	III	P5	A7.2.
		Furyl carbinol, see FURFURYL ALCOHOL					
		FUSE, DETONATING, *mild effect,metal clad, see* CORD, DETONATING MILD EFFECT, *metal clad*					
	UN0290	FUSE, DETONATING, *metal clad*	1.1D		II	P4, A69	A5.22.
	UN0102	FUSE, DETONATING, *metal clad*	1.2D		II	P4, A69	A5.22.
	UN0104	FUSE DETONATING, MILD EFFECT, *metal clad*	1.4D		II	P5, A69	A5.22.
	UN0103	FUSE, IGNITER, *tubular metal clad*	1.4G		II	P5	A5.23.
	UN0101	FUSE, NON-DETONATING *(instantaneous or quickmatch)*	1.3G		II	P4	A5.23.
	UN0105	FUSE, SAFETY	1.4S		II	P5, A69	A5.23.
		Fusee, matches, see MATCHES, FUSEE					
		Fusees, railway or highway, explosive, see SIGNAL DEVICES, HAND					
D	NA1325	FUSEE *(railway or highway)*	4.1		II	P5	A8.13.
	UN1201	FUSEL OIL	3		II III	P5 P5	A7.2. A7.2.
		Fuses, tracer, see TRACERS FOR AMMUNITION					
		Fuzes, combination, percussion and time, see FUZES, DETONATING *or* FUZES, IGNITING					
	UN0106	FUZES, DETONATING	1.1B		II	P4	A5.24.
	UN0107	FUZES, DETONATING	1.2B		II	P4	A5.24.
	UN0257	FUZES, DETONATING	1.4B		II	P5, 116	A5.24.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN0367	FUZES, DETONATING	1.4S		II	P5, 116, A69	A5.24.
	UN0408	FUZES, DETONATING, *with protective features*	1.1D		II	P4	A5.24.
	UN0409	FUZES, DETONATING, *with protective features*	1.2D		II	P4	A5.24.
	UN0410	FUZES, DETONATING, *with protective features*	1.4D		II	P5, 116	A5.24.
	UN0316	FUZES, IGNITING	1.3G		II	P4	A5.24.
	UN0317	FUZES, IGNITING	1.4G		II	P4	A5.24.
	UN0368	FUZES, IGNITING	1.4S		II	P5, A69	A5.24.
		Galactan trinitrate					FORBIDDEN
	UN2803	GALLIUM	8		III	P3	A12.7.
		Gas candles, charged with flammable gas, see DEVICES, SMALL, HYDROCARBON GAS POWERED					
	UN2037	GAS CARTRIDGE, *(flammable) without a release device, non-refillable*	2.1			P4	A6.3., A6.4.
	UN2037	GAS CARTRIDGES, *(non-flammable) without release device, non-refillable*	2.2			P5	A6.3., A6.4.
	UN2037	GAS CARTRIDGES, *(oxidizing) without a release device, non-refillable*	2.2	5.1		P5	A6.3., A6.4.
	UN2037	GAS CARTRIDGES, *(toxic) without a release device, non-refillable*	2.3				FORBIDDEN
	UN2037	GAS CARTRIDGES, *(toxic and corrosive) without a release device, non-refillable*	2.3	8			FORBIDDEN
	UN2037	GAS CARTRIDGES, *(toxic and flammable) without a release device, non-refillable*	2.3	2.1			FORBIDDEN
	UN2037	GAS CARTRIDGES, *(toxic and oxidizing) without a release device, non-refillable*	2.3	5.1			FORBIDDEN
	UN2037	GAS CARTRIDGES, *(toxic, flammable and corrosive) without a release device non-refillable*	2.3	2.1, 8			FORBIDDEN
	UN2037	GAS CARTRIDGES	2.3	5.1, 8			FORBIDDEN
	ID8013	GAS GENERATOR ASSEMBLIES (AIRCRAFT), *containing a nonflammable, nontoxic gas and a propellant cartridge*	2.2			P5	A6.22.
D	NA9035	GAS IDENTIFICATION SET	2.3			P2, 6	A6.16.
		Gas compressed, see COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S. *or* COMPRESSED GAS, FLAMMABLE, N.O.S. *or* COMPRESSED GAS, TOXIC, N.O.S. *or* COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S. *or* COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. *or* COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. *or* COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.					
		Gas drips, hydrocarbon, see HYDROCARBONS, LIQUID, N.O.S.					
		Gas Liquefied see, LIQUEFIED GAS, OXIDIZING, N.O.S. *or* LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S. *or* LIQUEFIED GAS, FLAMMABLE GAS, N.O.S. *or* LIQUEFIED GAS, TOXIC, N.O.S. *or* LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S. *or* LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S. *or* LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. *or* LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.					
	UN1202	GAS OIL *or* DIESEL FUEL *or* HEATING OIL, LIGHT	3		III	P5	A7.2.
★	UN3158	GAS, REFRIGERATED LIQUID, N.O.S. *(cryogenic liquid)*	2.2			P4	A6.11.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3312	GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S. *(cryogenic liquid)*	2.1			P3	A6.11.
★	UN3311	GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S. *(cryogenic liquid)*	2.2	5.1		P4	A6.11.
	UN3167	GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE, N.O.S., *not refrigerated liquid*	2.1			P4	A6.3., A6.4., A6.5.
	UN3169	GAS SAMPLE, NON-PRESSURIZED, TOXIC, N.O.S., *not refrigerated liquid*	2.3			P4, 6	A6.3., A6.4., A6.5.
	UN3168	GAS SAMPLE, NON-PRESSURIZED, TOXIC, FLAMMABLE, N.O.S., *not refrigerated liquid*	2.3	2.1		P3	A6.3., A6.4.
		Gas turbine engines, see ENGINES, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED					
D	NA1203	GASOHOL *gasoline mixed with ethyl alcohol, with not more than 10 percent alcohol*	3		II	P5, 177	A7.2.
	UN1203	GASOLINE *includes gasoline mixed with ethyl alcohol, with not more than 10 percent alcohol*	3		II	P5, 177	A7.2.
		Gasoline, casinghead, see GASOLINE					
		Gelatine, blasting, see EXPLOSIVE, BLASTING, TYPE A					
		Gelatine dynamites, see EXPLOSIVE, BLASTING, TYPE A					
	UN3245	GENETICALLY MODIFIED MICRO-ORGANISMS *or* GENETICALLY MODIFIED ORGANISMS	9			P5, A	A10.8
	UN2192	GERMANE	2.3	2.1		P2, 2	A6.15.
		Glycerol-1,3-dinitrate					FORBIDDEN
		Glycerol gluconate trinitrate					FORBIDDEN
		Glycerol lactate trinitrate					FORBIDDEN
	UN2689	GLYCEROL ALPHA-MONOCHLOROHYDRIN	6.1		III	P5	A10.4.
		Glyceryl trinitrate, see NITROGLYCERIN, *etc.*					
	UN2622	GLYCIDALDEHYDE	3	6.1	II	P5	A7.2.
	UN0284	GRENADES, *hand or rifle, with bursting charge*	1.1D		II	P4	A5.24.
	UN0285	GRENADES, *hand or rifle, with bursting charge*	1.2D		II	P4	A5.24.
	UN0292	GRENADES, *hand or rifle, with bursting charge*	1.1F		II	P4	A5.24.
	UN0293	GRENADES, *hand or rifle, with bursting charge*	1.2F		II	P4	A5.24.
		Grenades, illuminating, see AMMUNITION, ILLUMINATING, *etc.*					
	UN0372	GRENADES, PRACTICE, *hand or rifle*	1.2G		II	P4	A5.24.
	UN0318	GRENADES, PRACTICE, *hand or rifle*	1.3G		II	P4	A5.24.
	UN0452	GRENADES, PRACTICE, *hand or rifle*	1.4G		II	P5	A5.24.
	UN0110	GRENADES, PRACTICE, *hand or rifle*	1.4S		II	P5, A69	A5.24.
		Grenades, smoke, see AMMUNITION, SMOKE, *etc.*					
	UN1467	GUANIDINE NITRATE	5.1		III	P5, A1	A9.6.
		Guanyl nitrosaminoguanylidene hydrazine (dry)					FORBIDDEN
	UN0113	GUANYL NITROSAMINOGUANYLIDENE HYDRAZINE, WETTED *with not less than 30% water, by mass*	1.1A		II	P3, 111, 117	A5.4.
		Guanyl nitrosaminoguanylidene hydrazine, wetted with less than 30% water					FORBIDDEN
		Guanyl nitrosaminoguanyltetrazene (dry)					FORBIDDEN

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN0114	GUANYL NITROSAMINOGUANYLTETRAZENE, WETTED, *or* TETRAZENE, WETTED *with not less than 30% water, or mixture of alcohol and water, by mass*	1.1A		II	P3, 111, 117	A5.4.
		Guanyl nitrosaminoguanyltetrazene, wetted with less than 30% water or mixture of alcohol and water					FORBIDDEN
		GUNPOWDER, COMPRESSED *or* GUNPOWDER IN PELLETS, *see* BLACK POWDER *(UN0028)*					
		GUNPOWDER, *granular or as a meal, see* BLACK POWDER					
	UN0027	GUNPOWDER, *granular or as meal*	1.1D		II	P4	A5.8.
	UN0028	GUNPOWDER, COMPRESSED *or* GUNPOWDER, IN PELLETS	1.1D		II	P4	A5.8.
	UN2545	HAFNIUM POWDER, DRY	4.2		I II III	P3 P5, A19, A20, N34 P5	A8.3. A8.3. A8.3.
	UN1326	HAFNIUM POWDER, WETTED *with not less than 25% water (a visible excess of water must be present) (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns*	4.1		II	P5, A6, A19, A20, N34	A8.3.
		Hair, wet, see FIBRES, SYNTHETIC, N.O.S. *or* FIBRES ANIMAL, N.O.S. *or* FIBRES, VEGETABLE N.O.S.					
		Hand signal device, see SIGNAL DEVICES, HAND					
		Hazardous substances, liquid or solid, n.o.s., see ENVIRONMENTALLY HAZARDOUS SUBSTANCES, *etc*					
D★	NA3082	HAZARDOUS WASTE, LIQUID, N.O.S.	9		III	P5	A13.2.
D★	NA3077	HAZARDOUS WASTE, SOLID, N.O.S.	9		III	P5	A13.2.
	UN1202	HEATING OIL LIGHT	3		III	P5	A7.2.
		Heat producing article battery operated equipment, such as underwater torches or soldering equipment, which, if accidentally activated, will generate extreme heat and cause fire					FORBIDDEN
		Heavy hydrogen, see DEUTERIUM, COMPRESSED					
	UN1046	HELIUM, COMPRESSED	2.2			P5	A6.3., A6.5.
		Helium, liquid, non-pressurized					FORBIDDEN
	UN1963	HELIUM, REFRIGERATED LIQUID*(cryogenic liquid)*	2.2			P5	A6.11.
	UN3296	HEPTAFLUOROPROPANE *or* REFRIGERANT GAS R227	2.2			P5	A6.3., A6.4.
	UN3056	N-HEPTALDEHYDE	3		III	P5	A7.2.
		n-Heptanal; *see* N-HEPTALDEHYDE					
	UN1206	HEPTANES	3		II	P5	A7.2.
		4-Hepatanone, see DIPROPYL KETONE					
	UN2278	N-HEPTENE	3		II	P5	A7.2.
	UN2661	HEXACHLOROACETONE	6.1		III	P5	A10.4.
	UN2729	HEXACHLOROBENZENE	6.1		III	P5	A10.4.
		Hexachloro-1,3-butadiene, see HEXACHLOROBUTADIENE					
	UN2279	HEXACHLOROBUTADIENE	6.1		III	P5	A10.4.
	UN2646	HEXACHLOROCYCLOPENTADIENE	6.1		I	P2, 2	A10.6.
	UN2875	HEXACHLOROPHENE	6.1		III	P5	A10.5.
		Hexachloro-2-propanone, see HEXACHLOROACETONE					

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1781	HEXADECYLTRICHLOROSILANE	8		II	P4, A7, N34	A12.2.
	UN2458	HEXADIENES	3		II	P5	A7.2.
	UN1612	HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURES	2.3			P2, 3	A6.18.
	UN1611	HEXAETHYL TETRAPHOSPHATE, LIQUID *or* HEXAETHYL TETRAPHOSPHATE, SOLID	6.1		II	P5, N76	A10.4., A10.5.
	UN2420	HEXAFLUOROACETONE	2.3	8		P2, 2	A6.4.
	UN2552	HEXAFLUOROACETONE HYDRATE, LIQUID	6.1		II	P5	A10.4.
	UN3436	HEXAFLUOROACETONE HYDRATE, SOLID	6.1		II	P5	A10.5.
	UN2193	HEXAFLUOROETHANE *or* REFRIGERANT GAS R116	2.2			P5	A6.3., A6.4.
	UN1782	HEXAFLUOROPHOSPHORIC ACID	8		II	P5, A6, A7, N3, N34	A12.2.
	UN1858	HEXAFLUOROPROPYLENE, COMPRESSED *or* REFRIGERANT GAS R1216	2.2			P5	A6.3., A6.4.
		Hexahydrobenzene, see CYCLOHEXANE					
		Hexahydrocresol or Hexahydromethyl phenol, see METHYLCYCLOHEXANOLS					
		Hexahydrotoluene, see METHYLCYCLOHEXANE					
	UN1207	HEXALDEHYDE	3		III	P5	A7.2.
		Hexamethylene, see CYCLOHEXANE					
	UN2281	HEXAMETHYLENE DIISOCYANATE	6.1		II	P5	A10.4.
	UN2280	HEXAMETHYLENEDIAMINE, SOLID	8		III	P5	A12.3.
	UN1783	HEXAMETHYLENEDIAMINE SOLUTION	8		II III	P5 P5	A12.2. A12.2.
	UN2493	HEXAMETHYLENEIMINE	3	8	II	P5	A7.2.
	UN1328	HEXAMETHYLENETETRAMINE	4.1		III	P5, A1	A8.3.
		Hexamethylene triperoxide diamine (dry)					FORBIDDEN
		Hexamethylol benzene hexanitrate					FORBIDDEN
		3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane, more than 52%					FORBIDDEN
		Hexamine, see HEXAMETHYLENETETRAMINE					
	UN1208	HEXANES	3		II	P5	A7.2.
		Hexanitroazoxy benzene					FORBIDDEN
		2,2,4,4,6,6-Henanitro-3,3-dihyroxyazobenzene (dry)					FORBIDDEN
	UN0079	HEXANITRODIPHENYLAMINE *or* DIPICRYLAMINE *or* HEXYL	1.1D		II	P4	A5.6.
		2,3,4,4,6,6-Henanitrodiphenylether					FORBIDDEN
		N,N'-(Hexanitrodiphenyl) ethylene dinitramine (dry)					FORBIDDEN
		2,2,3,4,4,6- Hexanitrodiphenylamine					FORBIDDEN
		Hexanitrodiphenyl urea					FORBIDDEN
		Hexanitroethane					FORBIDDEN
		Hexanitrooxanilide					FORBIDDEN
	UN0392	HEXANITROSTILBENE	1.1D		II	P4	A5.6.
		Hexanoic acid, see CAPROIC ACID *or* CORROSIVE LIQUIDS, N.O.S.					
	UN2282	HEXANOLS	3		III	P5	A7.2.
	UN2370	1-HEXENE	3		II	P5	A7.2.
	UN0391	HEXOGEN AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, DESENSITIZED *with not less than 10% phlegmatizer, by mass*	1.1D		II	P4	A5.6.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN0391	HEXOGEN AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, WETTED *with not less than 15% water, by mass*	1.1D		II	P4	A5.6.
	UN0483	HEXOGEN, DESENSITIZED	1.1D		II	P4	A5.6.
	UN0072	HEXOGEN, WETTED, *with not less than 15% water, by weight*	1.1D		II	P4	A5.6.
	UN0118	HEXOLITE, *or* HEXOTOL *dry or wetted with less than 15% water, by mass*	1.1D		II	P4	A5.6.
	UN0393	HEXOTONAL	1.1D		II	P4	A5.6.
	UN0079	HEXYL; *see* HEXANITRODIPHENYLAMINE	1.1D		II	P4	A5.6.
	UN1784	HEXYLTRICHLOROSILANE	8		II	P4, A7, N34	A12.2.
	UN0484	HMX, DESENSITIZED	1.1D		II	P4	A5.6.
	UN0226	HMX, WETTED, *with not less than 15% water, by weight*	1.1D		II	P4	A5.6.
	UN2029	HYDRAZINE, ANHYDROUS	8	3, 6.1	I	P3, A3, A6, A7, A10, A510	A12.2.
		Hydrazine azide					FORBIDDEN
		Hydrazine chlorate					FORBIDDEN
		Hydrazine dicarbonic acid diazide					FORBIDDEN
	UN3293	HYDRAZINE, AQUEOUS SOLUTION *with not more than 37% hydrazine, by mass*	6.1		III	P5	A10.4.
	UN2030	HYDRAZINE AQUEOUS SOLUTION, *with more than 37% hydrazine by mass*	8	6.1 6.1 6.1	I II III	P3 P4 P4	A12.2 A12.2. A12.2
	UN3484	HYDRAZINE AQUEOUS SOLUTION, FLAMMABLE *with more than 37% hydrazine by mass*	8	3, 6.1	I	P3	A12.2
		Hydrazine perchlorate					FORBIDDEN
		Hydrazine selenate					FORBIDDEN
		Hydriodic acid, anhydrous, see HYDROGEN IODIDE, ANHYDROUS					
		Hydrides, metal, water-reactive, n.o.s., see METAL HYDRIDES, WATER-REACTIVE, N.O.S.					
	UN1787	HYDRIODIC ACID	8		II III	P5, A3, A6, N41 P5	A12.2. A12.2.
		Hydriodic acid, anhydrous, see HYDROGEN IODIDE, ANHYDROUS					
		Hydrobromic acid, anhydrous, see HYDROGEN BROMIDE, ANHYDROUS					
	UN1788	HYDROBROMIC ACID *with more than 49% hydrobromic acid*	8		II III	P4, N41 P5	A12.2. A12.2.
	UN1788	HYDROBROMIC ACID *with not more than 49% hydrobromic acid*	8		II III	P5, A3, A6, N41 P5	A12.2. A12.2.
		Hydrobromic, acid, anhydrous, see HYDROGEN BROMIDE, ANHYDROUS					
		Hydrobromic ether, see ETHYL BROMIDE					
★	UN1964	HYDROCARBON GAS, MIXTURES COMPRESSED, N.O.S.	2.1			P4	A6.3., A6.5.
★	UN1965	HYDROCARBON GAS, MIXTURES, LIQUEFIED, N.O.S	2.1			P4	A6.3., A6.4.
		Hydrocarbon gas-powered small devices, see DEVICES, SMALL, HYDROCARBON GAS POWERED					
	UN3150	HYDROCARBON GAS REFILLS FOR SMALL DEVICES, *with release devices*	2.1			P5	A6.3., A6.4.
	UN3295	HYDROCARBONS, LIQUID, N.O.S.	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1789	HYDROCHLORIC ACID	8		II III	P4, A3, A6, N41 P5, A3	A12.2. A12.2.
		Hydrochloric acid, anhydrous, see HYDROGEN CHLORIDE, ANHYDROUS					
		Hydrocyanic acid, anhydrous, see HYDROGEN CYANIDE, STABILIZED					
	UN1613	HYDROCYANIC ACID, AQUEOUS SOLUTIONS *or* HYDROGEN CYANIDE, AQUEOUS SOLUTIONS *not more than 20% hydrogen cyanide*	6.1		I		FORBIDDEN
		Hydrocyanic acid, aqueous solution, more than 20% hydrogen cyanide					FORBIDDEN
		Hydrofluboric acid, see FLUOROBORIC ACID					
D	NA1613	HYDROCYANIC ACID, AQUEOUS SOLUTIONS *with less than 5% hydrogen cyanide*					FORBIDDEN
		HYDROCYANIC ACID (PRUSSIC) UNSTABILIZED					FORBIDDEN
	UN1790	HYDROFLUORIC ACID, *with more than 60% strength*	8	6.1	I	P3, A6, A7, N5, N34	A12.2.
	UN1790	HYDROFLUORIC ACID, *with not more than 60% strength*	8	6.1	II	P4, A6, A7, N5, N34	A12.2.
	UN1786	HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURES	8	6.1	I	P3, A6, A7, N5, N34	A12.2.
		Hydrofluoric acid, anhydrous, see HYDROGEN FLUORIDE, ANHYDROUS					
		Hydrofluosilicic acid, see FLUOROSILICIC ACID					
	UN2034	HYDROGEN AND METHANE MIXTURES, COMPRESSED	2.1			P4, N89	A6.3., A6.5.
		Hydrogen arsenide, see ARSINE					
	UN1048	HYDROGEN BROMIDE, ANHYDROUS	2.3	8		P2, 3, N86, N89	A6.4.
		Hydrogen bromide solution, see HYDROBROMIC ACID					
	UN1050	HYDROGEN CHLORIDE, ANHYDROUS	2.3	8		P2, 3, N86, N89	A6.4.
	UN2186	HYDROGEN CHLORIDE, REFRIGERATED LIQUID	2.3	8			FORBIDDEN
	UN1049	HYDROGEN, COMPRESSED	2.1			P4, N89	A6.3., A6.5.
	UN3294	HYDROGEN CYANIDE, SOLUTION IN ALCOHOL, *with not more than 45% of hydrogen cyanide*	6.1	3	I		FORBIDDEN
	UN1051	HYDROGEN CYANIDE, STABILIZED, *with less than 3% water*	6.1	3	I		FORBIDDEN
	UN1614	HYDROGEN CYANIDE, STABILIZED, *containing less than 3% water and absorbed in a porous inert material*	6.1		I		FORBIDDEN
		Hydrogen cyanide, unstabilized					FORBIDDEN
	UN1052	HYDROGEN FLUORIDE, ANHYDROUS	8	6.1	I	P2, 3, N86	A12.8.
		Hydrogen fluoride solution, see HYDROFLUORIC ACID					
	UN3468	HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM *or* HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM CONTAINED IN EQUIPMENT *or* HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM PACKED WITH EQUIPMENT	2.1			P4, 167	A6.26
	UN2197	HYDROGEN IODIDE, ANHYDROUS	2.3	8		P2, 3, N86, N89	A6.4.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Hydrogen iodide solution, see HYDRIODIC ACID, SOLUTION					
		Hydrogen liquid, see HYDROGEN, REFRIGERATED LIQUID					
	UN3149	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURES, STABILIZED *with acids, water and not more than 5% peroxyacetic acid,*	5.1	8	II	P5, A2, A3, A6	A9.5.
	UN2014	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS *with more than 40%, but not more than 60% hydrogen peroxide (stabilized as necessary)*	5.1	8			FORBIDDEN
	UN2014	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS *with not less than 20%, but not more than 40% hydrogen peroxide (stabilized as necessary)*	5.1	8	II	P5, A2, A3, A6	A9.5.
	UN2984	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS *with not less than 8%, but less than 20% hydrogen peroxide(stabilized as necessary)*	5.1		III	P5, A1	A9.5.
	UN2015	HYDROGEN PEROXIDE, STABILIZED *or* HYDROGEN PEROXIDE AQUEOUS SOLUTIONS, STABILIZED *with more than 60% hydrogen peroxide*	5.1	8			FORBIDDEN
		Hydrogen phosphide, see PHOSPHINE					
	UN1966	HYDROGEN, REFRIGERATED LIQUID*(cryogenic liquid)*	2.1			P3	A6.11.
	UN2202	HYDROGEN SELENIDE, ANHYDROUS	2.3	2.1			FORBIDDEN
		Hydrogen silicide, see SILANE					
		Hydrogen sulfate, see SULFURIC ACID					
	UN1053	HYDROGEN SULFIDE	2.3	2.1		P2, 2, N89	A6.4.
		Hydroselenic acid, see HYDROGEN SELENIDE					
		Hydrosilicofluoric acid, see FLUOROSILICIC ACID					
		Hydroxybenzene, see PHENOL, SOLID					
		3-Hydroxybutan-2-one, see ACETYL METHYL CARBINOL					
		3-(2-Hydroxyethoxy(-4-pyrrolidin-1-ylbenzenediazonium zinc chloride, see SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED					
		Hydroxyl Amine iodide					FORBIDDEN
	UN1740	HYDROGENDIFLUORIDES, SOLID N.O.S.	8		II III	P5, N3, N34 P5, N3, N34	A12.3. A12.3.
	UN3471	HYDROGENDIFLUORIDES, SOLUTION N.O.S.	8	6.1	II III	P5, N3, N34 P5, N3, N34	A12.2. A12.2.
		Hydrosilicofluoric acid, see FLUOROSILICIC ACID					
	UN2865	HYDROXYLAMINE SULFATE	8		III	P5	A12.3.
		1-Hydroxy-3-methyl-2-penten-4-yne, see 1-PENTOL					
		3-Hydroxyphenol, see RESORCINOL					
	UN0508	1-HYDROXYBENZOTRIAZOLE ANHYDROUS *dry or wetted with less than 20%, by mass*					FORBIDDEN
	UN3474	1-HYDROXYBENZOTRIAZOLE ANHYDROUS, MONOHYDRATE	4.1		I	P4, N90	A8.3.
	UN1791	HYPOCHLORITE SOLUTIONS	8		II III	P5, A7, N34 P5, N34	A12.2. A12.2.
	UN3212	HYPOCHLORITES, INORGANIC, N.O.S.	5.1		II	P5, A9	A9.6.
		Hyponitrous acid					FORBIDDEN

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Igniter fuse, metal clad, see FUSE, IGNITER, *tubular, metal clad*					
	UN0121	IGNITERS	1.1G		II	P4	A5.25.
	UN0314	IGNITERS	1.2G		II	P4	A5.25.
	UN0315	IGNITERS	1.3G		II	P5	A5.25.
	UN0325	IGNITERS	1.4G		II	P5	A5.25.
	UN0454	IGNITERS	1.4S		II	P5, A69	A5.25.
		Ignition element for lighter, containing pyrophoric liquid					FORBIDDEN
	UN2269	3,3'-IMINODIPROPYLAMINE	8		III	P5	A12.2.
		Indiarubber, see RUBBER SOLUTION					
★	UN2900	INFECTIOUS SUBSTANCES, AFFECTING ANIMALS, *liquid or solid*	6.2			P3, A140	A10.8
★	UN2814	INFECTIOUS SUBSTANCES, AFFECTING HUMANS, *liquid or solid*	6.2			P1, A140, A502	A10.8
		Inflammable, see FLAMMABLE, *etc.*					
		Initiating explosives (dry)					FORBIDDEN
		Inositol hexanitrate (dry)					FORBIDDEN
	UN1967	INSECTICIDE GAS, TOXIC, N.O.S.	2.3				FORBIDDEN
★	UN1968	INSECTICIDE GASES, N.O.S, *(aerosols in boxes) or (cylinders)*	2.2			P5	A6.3., A6.5.
★	UN3354	INSECTICIDE GASES, FLAMMABLE, N.O.S	2.1			P4	A6.3., A6.5.
	UN3355	INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	2.1			FORBIDDEN
★	UN3355	INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S *Inhalation hazard Zone A*	2.3	2.1			FORBIDDEN
★	UN3355	INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S *Inhalation hazard Zone B*	2.3	2.1			FORBIDDEN
★	UN3355	INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S *Inhalation hazard Zone C*	2.3	2.1			FORBIDDEN
★	UN3355	INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S *Inhalation hazard Zone D*	2.3	2.1			FORBIDDEN
		Inulin trinate (dry)					FORBIDDEN
		Iodine azide (dry)					FORBIDDEN
+	UN3495	IODINE	8	6.1	III	P5	A12.3.
	UN1792	IODINE MONOCHLORIDE	8		II	P4, N41	A12.3.
	UN2495	IODINE PENTAFLUORIDE	5.1	6.1, 8	I	P3	A9.7.
	UN2390	2-IODOBUTANE	3		II	P5	A7.2.
		Iodomethane, see METHYL IODIDE					
	UN2391	IODOMETHYLPROPANES	3		II	P5	A7.2.
	UN2392	IODOPROPANES	3		III	P5	A7.2.
		alpha-Iodotoluene, see BENZYL IODIDE					
		Iodoxy compounds (dry)					FORBIDDEN
		IDPI, see ISOPHORONE DIISOCYANATE					
		Iridium nitratopentamine iridium nitrate					FORBIDDEN
		Iron arsenate, see FERROUS ARSENATE					
		Iron chloride anhydrous, see FERRIC CHLORIDE ANHYDROUS					
		Iron chloride solution, see FERRIC CHLORIDE SOLUTION					
		Iron (III) chloride, anhydrous, see FERRIC CHLORIDE, ANHYDROUS					
	UN1376	IRON OXIDE, SPENT, *or* IRON SPONGE, SPENT *obtained from coal gas purification*	4.2		III		FORBIDDEN
	UN1994	IRON PENTACARBONYL	6.1	3	I	P1, 1	A10.6.
		Iron perchloride, anhydrous, see FERRIC CHLORIDE, ANHYDROUS					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Iron powder, pyrophoric, see PYROPHORIC METAL, N.O.S. *or* PYROPHORIC ALLOY, N.O.S.					
		Iron sesquichloride, see FERRIC CHLORIDE					
		Iron swarf, see FERROUS METAL SHAVINGS *or* FERROUS METAL *or* FERROUS METAL TURNINGS CUTTINGS *or* FERROUS METAL BORINGS					
		Irritating agents or materials, see TEAR GAS SUBSTANCE LIQUID *or* TEAR GAS SUBSTANCE, SOLID, N.O.S.					
	UN1969	ISOBUTANE *or* PETROLEUM GASES, LIQUEFIED	2.1			P4,	A6.3., A6.4.
	UN1212	ISOBUTANOL *or* ISOBUTYL ALCOHOL	3		III	P5	A7.2.
		Isobutene, see ISOBUTYLENE					
	UN1213	ISOBUTYL ACETATE	3		II	P5	A7.2.
	UN2527	ISOBUTYL ACRYLATE, STABILIZED	3		III	P5	A7.2.
		Isobutyl Alcohol, see ISOBUTANOL					
		Isobutyl Aldehyde, see ISOBUTYRALDEHYDE					
	UN2045	ISOBUTYL ALDEHYDE *or* ISOBUTYRALDEHYDE	3		II	P5	A7.2.
	UN2393	ISOBUTYL FORMATE	3		II	P5	A7.2.
	UN2528	ISOBUTYL ISOBUTYRATE	3		III	P5	A7.2.
+	UN2486	ISOBUTYL ISOCYANATE	6.1	3	I	P1, 1	A10.6.
	UN2283	ISOBUTYL METHACRYLATE, STABILIZED	3		III	P5	A7.2.
	UN2394	ISOBUTYL PROPIONATE	3		III	P5	A7.2.
	UN1214	ISOBUTYLAMINE	3	8	II	P5	A7.2.
	UN1055	ISOBUTYLENE *or* PETROLEUM GASES, LIQUEFIED	2.1			P4	A6.3., A6.4.
	UN2529	ISOBUTYRIC ACID	3	8	III	P5	A7.2.
	UN2284	ISOBUTYRONITRILE	3	6.1	II	P5	A7.2.
	UN2395	ISOBUTYRYL CHLORIDE	3	8	II	P5	A7.2.
★	UN2478	ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. *or* ISOCYANATE SOLUTIONS, FLAMMABLE, TOXIC, N.O.S., *flashpoint less than 23 degrees C*	3	6.1	II III	P2, 5, A3, A7 P4, 5, A3, A7	A7.2.
★	UN3080	ISOCYANATES, TOXIC, FLAMMABLE N.O.S. *or* ISOCYANATE SOLUTIONS, TOXIC, FLAMMABLE, N.O.S., *flashpoint not less than 23 degrees C but not more than 61 degrees C and boiling point less than 300 degrees C*	6.1	3	II	P4	A10.4.
★	UN2206	ISOCYANATES, TOXIC N.O.S. *or* ISOCYANATE SOLUTIONS, TOXIC N.O.S., *flashpoint more than 61 degrees C and boiling point less than 300 degrees C*	6.1		II III	P4 P4	A10.4. A10.4.
	UN2285	ISOCYANATOBENZOTRIFLUORIDES	6.1	3	II	P2, 5	A10.4.
		3-Isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate, see ISOPHORONE DIISOCYANATE					
		Isododecane, see PENTAMETHYLHEPTANE					
	UN2287	ISOHEPTENES	3		II	P5	A7.2.
	UN2288	ISOHEXENES	3		II	P5	A7.2.
		Isooctane, see OCTANES					
	UN1216	ISOOCTENES	3		II	P5	A7.2.
		Isonpentane, see PENTANES					
		Isopentanoic acid, see CORROSIVE LIQUIDS N.O.S.					
	UN2371	ISOPENTENES	3		I	P3	A7.2.
		Isopentyl nitrite, see AMYL NITRITE					
		Isopentylamine, see AMYLAMINE					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2290	ISOPHORONE DIISOCYANATE	6.1		III	P5	A10.4.
	UN2289	ISOPHORONEDIAMINE	8		III	P5	A12.2.
	UN1218	ISOPRENE, STABILIZED	3		I	P3	A7.2.
		Isoprene, unstabilized					FORBIDDEN
	UN1219	ISOPROPANOL *or* ISOPROPYL ALCOHOL	3		II	P5	A7.2.
	UN2403	ISOPROPENYL ACETATE	3		II	P5	A7.2.
	UN2303	ISOPROPENYLBENZENE	3		III	P5	A7.2.
	UN1220	ISOPROPYL ACETATE	3		II	P5	A7.2.
	UN1793	ISOPROPYL ACID PHOSPHATE	8		III	P5	A12.3.
		Isopropyl Alcohol, see ISOPROPANOL					
	UN2405	ISOPROPYL BUTYRATE	3		III	P5	A7.2.
		Isopropyl chloride, see 2-CHLOROPROPANE					
	UN2947	ISOPROPYL CHLOROACETATE	3		III	P5	A7.2.
	UN2407	ISOPROPYL CHLOROFORMATE	6.1	3, 8	I	P2, 2	A10.6.
		Isopropyl-alpha-chloropropionate, see ISOPROPYL 2-CHLOROPROPIONATE					
	UN2934	ISOPROPYL 2-CHLOROPROPIONATE	3		III	P5	A7.2.
		Isopropylcumyl hydroperoxide, more than 72% in solution					FORBIDDEN
		Isopropyl ether, see DIISOPROPYL ETHER					
		Isopropylethylene, see 3-METHYL-1-BUTENE					
		Isopropyl formate, see PROPYL FORMATES					
	UN2406	ISOPROPYL ISOBUTYRATE	3		II	P5	A7.2.
+	UN2483	ISOPROPYL ISOCYANATE	6.1	3	I	P1, 1	A10.6.
		Isopropyl mercaptan, see PROPANETHIOLS					
	UN1222	ISOPROPYL NITRATE	3		II	P5	A7.2.
		Isopropyl phosphoric acid, see ISOPROPYL ACID PHOSPHATE					
	UN2409	ISOPROPYL PROPIONATE	3		II	P5	A7.2.
		Isopropyltoluene or Isopropyltoluol, see CYMENES					
	UN1221	ISOPROPYLAMINE	3	8	I	P3	A7.2.
	UN1918	ISOPROPYLBENZENE	3		III	P5	A7.2.
		Isopropyl bromide, see BROMOPROPANES					
		Isopropyl sec-butyl peroxydicarbonate, not more than 52%, with di-sec-butyl peroxydicarbonate, not more than 22%					FORBIDDEN
	UN2907	ISOSORBIDE DINITRATE MIXTURE *with not less than 60% lactose, mannose, starch or calcium hydrogen phosphate*	4.1		II	P5	A8.3.
		Isosorbide dinitrate mixture with less than 60% lactose, mannose, starch or calcium hydrogen phosphate					FORBIDDEN
	UN3251	ISOSORBIDE-5-MONONITRATE	4.1		III	P5	A8.3.
		Isothiocyanic acid					FORBIDDEN
		Isovaleradelhyde, see VALERADEHYDE					
		Jet fuel, see FUEL, AVIATION, TURBINE ENGINE					
D	NA0124	JET PERFORATING GUNS, CHARGED *oil well, with detonator*	1.1D		II		FORBIDDEN
D	NA0494	JET PERFORATING GUNS, CHARGED *oil well, with detonator*	1.4D		II	P5, 56, A69	A5.3.
	UN0124	JET PERFORATING GUNS, CHARGED *oil well, without detonator*	1.1D		II		FORBIDDEN
	UN0494	JET PERFORATING GUNS, CHARGED *oil well, without detonator*	1.4D		II	P5, 56, A69	A5.3.
		Jet perforators, see CHARGES, SHAPED,					
		Jet tappers, without detonator, see CHARGES, SHAPED, *etc.*					
		Jet thrust igniters, for rocket motors or Jato, see IGNITERS, *etc.*					
		Jet thrust unit (Jato), see ROCKET MOTORS					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Jute or Kapok, see FIBRES, ANIMAL, N.O.S.					
	UN1223	KEROSENE	3		III	P5	A7.2.
		Ketone oils, see ACETONE OILS					
★	UN1224	KETONES, LIQUID, N.O.S.	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
	UN1056	KRYPTON, COMPRESSED	2.2			P5	A6.3., A6.5.
	UN1970	KRYPTON, REFRIGERATED LIQUID*(cryogenic liquid)*	2.2			P4	A6.11.
		Lacquer base or lacquer chips,nitrocellulose, dry, see NITROCELLULOSE, *etc*					
		Lacquer base or lacquer chips, plastic, wet with alcohol or solvent, see NITROCELLULOSE *or* PAINT, *etc.*					
		Lacquer, liquid, see NITROCELLULOSE *or* PAINT, *etc.*					
		Lamp black, see CARBON					
	UN1616	LEAD ACETATE	6.1		III	P5	A10.5.
	UN1617	LEAD ARSENATES	6.1		II	P5	A10.5.
	UN1618	LEAD ARSENITES	6.1		II	P5	A10.5.
		Lead azide (dry)					FORBIDDEN
	UN0129	LEAD AZIDE, *wetted with not less than 20% water or mixture of alcohol and water, by mass*	1.1A		II	P3, 111, 117	A5.4.
		Lead azide, wetted, with less than 20% water or mixture of alcohol and water					FORBIDDEN
		Lead chloride, solid, see LEAD COMPOUND, SOLUBLE, N.O.S.					
	UN2291	LEAD COMPOUNDS, SOLUBLE, N.O.S.	6.1		III	P5	A10.5.
	UN1620	LEAD CYANIDE	6.1		II	P5	A10.5.
	UN1872	LEAD DIOXIDE	5.1		III	P5, A1	A9.6.
		Lead (II) acetate, see LEAD ACETATE					
		Lead (II) cyanide, see LEAD CYANIDE					
		Lead dross, see LEAD SULFATE, *with more than 3% free acid*					
		Lead (II) nitrate, see LEAD NITRATE					
		Lead (II) perchlorate, see LEAD PERCHLORATE, SOLID *or* LEAD PERCHLORATE SOLUTION					
	UN1469	LEAD NITRATE	5.1	6.1	II	P5	A9.6.
		Lead nitroresorcinate (dry)					FORBIDDEN
	UN1470	LEAD PERCHLORATE SOLID	5.1	6.1	II	P5	A9.6.
	UN3408	LEAD PERCHLORATE SOLUTION	5.1	6.1	II III	P5 P5	A9.5. A9.5.
		Lead peroxide, see LEAD DIOXIDE					
	UN2989	LEAD PHOSPHITE, DIBASIC	4.1		II III	P5 P5	A8.3. A8.3.
		Lead picrate (dry)					FORBIDDEN
		Lead styphnate (dry)					FORBIDDEN
	UN0130	LEAD STYPHNATE, WETTED *or* LEAD TRINITRORESORCINATE, WETTED *with not less than 20% water or mixture of alcohol and water, by mass*	1.1A		II	P3, 111, 117	A5.4.
		Lead styphnate, wetted with less than 20% water or mixture of alcohol and water					FORBIDDEN
	UN1794	LEAD SULFATE *with more than 3% free acid*	8		II	P5	A12.3.
		Lead tetraethyl or Lead tetramethyl, see MOTOR FUEL ANTI-KNOCK MIXTURE					
		Lead tetramethyl, see MOTOR FUEL					
		Lead trinitroresorcinate (dry)					FORBIDDEN
		LEAD TRINITRORESORCINATE, *see* LEAD STYPHNATE, *etc.*					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Leather bleach or dressing, see FLAMMABLE LIQUID, TOXIC, N.O.S. *or* FLAMMABLE LIQUID, N.O.S. *or* FLAMMABLE LIQUID, CORROSIVE, N.O.S.					
	UN3072	LIFE-SAVING APPLIANCES, NOT SELF INFLATING *containing dangerous goods as equipment*	9			P5	A13.12.
	UN2990	LIFE-SAVING APPLIANCES, SELF INFLATING	9			P5	A13.12.
		Lighter flints, see FERROCERIUM					
		Lighter fluid,see FLAMMABLE LIQUID, N.O.S.					
	UN1057	LIGHTER REFILLS *containing flammable gas no more than 4 fluid ounces (7.22 cubic inches) and 65 grams of flammable gas*	2.1			P5	A6.10.
		Lighter replacement cartridges containing liquefied petroleum gases see, LIGHTER *refills containing flammable gas, etc.*					
		Lighters (cigarettes), with lighter fluids					FORBIDDEN
	UN1057	LIGHTERS *containing flammable gas*	2.1			P5	A6.10.
		Lighters (cigarettes), containing pyrophoric liquid					FORBIDDEN
D	NA1057	LIGHTERS, *non-pressurized containing flammable liquid*	3		II		
	UN0131	LIGHTERS, FUSE	1.4S		II	P5, A69	A5.25.
		Lime-nitrogen, see CALCIUM CYANAMIDE					
		Lime, unslaked, see CALCIUM OXIDE					
		Limonene, inactive, see DIPENTENE					
		Linoleates, see FLAMMABLE LIQUID, N.O.S.					
★	UN3163	LIQUEFIED GAS, N.O.S	2.2			P5	A6.3., A6.4.
★	UN3157	LIQUEFIED GAS OXIDIZING, N.O.S	2.2	5.1		P5	A6.3., A6.4.
★	UN3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S, *Inhalation Hazard Zone A*	2.3	8		P1, 1	A6.15.
★	UN3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S, *Inhalation Hazard Zone B*	2.3	8		P2, 2	A6.4.
★	UN3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S, *Inhalation Hazard Zone C*	2.3	8		P2, 3	A6.4.
★	UN3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S, *Inhalation Hazard Zone D*	2.3	8		P2, 4	A6.4.
★	UN3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S, *Inhalation Hazard Zone A*	2.3	2.1, 8		P1, 1	A6.15.
★	UN3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S, *Inhalation Hazard Zone B*	2.3	2.1, 8		P2, 2	A6.4.
★	UN3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S, *Inhalation Hazard Zone C*	2.3	2.1, 8		P2, 3	A6.4.
★	UN3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S, *Inhalation Hazard Zone D*	2.3	2.1, 8		P2, 4	A6.4.
★	UN3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S, *Inhalation Hazard Zone A*	2.3	2.1		P1, 1	A6.15.
★	UN3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S, *Inhalation Hazard Zone B*	2.3	2.1		P2, 2	A6.4.
★	UN3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S, *Inhalation Hazard Zone C*	2.3	2.1		P2, 3	A6.4.
★	UN3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S, *Inhalation Hazard Zone D*	2.3	2.1		P2, 4	A6.4.
★	UN3162	LIQUEFIED GAS, TOXIC, N.O.S, *Inhalation Hazard Zone A*	2.3			P1, 1	A6.15.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3162	LIQUEFIED GAS, TOXIC, N.O.S, *Inhalation Hazard Zone B*	2.3			P2, 2	A6.4.
★	UN3162	LIQUEFIED GAS, TOXIC, N.O.S, *Inhalation Hazard Zone C*	2.3			P2, 3	A6.4.
★	UN3162	LIQUEFIED GAS, TOXIC, N.O.S, *Inhalation Hazard Zone D*	2.3			P2, 4	A6.4.
★	UN3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S, *Inhalation Hazard Zone A*	2.3	5.1, 8		P1, 1	A6.15.
★	UN3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S, *Inhalation Hazard Zone B*	2.3	2.1, 8		P2, 2	A6.4.
★	UN3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S, *Inhalation Hazard Zone C*	2.3	2.1, 8		P2, 3	A6.4.
★	UN3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S, *Inhalation Hazard Zone D*	2.3	2.1, 8		P2, 4	A6.4.
★	UN3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S, *Inhalation Hazard Zone A*	2.3	5.1		P1, 1	A6.15.
★	UN3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S, *Inhalation Hazard Zone B*	2.3	5.1		P2, 2	A6.4.
★	UN3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S, *Inhalation Hazard Zone C*	2.3	5.1		P2, 3	A6.4.
★	UN3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S, *Inhalation Hazard Zone D*	2.3	5.1		P2, 4	A6.4.
	UN1058	LIQUEFIED GASES, *nonflammable charged with nitrogen, carbon dioxide or air*	2.2			P5	A6.3., A6.4.
★	UN3161	LIQUEFIED GASES, FLAMMABLE, N.O.S.	2.1			P4	A6.3., A6.4.
		Liquefied hydrocarbon gas, see HYDROCARBON GAS MIXTURE, LIQUIFIED N.O.S.					
		Liquefied natural gas, see NATURAL GAS REFRIGERATED GAS *or* METHANE GAS, REFRIGERATED LIQUID					
		Liquefied petroleum gas, see PETROLEUM GASES, LIQUEFIED					
		Liquids, other than those classified as flammable, corrosive, or toxic, charged with nitrogen, carbon, dioxide or air, see COMPRESSED GAS, N.O.S.					
		Liquor, see ALCOHOLIC BEVERAGES					
	UN1415	LITHIUM	4.3		I	P3, A7, A19, N45	A8.3.
		Lithium acetylide ethylenediamine complex, see WATER-REACTIVE SOLID, N.O.S.					
	UN2445	LITHIUM ALKYLS, LIQUID	4.2	4.3	I	P3	A8.5.
	UN3433	LITHIUM ALKYLS, SOLID	4.2				FORBIDDEN
	UN1410	LITHIUM ALUMINIUM HYDRIDE	4.3		I	P3, A19	A8.3.
	UN1411	LITHIUM ALUMINIUM HYDRIDE, ETHEREAL	4.3	3	I	P3, A2, A3, A11, N34	A8.2.
		Lithium amide, see ALKALI METAL AMIDES					
	UN1413	LITHIUM BOROHYDRIDE	4.3		I	P3, A19, N40	A8.3.
	UN2830	LITHIUM FERROSILICON	4.3		II	P5, A19	A8.3.
	UN1414	LITHIUM HYDRIDE	4.3		I	P3, A19, N40	A8.3.
	UN2805	LITHIUM HYDRIDE, FUSED SOLID	4.3		II	P5, A8, A19, A20	A8.3.
	UN2680	LITHIUM HYDROXIDE	8		II	P5	A12.3.
	UN2679	LITHIUM HYDROXIDE, SOLUTION	8		II III	P5 P5	A12.2. A12.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1471	LITHIUM HYPOCHLORITE, DRY *or* LITHIUM HYPOCHLORITE MIXTURE	5.1		II III	P5, A9, N34 P5, N34	A9.6. A9.6
		Lithium in cartridges or cartouches; see LITHIUM					
	UN3480	LITHIUM ION BATTERIES *including lithium polymer batteries*	9		II	P4, A511	A13.7.
	UN3481	LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT *including lithium polymer batteries*	9		II	P5,	A13.8.
	UN3481	LITHIUM ION BATTERIES PACKED WITH EQUIPMENT *including lithium polymer batteries*	9		II	P5, A511	A13.9.
	UN3090	LITHIUM METAL BATTERIES *including lithium alloy batteries or* LITHIUM BATTERY	9		II	P4	A13.7.
	UN3091	LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT *including lithium alloy batteries or* LITHIUM BATTERIES CONTAINED IN EQUIPMENT	9		II	P4	A13.8.
	UN3091	LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT *including lithium alloy batterie or* LITHIUM BATTERIES PACKED WITH EQUIPMENT	9		II	P4	A13.9
	UN2722	LITHIUM NITRATE	5.1		III	P5, A1	A9.6.
	UN2806	LITHIUM NITRIDE	4.3		I	P3, A19, N40	A8.3.
	UN1472	LITHIUM PEROXIDE	5.1		II	P5, A9, N34	A9.6.
		Lithium silicide, see LITHIUM SILICON					
	UN1417	LITHIUM SILICON	4.3		II	P5, A19, A20	A8.3.
		LNG, see NATURAL GAS, REFRIGERATED LIQUID *or* METHANE, REFRIGERATED LIQUID					
	UN1621	LONDON PURPLE	6.1		II	P5	A10.5.
		LPG, see PETROLEUM GASES, LIQUEFIED					
		Lye solid, see SODIUM HYDROXIDE, SOLID					
		Lye solution , see SODIUM HYDROXIDE, SOLUTIONS					
		Lythene, see PETROLEUM DISTILLATES, N.O.S.					
	UN1869	MAGNESIUM *or* MAGNESIUM ALLOYS *with more than 50% magnesium in pellets, turnings or ribbons*	4.1		III	P5, A1	A8.3.
	UN3053	MAGNESIUM ALKYLS	4.2	4.3	I	P3	A8.5.
	UN1419	MAGNESIUM ALUMINIUM PHOSPHIDE	4.3	6.1	I	P3, A19, N34, N40	A8.3.
+	UN1622	MAGNESIUM ARSENATE	6.1		II	P5	A10.5.
		Magnesium bisulfite solution, see BISULFITES AQUEOUS SOLUTIONS, N.O.S.					
	UN1473	MAGNESIUM BROMATE	5.1		II	P5, A1	A9.6.
	UN2723	MAGNESIUM CHLORATE	5.1		II	P5	A9.6.
		Magnesium chloride and chlorate mixture, see CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLID *or* CHLORATE AND MAGNESIUM CHLORIDE MIXTURE SOLUTION					
	UN2004	MAGNESIUM DIAMIDE	4.2		II	P5, A8, A19, A20	A8.3.
	UN2005	MAGNESIUM DIPHENYL	4.2		I	P3	A8.11.
		Magnesium dross, wet or hot					FORBIDDEN
	UN2853	MAGNESIUM FLUOROSILICATE	6.1		III	P5	A10.5.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2950	MAGNESIUM GRANULES, COATED, *particle size not less than 149 Microns*	4.3		III	P5, A1, A19	A8.3.
	UN2010	MAGNESIUM HYDRIDE	4.3		I	P3, A19, N40	A8.3.
	UN1474	MAGNESIUM NITRATE	5.1		III	P5, 332, A1	A9.6.
	UN1475	MAGNESIUM PERCHLORATE	5.1		II	P5	A9.6.
	UN1476	MAGNESIUM PEROXIDE	5.1		II	P5	A9.6.
	UN2011	MAGNESIUM PHOSPHIDE	4.3	6.1	I	P3, A19, N40	A8.3.
	UN1418	MAGNESIUM, POWDER *or* MAGNESIUM ALLOYS, POWDER	4.3	4.2 4.2 4.2	I II III	P3, A19 P5, A19 P5, A19	A8.3. A8.3. A8.3.
		Magnesium scrap, see MAGNESIUM *or* MAGNESIUM ALLOYS					
	UN2624	MAGNESIUM SILICIDE	4.3		II	P5, A19, A20	A8.3.
		Magnesium silicofluoride, see MAGNESIUM FLUOROSILICATE					
	UN2807	MAGNETIZED MATERIAL	9			P5	A13.11.
	UN2215	MALEIC ANHYDRIDE	8		III	P5	A12.3.
	UN2215	MALEIC ANHYDRIDE, MOLTEN	8				FORBIDDEN
		Malonic dinitrile or Malonodinitrile, see MALONONITRILE					
	UN2647	MALONONITRILE	6.1		II	P5	A10.5.
		Mancozeb (manganese, ethylenebisdithiocarbamate complex with zinc) see MANEB					
	UN2210	MANEB *or* MANEB PREPARATIONS *with not less than 60% maneb*	4.2	4.3	III	P5, A1, A19	A8.3.
	UN2968	MANEB STABILIZED *or* MANEB PREPARATIONS, STABILIZED *against self-heating*	4.3		III	P5, A1, A19	A8.3.
		Manganese ethylene-di-dithiocarbamate or Manganese ethylene-1,2-di-dithiocarbamate, see MANEB *or* MANEB, STABILIZED *or* MANEB PREPARATION, STABILIZED					
		Manganese (II) nitrate, see MANGANESE NITRATE					
	UN2724	MANGANESE NITRATE	5.1		III	P5, A1	A9.6.
	UN1330	MANGANESE RESINATE	4.1		III	P5, A1	A8.3.
		Manganous nitrate, see MANGANESE NITRATE					
		Mannitan tetranitrate					FORBIDDEN
		Mannitol hexanitrate (dry)					FORBIDDEN
	UN0133	MANNITOL HEXANITRATE, WETTED *or* NITROMANNITE, WETTED *with not less than 40% water, or mixture of alcohol and water, by mass*	1.1D		II	P4	A5.6.
		Marine pollutants, liquid, or solid, n.o.s., see ENVIRONMENTALLY HAZARDOUS SUBSTANCES LIQUID, N.O.S. *or* ENVIRONMENTALLY HAZARDOUS SUBSTANCES SOLID N.O.S.					
		Mannitol hexanitrate, wetted with less than 40% water or mixture of alcohol and water					FORBIDDEN
		Matches, block, see MATCHES, STRIKE ANYWHERE					
	UN2254	MATCHES, FUSEE	4.1		III	P4	A8.14.
	UN1944	MATCHES, SAFETY*(book, card or strike on box)*	4.1		III	P5	A8.14
	UN1331	MATCHES, STRIKE ANYWHERE	4.1		III	P4	A8.14
		Matches trick, see FIREWORKS					
	UN1945	MATCHES, WAX, VESTA	4.1		III	P5	A8.14
		Matting Acid, see SULFURIC ACID					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN3291	MEDICAL WASTE, N.O.S., CLINICAL WASTE, UNSPECIFIED, N.O.S.	6.2		II	P5, A117	A10.10.
		Medicine, n.o.s. in small inner packagings containing flammable aerosol and/or non-flammable aerosol and/or flammable liquid and/or toxic substance, n.o.s., see CONSUMER COMMODITY					
	UN3248	MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S.	3	6.1 6.1	II III	P4, P5,	A7.2. A7.2.
	UN1851	MEDICINE, LIQUID TOXIC, N.O.S.	6.1		II III	P5 P5	A10.4. A10.4.
	UN3249	MEDICINE, SOLID, TOXIC, N.O.S.	6.1		II III	P5, P5,	A10.5. A10.5.
		Memtetrahydrophthalic anhydride, see CORROSIVE LIQUIDS, N.O.S.					
		p-Mentha-1,8-diene, see DIPENTENE					
★	UN3336	MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. *or* MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
★	UN1228	MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S. *or* MERCAPTAN MIXTURES, LIQUID, FLAMMABLE, TOXIC, N.O.S.	3	6.1 6.1	II III	P4 P5	A7.2. A7.2.
★	UN3071	MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S. *or* MERCAPTAN MIXTURES, LIQUID, TOXIC, FLAMMABLE, N.O.S., *flashpoint not less than 23 degrees C*	6.1	3	II	P5, A6	A10.4.
		2-Mercaptoethanol see THIOGLYCOL					
		2-Mercaptopropionic acid, see THIOLACTIC ACID					
	UN0448	5-MERCAPTOTETRAZOL-1-ACETIC ACID	1.4C		II	P5	A5.9.
	UN1623	MERCURIC ARSENATE	6.1		II	P5	A10.5.
	UN1624	MERCURIC CHLORIDE	6.1		II	P5	A10.5.
		Mercuric compounds, see MERCURY COMPOUNDS LIQUID, N.O.S. *or* MERCURY COMPOUNDS SOLID, N.O.S.					
	UN1625	MERCURIC NITRATE	6.1		II	P5, N73	A10.5.
+	UN1626	MERCURIC POTASSIUM CYANIDE	6.1		I	P5, N74, N75	A10.5.
		Mercuric salt, see MERCURY COMPOUND, LIQUID, N.O.S. MERCURY COMPOUND SOLID, N.O.S.					
		Mercuric sulfocyanate, see MERCURY THIOCYANATE					
		Mercuric Sulfate, see MERCURY SULFATE					
		Mercurol, see MERCURY NUCLEATE					
		Mercurous azide					FORBIDDEN
		Mercurous compounds, see MERCURY COMPOUNDS LIQUID *or* SOLID, N.O.S.					
	UN1627	MERCUROUS NITRATE	6.1		II	P5	A10.5.
		Mercurous sulfate, see MERCURY SULFATE					
	UN2809	MERCURY	8		III	P5	A12.9.
	UN1629	MERCURY ACETATE	6.1		II	P5	A10.5.
		Mercury acetylide					FORBIDDEN
	UN1630	MERCURY AMMONIUM CHLORIDE	6.1		II	P5	A10.5.
★	UN2778	MERCURY BASED PESTICIDES, LIQUID, FLAMMABLE, TOXIC, *flashpoint less than 23 degrees C*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2
★	UN3012	MERCURY BASED PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3011	MERCURY BASED PESTICIDES, LIQUID, TOXIC, FLAMMABLE, *flashpoint not less than 23 degrees C*	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2777	MERCURY BASED PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN1631	MERCURY BENZOATE	6.1		II	P5	A10.5.
		Mercury bichloride, see MERCURIC CHLORIDE					
		Mercury bisulfate, see MERCURY SULFATE					
	UN1634	MERCURY BROMIDES	6.1		II	P5	A10.5.
	UN2024	MERCURY COMPOUNDS, LIQUID, N.O.S.	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
	UN2025	MERCURY COMPOUNDS, SOLID, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN2809	MERCURY CONTAINED IN MANUFACTURED ARTICLES	8		III	P5	A12.9
	UN1636	MERCURY CYANIDE	6.1		II	P5, N74, N75	A10.5.
	UN0135	MERCURY FULMINATE, WETTED *with not less than 20% water, or mixture of alcohol and water, by mass*	1.1A		II	P3, 111, 117	A5.4.
		Mercury fulminate, wetted with less than 20% water or mixture of alcohol and water					FORBIDDEN
	UN1637	MERCURY GLUCONATE	6.1		II	P5	A10.5.
	UN1638	MERCURY IODIDE, SOLUTION *or* MERCURY IODIDE, SOLID	6.1		II	P5	A10.4., A10.5.
		Mercury iodine aquabasic ammonobasic (Iodide of Millon's base)					FORBIDDEN
		Mercury Nitride					FORBIDDEN
	UN1639	MERCURY NUCLEATE	6.1		II	P5	A10.5.
	UN1640	MERCURY OLEATE	6.1		II	P5	A10.5.
	UN1641	MERCURY OXIDE	6.1		II	P5	A10.5.
	UN1642	MERCURY OXYCYANIDE, DESENSITIZED	6.1		II	P5	A10.5.
		Mercury oxycyanide, not desensitized					FORBIDDEN
	UN1643	MERCURY POTASSIUM IODIDE	6.1		II	P5	A10.5.
	UN1644	MERCURY SALICYLATE	6.1		II	P5	A10.5.
+	UN1645	MERCURY SULFATES	6.1		II	P5	A10.5.
	UN1646	MERCURY THIOCYANATE	6.1		II	P5	A10.5.
		Mercury vapour tubes, see MERCURY CONTAINED IN MANUFACTURED ARTICLES					
		Mesitylene, see 1,3,5-TRIMETHYLBENZENE					
	UN1229	MESITYL OXIDE	3		III	P5	A7.2.
★	UN3281	METAL CARBONYLS, LIQUID, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.4. A10.4. A10.4.
	UN3466	METAL CARBONYLS, SOLID, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.5 A10.5 A10.5
	UN2881	METAL CATALYST, DRY	4.2		I II III	P3, N34 P5, N34 P5, N34	A8.11. A8.11. A8.11.
	UN1378	METAL CATALYST, WETTED *with a visible excess of liquid*	4.2		II	P5, A2, A8, N34	A8.3.
		Metal catalyst, wetted without a visible excess of liquid					FORBIDDEN

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3182	METAL HYDRIDES, FLAMMABLE, N.O.S.	4.1		II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN1409	METAL HYDRIDES, WATER-REACTIVE, N.O.S.	4.3		I II	P3, A19, N34, N40 P5, A19, N34, N40	A8.3. A8.3.
	UN3089	METAL POWDER, FLAMMABLE, N.O.S.	4.1		II III	P5 P5	A8.3. A8.3.
★	UN3189	METAL POWDER, SELF-HEATING, N.O.S.	4.2		II III	P5 P5	A8.3. A8.3.
		Metal salts of methyl nitramine (dry)					FORBIDDEN
★	UN3181	METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.	4.1		II III	P4, A1 P4, A1	A8.3. A8.3.
	UN1332	METALDEHYDE	4.1		III	P5, A1	A8.3.
★	UN3208	METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.	4.3		I II III	P3, A7 P5, A7 P5, A7	A8.3. A8.3. A8.3.
★	UN3209	METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.	4.3	4.2 4.2 4.2	I II III	P3, A7 P4, A7 P5, A7	A8.3. A8.3. A8.3.
	UN2396	METHACRYLALDEHYDE, STABILIZED	3	6.1	II	P5	A7.2.
	UN2531	METHACRYLIC ACID, STABILIZED	8		III	P5	A12.2.
		Methacrylic acid, unstabilized					FORBIDDEN
+	UN3079	METHACRYLONITRILE, STABILIZED	6.1	3	I	P2, 2	A10.6.
	UN2614	METHALLYL ALCOHOL	3		III	P5	A7.2.
		Methanal, see FORMALDEHYDE SOLUTION, FLAMMABLE *or* FORMALDEHYDE SOLUTION					
		Methane and hydrogen mixtures, see HYDROGEN AND METHANE, MIXTURES, COMPRESSED					
	UN1971	METHANE, COMPRESSED *or* NATURAL GAS, COMPRESSED *(with high methane content)*	2.1			P4	A6.3., A6.5.
	UN1972	METHANE, REFRIGERATED LIQUID*(cryogenic liquid) or* NATURAL GAS, REFRIGERATED LIQUID *(cryogenic liquid, with high methane content)*	2.1			P3	A6.11.
	UN3246	METHANESULPHONYL CHLORIDE	6.1	8	I	P2, 2	A10.6.
D	UN1230	METHANOL	3		II	P4	A7.2.
+	UN1230	METHANOL	3	6.1	II	P4	A7.2.
		Methazoic acid					FORBIDDEN
		2-Methoxyethyl acetate, see ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE					
	UN2293	4-METHOXY-4-METHYLPENTAN-2-ONE	3		III	P5	A7.2.
		1-Methioxy-2-nitrobenzene or 1-Methoxy-3-nitrobenzene or 1-Methoxy-4-nitrobenzene, see NITROANISOLES, LIQUID *or* NITROANISOLES SOLID					
	UN3092	1-METHOXY-2-PROPANOL	3		III	P5	A7.2.
+	UN2605	METHOXYMETHYL ISOCYANATE	6.1	3	I	P1, 1	A10.6.
	UN1231	METHYL ACETATE	3		II	P5	A7.2.
		Methylacetylene and propadiene mixture, non-stabilized					FORBIDDEN
	UN1060	METHYL ACETYLENE AND PROPADIENE MIXTURES, STABILIZED	2.1			P4, N88	A6.3., A6.4.
		beta-Methyl acrolein, see CROTONALDEHYDE					
	UN1919	METHYL ACRYLATE, STABILIZED	3		II	P5	A7.2.
		Methyl acrylate, unstabilized					FORBIDDEN
		Methyl Alcohol, see METHANOL					
	UN1234	METHYLAL	3		II	P5	A7.2.
	UN2554	METHYLALLYL CHLORIDE	3		II	P5	A7.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Methyl amyl ketone, see AMYL METHYL KETONE					
	UN1061	METHYLAMINE, ANHYDROUS	2.1			P4, N87	A6.3., A6.4.
	UN1062	METHYL BROMIDE	2.3			P2, 3, N86	A6.16.
	UN1647	METHYL BROMIDE AND ETHYLENE DIBROMIDE MIXTURES, LIQUID	6.1		I	P2, 2, N65	A10.6.
	UN2643	METHYL BROMOACETATE	6.1		II	P5	A10.4.
	UN3371	2-METHYLBUTANAL	3		II	P5	A7.2.
	UN2397	3-METHYLBUTAN-2-ONE	3		II	P5	A7.2.
	UN2459	2-METHYL-1-BUTENE	3		I	P3	A7.2.
	UN2460	2-METHYL-2-BUTENE	3		II	P5	A7.2.
	UN2561	3-METHYL-1-BUTENE	3		I	P3	A7.2.
	UN2945	N-METHYLBUTYLAMINE	3	8	II	P4	A7.2.
	UN2398	METHYL-TERT-BUTYL ETHER	3		II	P5	A7.2.
	UN1237	METHYL BUTYRATE	3		II	P5	A7.2.
	UN1063	METHYL CHLORIDE *or* REFRIGERANT GAS R40	2.1			P4, N86	A6.3., A6.4.
		Methyl chloride and chloropicrin mixtures, see CHLOROPICRIN AND METHYL CHLORIDE MIXTURES					
	UN1912	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	2.1			P4, N86	A6.3., A6.4.
	UN2295	METHYL CHLOROACETATE	6.1	3	I	P5	A10.4.
		Methyl chlorocarbonate, see METHYL CHLOROFORMATE					
		Methyl chloroform, see 1,1,1-TRICHLOROETHANE					
	UN1238	METHYL CHLOROFORMATE	6.1	3, 8	I	P1, 1, N34	A10.6.
		Methyl bromide and chloropicrin mixtures see CHLOROPICRIN AND METHYL BROMIDE MIXTURES					
	UN1239	METHYL CHLOROMETHYL ETHER	6.1	3	I	P1, 1	A10.6.
		Methyl-alpha-chloropropionate, see METHYL 2-CHLOROPROPIONATE					
	UN2933	METHYL-2-CHLOROPROPIONATE	3		III	P5	A7.2.
	UN2534	METHYLCHLOROSILANE	2.3	2.1, 8		P2, 2, A2, A3, A7, N34	A6.19.
		Methyl Cyanide, see ACETONITRILE					
	UN2296	METHYLCYCLOHEXANE	3		II	P5	A7.2.
	UN2617	METHYLCYCLOHEXANOLS, *flammable*	3		III	P5	A7.2.
	UN2297	METHYLCYCLOHEXANONE	3		III	P5	A7.2.
	UN2298	METHYLCYCLOPENTANE	3		II	P5	A7.2.
	UN2299	METHYL DICHLOROACETATE	6.1		III	P5	A10.4.
		Methyldichloroarsine					FORBIDDEN
D	NA1556	METHYLDICHLOROARSINE	6.1		I	P2, 2	A10.2
	UN1242	METHYLDICHLOROSILANE	4.3	3, 8	I	P3, A2, A3, A7, N34	A8.2.
		Methylene bromide, see DIBROMETHANE					
		Methylene chloride, see DICHLOROMETHANE					
		Methylene chloride and methyl chloride mixture, see METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE					
		Methylene cyanide, see MALONONITRILE					
		p,p'-Methylene dianiline, see 4,4'-DIAMINODIPHENYLMETHANE					
		Methylene dibromide, see DIBROMOMETHANE					
		2,2-methylene-di-(3,4,6-trichlorophenol), see HEXACHLOROPHENE					
		Methylene glycol dinitrate					FORBIDDEN
		Methyl ethyl ether, see ETHYL METHYL ETHER					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1193	METHYL ETHYL KETONE, *or* ETHYL METHYL KETONE	3		II	P5	A7.2.
		Methyl ethyl ketone peroxide(s) more than 50%					FORBIDDEN
		Methyl ethyl ketone peroxide(s), not more than 52% when with 48% or more diluent type A					FORBIDDEN
	UN2300	2-METHYL-5-ETHYLPYRIDINE	6.1		III	P5	A10.4.
	UN2454	METHYL FLUORIDE *or* REFRIGERANT GAS R41	2.1			P4	A6.3., A6.4.
	UN1243	METHYL FORMATE	3		I	P3	A7.2.
	UN2301	2-METHYLFURAN	3		II	P5	A7.2.
		a-Methylglucoside Tetranitrate					FORBIDDEN
		a-Methylglycerol Trinitrate					FORBIDDEN
		Methyl glycol, see ETHYLENE GLYCOL MONOMETHYL ETHER					
		Methyl glycol acetate, see ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE					
	UN3023	2-METHYL-2-HEPTANETHIOL	6.1	3	I	P2, 2	A10.6.
	UN2302	5-METHYLHEXAN-2-ONE	3		III	P5	A7.2.
		Methyl hydrate, see METHANOL					
	UN1244	METHYLHYDRAZINE	6.1	3, 8	I	P1, 1, N34	A10.6.
		Methyl hydroxide, see METHANOL					
		1-Methylimidazole, see CORROSIVE LIQUID, N.O.S.					
	UN2644	METHYL IODIDE	6.1		I	P2, 2	A10.6.
		Methyl isoamyl ketone, see 5-METHYLHEXAN-2-ONE					
	UN2053	METHYL ISOBUTYL CARBINOL	3		III	P5	A7.2.
	UN1245	METHYL ISOBUTYL KETONE	3		II	P5	A7.2.
		Methyl isobutyl ketone peroxide, in solution with more than 9% by mass active oxygen					FORBIDDEN
	UN2480	METHYL ISOCYANATE	6.1	3	I	P1, 1	A10.6.
	UN1246	METHYL ISOPROPENYL KETONE, STABILIZED	3		II	P5	A7.2.
		Methyl isopropenyl ketone, unstabilized					FORBIDDEN
	UN2477	METHYL ISOTHIOCYANATE	6.1	3	I	P2, 2	A10.6.
	UN2400	METHYL ISOVALERATE	3		II	P5	A7.2.
	UN1928	METHYL MAGNESIUM BROMIDE IN ETHYL ETHER	4.3	3	I	P3	A8.2.
	UN1064	METHYL MERCAPTAN	2.3	2.1		P2, 3, N89	A6.4.
		Methyl mercaptopropionaldehyde, see 4-THIAPENTANAL					
	UN1247	METHYL METHACRYLATE MONOMER, STABILIZED	3		II	P5	A7.2.
		Methyl methacrylate monomer, unstabilized					FORBIDDEN
	UN2535	4-METHYLMORPHOLINE *or* N-METHYLMORPHOLINE	3	8	II	P5	A7.2.
		Methyl nitramine (dry), metal salts of					FORBIDDEN
		Methyl nitrate					FORBIDDEN
		Methyl nitrite					FORBIDDEN
		Methyl norbornene dicarboxylic anhydride, see CORROSIVE LIQUID N.O.S.					
	UN2606	METHYL ORTHOSILICATE	6.1	3	I	P2, 2	A10.6.
		Methyl oxide, see DIMETHYL ETHER					
D	NA9206	METHYL PHOSPHONIC DICHLORIDE	6.1	8	I	P2, 2, A3 N34, N43	A10.6.
	UN2461	METHYLPENTADIENES	3		II	P5	A7.2.
		Methylpentanes, see HEXANES					
		4-methylpentan-2-ol, see METHYL ISOBUTYL CARBINOL					
	UN2560	2-METHYLPENTAN-2-OL	3		III	P5	A7.2.
		3-Methyl-2-penten-4-one-ol, see 1-PENTOL					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2437	METHYLPHENYLDICHLOROSILANE	8		II	P5	A12.2.
		2-Methyl-2-phenylpropane, see BUTYLBENZENES					
		Methyl phosphonothioic dichloride, anhydrous, see CORROSIVE LIQUID, N.O.S					
		Methyl phosphonous dichloride, see PYROPHORIC LIQUID, ORGANIC, N.O.S.					
		Methyl picric acid (heavy metal salts of)					FORBIDDEN
D	NA2845	METHYL PHOSPHONOUS DICHLORIDE, *pyrophoric liquid*	6.1	4.2	I	P2, 2	A10.6.
	UN2399	1-METHYLPIPERIDINE	3	8	II	P4	A7.2.
		2-Methyl-2-propanol, see BUTANOLS					
	UN1248	METHYL PROPIONATE	3		II	P5	A7.2.
		Methyl					
	UN2612	METHYL PROPYL ETHER	3		II	P5	A7.2.
	UN1249	METHYL PROPYL KETONE	3		II	P5	A7.2.
		Methyl pyridines, see PICOLINES					
		alpha- Methylstyrene, see ISOPROPENYLBENZENE					
		Methylstyrene, stabilized, see VINYLTOULENES, STABILIZED					
		Methyl sulfate, see DIMETHYL SULFATE					
		Methyl sulfide, see DIMETHYL SULFIDE					
	UN2536	METHYLTETRAHYDROFURAN	3		II	P5	A7.2.
	UN2533	METHYL TRICHLOROACETATE	6.1		III	P5	A10.4.
	UN1250	METHYLTRICHLOROSILANE	3	8	II	P3, A7, N34	A7.2.
		Methyl trimethylol methane trinitrate					FORBIDDEN
	UN2367	ALPHA-METHYLVALERALDEHYDE	3		II	P5	A7.2.
		Methyl vinyl benzene, stabilized, see VINYLTOULENES, STABILIZED					
	UN1251	METHYL VINYL KETONE, STABILIZED	6.1	3, 8	I	P1, 1	A10.6.
		Metramine, see HEXAMETHYLENETETRAMINE					
		MIBC, see METHYL ISOBUTYL CARBINOL					
	UN1235	METHYLAMINE, AQUEOUS SOLUTION	3	8	II	P4	A7.2.
		Methylamine dinitramine and dry salts thereof					FORBIDDEN
		Methylamine nitroform					FORBIDDEN
		Methylamine perchlorate (dry)					FORBIDDEN
	UN1233	METHYLAMYL ACETATE	3		III	P5	A7.2.
	UN2294	N-METHYLANILINE	6.1		III	P5	A10.4.
		Methylated spirit, see ALCOHOLS FLAMMABLE, TOXIC, N.O.S. *or* ALCOHOLS, N.O.S.					
	UN2938	METHYL BENZOATE	6.1		III	P5	A10.4.
	UN2937	ALPHA-METHYLBENZYL ALCOHOL, LIQUID	6.1		III	P5	A10.4.
	UN3438	ALPHA-METHYLBENZYL ALCOHOL, SOLID	6.1		III	P5	A10.5
		Mine rescue equipment containing carbon dioxide, see CARBON DIOXIDE					
	UN0137	MINES *with bursting charge*	1.1D		II	P4	A5.12.
	UN0136	MINES *with bursting charge*	1.1F		II	P4	A5.12.
	UN0138	MINES *with bursting charge*	1.2D		II	P4	A5.12.
	UN0294	MINES *with bursting charge*	1.2F		II	P4	A5.12.
		Mirbane, see NITROBENZENE					
		Missiles guided, see ROCKETS *or* ROCKETS, LIQUID FUELLED					
		Mixed acid, see NITRATING ACID, MIXTURES, *etc.*					

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Mobility aids, see BATTERY POWERED EQUIPMENT *or* BATTERY POWERED VEHICLE					
D	NA0276	MODEL ROCKET MOTOR	1.4C		II	P4, 62	A5.12.
D	NA0323	MODEL ROCKET MOTOR	1.4S		II	P4, 62	A5.12.
	UN2508	MOLYBDENUM PENTACHLORIDE	8		III	P5	A12.3.
		Monochloroacetic acid, see CHLOROACETIC ACID SOLUTION *or* CHLOROACETIC ACID SOLID					
		Monochloroacetone (unstabilized)					FORBIDDEN
		Monochlorobenzene, see CHLOROBENZENE					
		Monochlorodifluoromethane, see CHLORODIFLUOROMETHANE					
		Monochlorodifluoromethane and monochloropentafluoroethane, see CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROMETHANE MIXTURE					
		Monochlorodifluoromonobromomethane, see CHLORODIFLUOROBROMOMETHANE					
		Monochloropentafluoroethane and monochlorodifluoromethane mixture, see CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE					
		Monochloroethylene, see VINYL CHLORIDE, STABILIZED					
		Monoethanolamine, see ETHANOLAMINE, SOLUTIONS					
		Monoethylamine, see ETHYLAMINE					
	UN2054	MORPHOLINE	8	3	I	P5, A6	A12.2.
		Morpholine, aqueous, mixture, see CORROSIVE LIQUID, N.O.S.					
+	UN1649	MOTOR FUEL ANTI-KNOCK MIXTURE	6.1		I	P3, 14	A10.4.
	UN1649	MOTOR FUEL ANTI-KNOCK MIXTURE, FLAMMABLE	6.1	3	I	P3, 14	A10.4.
	UN1203	MOTOR SPIRIT *or* GASOLINE *or* PETROL	3		II	P5	A7.2.
		Motorcycle, see VEHICLE, FLAMMABLE GAS POWERED *or* VEHICLE, FLAMMABLE LIQUID POWERED					
		Muriatic acid, see HYDROCHLORIC ACID SOLUTION					
	UN2956	MUSK XYLENE *or* 5-TERT-BUTYL-2,4,6-TRINITO-M-XYLENE	4.1		III	P5	A8.4.
		Mysorite, see BROWN ASBESTOS					
		Naphtha, see PETROLEUM DISTILLATE N.O.S					
	UN1334	NAPHTHALENE, CRUDE *or* REFINED	4.1		III	P5, A1	A8.3.
		Naphthalene diozonide					FORBIDDEN
	UN2304	NAPHTHALENE, MOLTEN	4.1		III		FORBIDDEN
		Naphtha petroleum, see PETROLEUM DISTILLATES, N.O.S.					
		Naphtha solvent, see PETROLEUM PRODUCTS, N.O.S.					
		Naphthenates, see FLAMMABLE LIQUID, N.O.S.					
		Naphthene, see CYCLOHEXANE					
	UN2077	ALPHA-NAPHTHYLAMINE	6.1		III	P5	A10.5.
		Naphthy amineperchlorate					FORBIDDEN
	UN1650	BETA-NAPHTHYLAMINE, SOLID	6.1		II	P5	A10.5.
	UN3411	BETA- NAPHTHYLAMINE SOLUTION	6.1		II III	P5 P5	A10.4 A10.4
		1-Naphthylthiourea, see NAPHTHYLTHIOUREA					

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(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1651	NAPHTHYLTHIOUREA	6.1		II	P5	A10.5.
	UN1652	NAPHTHYLUREA	6.1		II	P5	A10.5.
	UN1971	NATURAL GAS, COMPRESSED	2.1			P4	A6.3., A6.5.
		Natural gasoline, see MOTOR SPIRIT *or* GASOLINE *or* PETROL					
	UN1972	NATURAL GAS, REFRIGERATED LIQUID, *with high methane content (cryogenic liquid)*	2.1			P3	A6.11.
		Natural gases (with high methane content) see METHANE, *etc.*					
		Neohexane, see HEXANES					
	UN1065	NEON, COMPRESSED	2.2			P5	A6.3., A6.5.
		Neon, liquid, non-pressurized					FORBIDDEN
	UN1913	NEON, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2			P4	A6.11.
		Neopentane, see 2,2-DIMETHYLPROPANE					
		Neothyl, see METHYL PROPYL ETHER					
		Nickel arsenate, solid, see ARSENIC COMPOUND, SOLID, N.O.S.					
	UN1259	NICKEL CARBONYL	6.1	3	I		FORBIDDEN
	UN1653	NICKEL CYANIDE	6.1		II	P5, N74, N75	A10.5.
		Nickel (II) cyanide, see NICKEL CYANIDE					
		Nickel (II) nitrate, see NICKEL NITRATE					
		Nickel (II) nitrite, see NICKEL NITRITE					
	UN2725	NICKEL NITRATE	5.1		III	P5, A1	A9.6.
	UN2726	NICKEL NITRITE	5.1		III	P5, A1	A9.6.
		Nickelous nitrate, see NICKEL NITRATE					
		Nickelous nitrite, see NICKEL NITRITE					
		Nickel Picrate					FORBIDDEN
		Nickel tetracarbonyl, see NICKEL CARBONYL					
	UN1654	NICOTINE	6.1		II	P5	A10.4.
★	UN3144	NICOTINE COMPOUNDS, LIQUID, N.O.S. *or* NICOTINE PREPARATIONS, LIQUID, N.O.S.	6.1		I II III	P3, A4 P5 P5	A10.4. A10.4. A10.4.
★	UN1655	NICOTINE COMPOUNDS, SOLID, N.O. S. *or* NICOTINE PREPARATIONS, SOLID, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN1656	NICOTINE HYDROCHLORIDE LIQUID *or* NICOTINE HYDROCHLORIDE SOLUTION	6.1		II	P5	A10.4.
	UN3444	NICOTINE HYDROCHLORIDE, SOLID	6.1		II	P5	A10.6
		NICOTINE PREPARATION, LIQUID, N.O.S. *see* NICOTINE COMPOUNDS, LIQUID, N.O.S.					
		NICOTINE PREPARATION, SOLID, N.O.S. *see* NICOTINE COMPOUNDS, SOLID, N.O.S.					
	UN1657	NICOTINE SALICYLATE	6.1		II	P5	A10.5.
	UN3445	NICOTINE SULFATE, SOLID	6.1		II	P5	A10.6
	UN1658	NICOTINE SULFATE, SOLUTION	6.1		II	P5	A10.4
	UN1659	NICOTINE TARTRATE	6.1		II	P5	A10.5.
		Nitrated Paper (unstable)					FORBIDDEN
	UN3218	NITRATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1		II III	P5 P5	A9.5. A9.5.
	UN1477	NITRATES, INORGANIC, N.O.S.	5.1		II III	P5 P5	A9.6. A9.6.
		Nitrates of diazonium compounds					FORBIDDEN
	UN1796	NITRATING ACID MIXTURES *with not more than 50% nitric acid*	8		II	P4, A7	A12.10.
	UN1796	NITRATING ACID MIXTURES with *50% or more nitric acid*	8	5.1	I	P3, A7	A12.10.
	UN1826	NITRATING ACID MIXTURES, SPENT *with not more than 50% nitric acid*	8		II	P4, A7	A12.10.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1826	NITRATING ACID MIXTURES, SPENT *with 50% or more nitric acid*	8	5.1	I	P3, A7	A12.10.
		Nitrating acid mixture, spent, all concentrations, unstable					FORBIDDEN
	UN2031	NITRIC ACID *other than red fuming, with more than 20% but less than 65% nitric acid*	8		II	P4, A6	A12.10.
	UN2031	NITRIC ACID *other than red fuming, with at least 65% but with 70% or less nitric acid*	8	5.1	II	P4, A6	A12.10.
	UN2031	NITRIC ACID, *other than red fuming, with not more than20% nitric acid*	8		II	P4, A6	A12.10.
	UN2031	NITRIC ACID , *other than red fuming, with more than 70% nitric acid*	8	5.1	I	P3, A3	A12.10.
+	UN2032	NITRIC ACID, RED FUMING	8	5.1, 6.1	I	P2, 2	A12.11.
	UN1975	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURES *or* NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURES	2.3	5.1, 8			FORBIDDEN
	UN1660	NITRIC OXIDE, COMPRESSED	2.3	5.1, 8		P1, 1	A6.19.
★	UN3273	NITRILES, FLAMMABLE, TOXIC, N.O.S.	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3275	NITRILES, TOXIC, FLAMMABLE, N.O.S.	6.1	3 3	I II	P3, 5 P4	A10.4. A10.4.
★	UN3276	NITRILES, TOXIC, LIQUID, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.4. A10.4. A10.4.
★	UN3439	NITRILES, TOXIC, SOLID, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.5. A10.5. A10.5.
★	UN3219	NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		II III	P5 P5	A9.5. A9.5.
★	UN2627	NITRITES, INORGANIC, N.O.S.	5.1		II	P5, 33	A9.6.
		N-Nitroaniline					FORBIDDEN
+	UN1661	NITROANILINES *(o-;m-;p-;)*	6.1		II	P5	A10.5.
	UN2730	NITROANISOLES, LIQUID	6.1		III	P5	A10.4.
	UN3458	NITROANISOLES, SOLID	6.1		III	P5	A10.5.
+	UN1662	NITROBENZENE	6.1		II	P5	A10.4.
		Nitrobenzene bromide, see NITROBROMOBENZENES, LIQUID *or* NITROBROMOBENZENES, SOLID					
		m-Nitrobenzene diazonium perchlorate					FORBIDDEN
	UN2305	NITROBENZENESULFONIC ACID	8		II	P5	A12.2.
		Nitrobenzol, see NITROBENZENE					
	UN0385	5-NITROBENZOTRIAZOL	1.1D		II	P4	A5.6.
	UN2306	NITROBENZOTRIFLUORIDES, LIQUID	6.1		II	P5	A10.4.
	UN3431	NITROBENZOTRIFLUORIDES, SOLID	6.1		II	P5	A10.5
	UN2732	NITROBROMOBENZENES, LIQUID	6.1		III	P5	A10.4.
	UN3459	NITROBROMOBENZENES, SOLID	6.1		III	P5	A10.5.
	UN0340	NITROCELLULOSE, *dry or wetted with less than 25% water (or alcohol), by mass*	1.1D		II	P4	A5.6.
	UN0341	NITROCELLULOSE, *unmodified or plasticized with less than 18% plasticizing substance, by mass*	1.1D		II	P4	A5.6.
	UN3270	NITROCELLULOSE MEMBRANE FILTERS	4.1		II	P5, 43, A1	A8.3.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2557	NITROCELLULOSE, MIXTURE WITHOUT PLASTICIZER , WITHOUT PIGMENT *with 12.6% or less nitrogen, by dry mass, or* NITROCELLULOSE, MIXTURE WITHOUT PLASTICIZER, WITH PIGMENT *with 12.6% or less nitrogen, by dry mass, or* NITROCELLULOSE, MIXTURE WITH PLASTICIZER, WITHOUT PIGMENT *with 12.6% or less nitrogen, by dry mass, or* NITROCELLULOSE, MIXTURE WITH PLASTICIZER, WITH PIGMENT *with 12.6% or less nitrogen, by dry mass*	4.1		II	P5, 44	A8.3.
	UN0343	NITROCELLULOSE, PLASTICIZED *with not less than 18% plasticizing substance, by mass*	1.3C		II	P4	A5.5.
	UN2059	NITROCELLULOSE SOLUTION, FLAMMABLE *with not more than 12.6% nitrogen, by mass, and not more than 55% nitrocellulose*	3		I II III	P4, 198 P5, 198 P5, 198	A7.2 A7.2. A7.2.
	UN0342	NITROCELLULOSE, WETTED *with 25% or more alcohol, by mass*	1.3C		II	P4	A5.9.
	UN2556	NITROCELLULOSE WITH ALCOHOL *25% or more alcohol by mass, and 12.6% or less nitrogen, by dry mass*	4.1		II	P5	A8.3.
	UN2555	NITROCELLULOSE WITH WATER *with not less than 25% water by mass*	4.1		II	P5	A8.3.
		Nitrochlorobenzene, see CHLORONITROBENZENES SOLID *or* CHLORONITROBENZENES LIQUID					
	UN2307	3-NITRO-4-CHLOROBENZOTRIFLUORIDE	6.1		II	P5	A10.4.
		Nitrochloroform, see CHLOROPICRIN					
	UN3434	NITROCRESOLS, LIQUID	6.1		III	P5	A10.4.
	UN2446	NITROCRESOLS, SOLID	6.1		III	P5	A10.5.
		6-Nitro-4-diazotoluene-3-sulfonic acid (dry)					FORBIDDEN
		Nitro isobutene triol trinitrate					FORBIDDEN
		N-Nitro-N-methylglycolamide nitrate					FORBIDDEN
		2-Nitro-2-methylpropanol nitrate					FORBIDDEN
	UN2842	NITROETHANE	3		III	P5	A7.2.
		Nitroethyl nitrate					FORBIDDEN
		Nitroethylene polymer					FORBIDDEN
	UN1066	NITROGEN, COMPRESSED	2.2			P5	A6.3., A6.5.
	UN1067	NITROGEN DIOXIDE	2.3	5.1, 8			FORBIDDEN
		Nitrogen fertilizer solution, see FERTILIZER AMMONIATING SOLUTION, *etc.*					
		Nitrogen, mixtures with rare gases, see RARE GASES AND NITROGEN MIXTURES					
		Nitrogen monoxide, see NITROUS OXIDE					
		Nitrogen peroxide, see DINITROGEN TETROXIDE, LIQUEFIED					
	UN1977	NITROGEN, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2			P4 , 346	A6.11.
		Nitrogen tetroxide and nitric oxide mixtures, see NITRIC OXIDE AND NITROGEN TETROXIDE MIXTURES					
		Nitrogen tetroxide, see DINITROGEN TETROXIDE					
		Nitrogen trichloride					FORBIDDEN
	UN2451	NITROGEN TRIFLUORIDE	2.2	5.1		P4	A6.5.
		Nitrogen triiodide					FORBIDDEN
		Nitrogen triiodide monoamine					FORBIDDEN
	UN2421	NITROGEN TRIOXIDE	2.3	5.1, 8			FORBIDDEN

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN0143	NITROGLYCERIN, DESENSITIZED *with not less than 40% nonvolatile water insoluble phlegmatizer, by mass*	1.1D	6.1	II	P4	A5.10.
		Nitroglycerin, desensitized, with less than 40% phlegmatizer, by weight					FORBIDDEN
		Nitroglycerin, liquid, not desensitized					
★	UN3343	NITROGLYCERIN, MIXTURE, DESENSITIZED LIQUID, FLAMMABLE, N.O.S., *with less than 30% Nitroglycerin by mass*	3			P5	A8.4.
★	UN3357	NITROGLYCERIN, MIXTURE, DESENSITIZED LIQUID, N.O.S., *with less than 30% Nitroglycerin by mass*	3		II	P5	A8.4.
★	UN3319	NITROGLYCERIN, MIXTURE, DESENSITIZED SOLID, N.O.S., *with more than 2% but not more than 10% Nitroglycerin by mass*	4.1		II	P4	A8.4.
		Nitroglycerin, liquid, not desensitized					FORBIDDEN
	UN0144	NITROGLYCERIN, SOLUTION IN ALCOHOL *with more than 1%, but not more than 10% nitroglycerin*	1.1D		II	P4	A5.10.
	UN1204	NITROGLYCERIN SOLUTION IN ALCOHOL, *with not more than 1% nitroglycerin*	3		II	P3, N34	A7.2.
	UN3064	NITROGLYCERIN, SOLUTION IN ALCOHOL, *with more than 1%, but not more than 5% nitroglycerin*	3		II	P3, N8	A7.2.
	UN0282	NITROGUANIDINE *or* PICRITE, *dry or wetted with less than 20% water, by mass*	1.1D		II	P4	A5.6.
		Nitroguanidine nitrate					FORBIDDEN
	UN1336	NITROGUANIDINE WETTED, *or* PICRITE WETTED *with not less than 20% water, by mass*	4.1		I	P4, 23, A8, A19, A20, N41	A8.3.
		1-Nitro hydantoin					FORBIDDEN
	UN1798	NITROHYDROCHLORIC ACID	8		I	P3, A3, N41	A12.2.
		Nitro isobutene triol trinitrate					FORBIDDEN
		Nitromannite (dry)					FORBIDDEN
	UN0133	NITROMANNITE, WETTED *or* MANNITOL HEXANITRATE, WETTED *with 40% or more water, or mixture of alcohol and water, by weight*	1.1D		II	P4	A5.6.
	UN1261	NITROMETHANE	3		II	P5	A7.2.
		N-Nitro-N-methylglycolamide nitrate					FORBIDDEN
		2-Nitro-2-methylpropanol nitrate					FORBIDDEN
		Nitromuriatic acid; see NITROHYDROCHLORIC ACID					
	UN2538	NITRONAPHTHALENE	4.1		III	P5, A1	A8.3.
	UN3376	4-NITROPHENYLHYDRAZINE *with 30% or more water, by mass*	4.1		I	P4, 162, A8, A19, A20, N41	A8.3
+	UN1663	NITROPHENOLS *(o-,m-,p-,)*	6.1		III	P5	A10.5.
		m-Nitrophenyldinitro methane					FORBIDDEN
	UN2608	NITROPROPANES	3		III	P5	A7.2.
	UN1369	P-NITROSODIMETHYLANILINE	4.2		II	P5, A19, A20, N34	A8.3.
	UN0146	NITROSTARCH, *dry or wetted with less than 20% water, by mass*	1.1D		II	P4	A5.6.
	UN1337	NITROSTARCH, WETTED *with not less than 20% water by mass*	4.1		I	P4, 23, A8, A19, A20, N41	A8.3.
		Nitrosugars (dry)					FORBIDDEN
	UN1069	NITROSYL CHLORIDE	2.3	8		P2, 3	A6.4.
	UN2308	NITROSYLSULFURIC ACID, LIQUID	8		II	P5, A3, A6, A7, N34	A12.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN3456	NITROSYLSULFURIC ACID, SOLID	8		II	P5, A3, A6, A7, N34	A12.3.
	UN1664	NITROTOLUENES, LIQUID	6.1		II	P5	A10.4.
	UN3446	NITROTOLUENES, SOLID	6.1		II	P5	A10.6
	UN2660	NITROTOLUIDINES (MONO)	6.1		III	P5	A10.5.
	UN0490	NITROTRIAZOLONE *or* NTO	1.1D		II	P4	A5.6.
		Nitrotrichloromethane, see CHLOROPICRIN					
	UN0147	NITRO UREA	1.1D		II	P4	A5.6.
		Nitrous ether, see ETHYL NITRITE SOLUTION					
	UN1070	NITROUS OXIDE	2.2	5.1		P5	A6.3., A6.4.
	UN2201	NITROUS OXIDE, REFRIGERATED LIQUID	2.2	5.1		P4	A6.4.
	UN1665	NITROXYLENES, LIQUID	6.1		II	P5	A10.4.
	UN3447	NITROXYLENES, SOLID	6.1		II	P5	A10.5
		Nitroxylol, see NITROXYLENES NONANES					
		Non-activated carbon or Non-activated charcoal, see CARBON					
	UN1920	NONANES	3		III	P5	A7.2.
		Nonflammable gas, n.o.s., see COMPRESSED GAS, TOXIC *or* LIQUEFIED GAS , TOXIC, N.O.S.					
		Non-liquefied gases, see COMPRESSED GAS TOXIC, FLAMMABLE, N.O.S., COMPRESSED GAS, FLAMMABLE, N.O.S., COMPRESSED GAS, TOXIC, N.O.S., COMPRESSED GAS, N.O.S., COMPRESSED GAS, OXIDIZING, N.O.S., COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S., COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.					
		Non-liquefied hydrocarbon gas, see HYDROCARBON GAS, MIXTURE, COMPRESSED, N.O.S.					
	UN1799	NONYLTRICHLOROSILANE	8		II	P4, A7, N34	A12.2.
	UN2251	2,5-NORBORNADIENE, STABILIZED	3		II	P5	P7.3
		Norhausen acid, see SULFURIC ACID, FUMING, *etc.*					
		Normal propyl alcohol, normal					
	UN0490	NTO	1.1D		II	P4	A5.6.
	UN1800	OCTADECYLTRICHLOROSILANE	8		II	P4, A7, N34	A12.2.
	UN2309	OCTADIENE	3		II	P5	A7.2.
		1,7-Octadiene-3,5-diyne-1,8-dimethoxy-9-octadecyn oic acid					FORBIDDEN
	UN2422	OCTAFLUOROBUT-2-ENE *or* REFRIGERANT GAS R1318	2.2			P5	A6.4.
	UN1976	OCTAFLUOROCYCLOBUTANE *or* REFRIGERANT GAS RC318	2.2			P5	A6.4.
	UN2424	OCTAFLUOROPROPANE *or* REFRIGERANT GAS R218	2.2			P5	A6.4.
	UN1262	OCTANES	3		II	P5	A7.2.
		Octogen, etc., see CYCLOTETRAMETHYLENE TETRANITRAMINE, *etc.*					
	UN0484	OCTOGEN, DESENSITIZED	1.1D		II	P4	A5.6.
		Octogen (dry or unphlegmatized)					FORBIDDEN
	UN0226	OCTOGEN, WETTED *with not less than 15% water, by mass*	1.1D		II	P4	A5.6.
	UN0266	OCTOLITE *or* OCTOL *dry or wetted with less than 15% water by mass*	1.1D		II	P4	A5.6.
	UN0496	OCTONAL	1.1D		II	P4	A5.7.
	UN1191	OCTYL ALDEHYDES	3		III	P5	A7.2.
		Tert-Octyl Mercaptan, see 2-METHYL-2-HEPTANETHIOL					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1801	OCTYLTRICHLOROSILANE	8		II	P4, A7, N34	A12.2.
		Oenanthol, see n-HEPTALDEHYDE					
	UN1071	OIL GAS, COMPRESSED	2.3	2.1		P2, 6	A6.4.
		Oil well sampling device, charged, see COMPRESSED GAS, FLAMMABLE GAS, N.O.S. *or* LIQUEFIED GAS, FLAMMABLE, N.O.S.					
		Oleum, see SULFURIC ACID, FUMING					
		Organic Peroxide Type A, Liquid or Solid					FORBIDDEN
		Organic peroxide type B, liquid					FORBIDDEN
		Organic peroxide type B, liquid, temperature controlled					FORBIDDEN
		Organic peroxide, type B, solid					FORBIDDEN
		Organic peroxide, type B, solid, temperature controlled					FORBIDDEN
★	UN3101	ORGANIC PEROXIDE TYPE B, LIQUID	5.2	1	II	P3, 53	Table A9.2.5
★	UN3111	ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED	5.2	1	II	P3, 53	Table A9.2.5
★	UN3102	ORGANIC PEROXIDE TYPE B, SOLID	5.2	1	II	P3, 53	SEE BELOW BY TECHNICAL NAME
		tert-Butyl Monoperoxymaneate					Table A9.3.5
		3-Choloroperoxybenzoic Acid					Table A9.3.1
		Dibenzoyl Peroxide > 52 < 100					Table A9.3.2
		Dibenzoyl Peroxide > 78, < 94					Table A9.3.6
		Di-4-Chlorobenzoyl Peroxide					Table A9.3.5
		Di-2,4-Dichlorobenzoyl Peroxide					Table A9.3.5
		2,2-Dihydroperoxypropane					Table A9.3.5
		2,5-Dimethyl -2,5-di-(Benzoyl-Peroxy) Hexane					Table A9.3.5
		Di-(2 Phenoxyethyl) Peroxydicarbonate					Table A9.3.5
		Disuccinic Acid Peroxide					Table A9.3.4
		3,3,6,6,9,9,-Hexamethyl-1,2,4,5-Tetraoxa-cylcononane					Table A9.3.4
★	UN3112	ORGANIC PEROXIDE TYPE B, SOLID, TEMPERATURE CONTROLLED	5.2	1	II	P3, 53	SEE BELOW BY TECHNICAL NAME
		Acetyl Cylcohexanesulphonyl Peroxide					Table A9.3.4
		Dibenzyl Peroxydicarbonate					Table A9.3.5
		Dicyclohexyl Peroxydicarbonate					Table A9.3.5
		Diisopropyl Peroxydicarbonate					Table A9.3.2
		Di-(2-Methylbenzoyl) Peroxide					Table A9.3.5
★	UN3103	ORGANIC PEROXIDE TYPE C, LIQUID	5.2		II	P5	SEE BELOW BY TECHNICAL NAME
		tert-Amyl peroxybenzoate					Table A9.2.7
		n-Butyl-4,4-di-(Tertcutylperoxy)-Valerate					Table A9.2.5
		tert-Butyl Hydroperoxide					Table A9.2.5
		tert-Butyl Hydroperoxide and di-tert-Butyl Peroxide					Table A9.2.5
		tert-Butyl Monoperoxymaneate					Table A9.2.6
		tert-Butyl Peroxyacetate					Table A9.2.6
		tert-Butyl Peroxybenzoate					Table A9.2.5
		tert-Butylperoxy Isopropyl Carbonate					Table A9.2.5
		2,2-Di-(tert-Butylperoxy) Butane					Table A9.2.6
		1,1-Di-(tert-Butylperoxy) Cyclohexane					Table A9.2.5
		2,5-Dimethyl-2,5-Di-(tert-Butyl-Peroxy)Hexane -3					Table A9.2.5
		Ethyl-3,3-Di-(tert-Butylperoxy)-Butyrate					Table A9.2.5
		Organic Peroxide, Liquid, Sample					Table A9.2.2

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3113	ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED	5.2		II	P3	SEE BELOW BY TECHNICAL NAME
		tert-Amyl Peroxypivalate					Table A9.2.5
		tert-Butyl Peroxydiethylacetate					Table A9.2.5
		tert-Butyl Peroxy-2-Ethylhexanoate					Table A9.2.6
		tert-Butyl Peroxypivalate					Table A9.2.5
		Di-sec-Butyl-Peroxydicarbonate					Table A9.2.4
		Di-(2-Ethylhexyl) Peroxydicarbonate					Table A9.2.5
		Di-n-Propyl Peroxydicarbonate					Table A9.2.4
		Organic Peroxide, Liquid Temperature Controlled					Table A9.2.2
★	UN3104	ORGANIC PEROXIDE TYPE C, SOLID	5.2		II	P5	SEE BELOW BY TECHNICAL NAME
		Cyclohexanone Peroxide(s)					Table A9.3.6
		Dibenzoyl Peroxide					Table A9.3.6
		2,5-Dimethyl-2-5-di-(Benzoyl Peroxy) Hexane					Table A9.3.5
		2,5-Dimethyl-2,5-Dihydroperoxyhexane					Table A9.3.6
		Organic Peroxide, Solid, Sample					Table A9.3.2
★	UN3114	ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED	5.2		II	P3	SEE BELOW BY TECHNICAL NAME
		Di-(4-tert-Butylcyclohexyl) Peroxydicarbonate					Table A9.3.6
		Dicyclohexyl Peroxydicarbonate					Table A9.3.3
		Dideconoyl Peroxide					Table A9.3.6
		Di-n-Octanoyl Peroxide					Table A9.3.5
		Organic Peroxide, Solid, Temperature Controlled					Table A9.3.2
★	UN3105	ORGANIC PEROXIDE TYPE D, LIQUID	5.2		II	P5	Table A9.2.7
		Acetyl acetone peroxide					
		Acetyl benzoyl peroxide					
		tert-Butyl cumyl peroxide					
		tert-Butyl hydroperoxide					
		tert-Butyl peroxybenzoate					
		tert-Butyl peroxycrotonate					
		tert-Butyl peroxydiethylacetate and tert-Butyl eroxybenzoate					
		tert-Butyl peroxy-3,5,5-trimethylhexanoate					
		Cyclohexanone peroxide(s)					
		1,1 Di-(tert-butylperoxy) cyclohexane					
		Di-(tert-butylperoxy) phthalate					
		2,2-Di-(tert-butylperoxy)-propane					
		2,5-Dimethyl-2,5-di-(tert-butyl-peroxy)hexane					
		2,5-Dimethyl-2,5-di-(3,5,5-trimethylhexanoylperoxy)					
		hexane					
		Ethyl-3,3-di-(tert-amylperoxy)-butryrate					
		Ethyl-3,3-di-(tert-butylperoxy)-butyrate					
		3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononan e					
		p-Methyl hydroperoxide					
		Methyl ethyl ketone peroxide(s)					
		Methyl isobutyl ketone peroxide(s)					
		Peroxyacetic acid, type D, stabilized					
		1,1,3,3-Tertamethylbutyl hydroperoxide					
★	UN3115	ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED	5.2		II	P3	Table A9.2.7
		Acetyl cyclohexanesulphonyl peroxide					
		tert-Amyl peroxy-2-ethylhexanoate					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		tert-Amyl peroxyneodecanoate					
		tert-Butyl peroxy-2-ethylhexanoate and 2,2-Di-(tert-butylperoxy)butane					
		tert-Butyl peroxyisobutyrate					
		tert-Butyl peroxyneodecanoate					
		tert-Butyl peroxypivalate					
		Cumyl peroxyneodecanoate					
		Cumyl peroxypivalate					
		Diacetone alcohol peroxides					
		Diacetyl peroxide					
		Di-n-butyl-peroxydicarbonate					
		Di-sec-butyl peroxydicarbonate					
		Di-(2-ethylhexyl) peroxydicarbonate					
		Diethyl peroxydicarbonate					
		Diisobutyryl peroxide					
		Diisopropyl peroxydicarbonate					
		Diisotridecyl peroxydicarbonate					
		2,5-Dimethyl-2,5-di-(2-ethylhexanoylperoxy) hexane					
		Di-(3,5,5-trimethylhexanoyl) peroxide					
		Methylcyclohexanone peroxide(s)					
		1,1,3,3-Tetramethylbutylperoxy-2-ethylhexanoate					
		2,4,4-Trimethylpentyl-2-peroxy phenoxyacetate					
★	UN3106	ORGANIC PEROXIDE TYPE D, SOLID	5.2		II	P5	Table A9.3.7
		Acetyl acetone peroxide, as a paste					
		n-Butyl-4-4-di-(tertbutyl-peroxy)-valerate					
		tert-Butyl peroxybenzoate					
		tert-Butyl-peroxy-2-ethylhexanoate and 2,2-Di-(tert-butylperoxy)butane					
		3-tert-Butylperoxy-3-phenylphthalide					
		tert-Butylperoxy stearylcarbonate					
		3-Chloroperoxybenzoic acid					
		Cyclohexanone peroxide(s) as a paste					
		Dibenzoyl peroxide					
		Dibenzoyl peroxide, as a paste					
		1,1-Di-(tert-butylperoxy) cyclohexane					
		2,2-Di(1,4-tert-butylperoxycyclohexyl)propane					
		Di-(2-tert -butylperoxyisopropyl)-benzene(s)					
		Di-(tert-butylperoxy) phthalate, as a paste					
		2,2-Di-(tert-butylperoxy)propane					
		1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane					
		Di-4-chlorobenzoyl peroxide, as a paste					
		Di-2,4-dichlorobenzoyl peroxide, as a paste with silicon oil					
		Di-(1-hydroxycyclohexyl) peroxide					
		Dilauroyl peroxide					
		2,5-Dimethyl-2,5-di-(tert-butyl-peroxy)hexyne-3					
		2,5-Dimethyl-2,5-di-(tert-butyl-peroxy) hexane					
		Di-(2 phenoxyethyl) peroxydicarbonate					
		Distearyl peroxydicarbonate					
		Ethyl-3,3-di-(tert-butylperoxy)-butyrate					
		3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononae					
		Tetrahydronaphthyl hydroperoxide					
★	UN3116	ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED	5.2		II	P3	Table A9.3.7
		Dicetyl peroxydicarbonate					
		Dimyristyl peroxydicarbonate					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Di-n-nonanoyl peroxide					
		Diperoxy azelaic acid					
		Diperoxy DODecane diacid					
		Disuccinic acid peroxide					
		Di-(3,5,5-trimethyl-1,2-dioxo-lanyl-3)					
		peroxide, as a paste					
★	UN3107	ORGANIC PEROXIDE TYPE E, LIQUID	5.2		II	P5	Table A9.2.8
		tert-Amyl hydroperoxide					
		Di-tert-amyl peroxide					
		Di-tert-butyl peroxide					
		1,1-Di-(tert-butylperoxy)cyclohexane					
		Di-(tert-butylperoxy)phthalate					
		1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane					
		Methyl ethyl ketone peroxide(s)					
		Peroxyacetic acid, type E, stabilized					
★	UN3117	ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED	5.2		II	P3	SEE BELOW BY TECHNICAL NAME
		tert-Butyl peroxy-2-ethylhexanonate					Table A9.2.8
		Di-n-butyl peroxydicarbonate					Table A9.2.8
		Di-(2-ethylhexyl) peroxydicarbonate as a stable dispersion in water					Table A9.2.8
		Di-(2-Ethylhexyl) Peroxydicarbonate as a stable dispersion in water (frozen)					Table A9.3.8
		Dipropionyl peroxide					Table A9.2.8
★	UN3108	ORGANIC PEROXIDE TYPE E, SOLID	5.2		II	P5	Table A9.3.8
		tert-Butyl monoperoxymaleate, as a paste					
		Dibenzoyl peroxide, as a paste					
★	UN3118	ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED	5.2		II	P3	Table A9.3.8
★	UN3109	ORGANIC PEROXIDE TYPE F, LIQUID	5.2		II	P5	Table A9.2.8
		tert-Butylhydroperoxide					
		Cumyl hydroperoxide					
		Dilauroyl peroxide, as a stable dispersion in water					
		Isopropylcumyl hydroperoxide					
		p-Menthyl hydroperoxide					
		Peroxyacetic acid, Type F, stabilized					
		Pinanyl hydroperoxide					
★	UN3119	ORGANIC PEROXIDE TYPE F, LIQUID TEMPERATURE CONTROLLED	5.2		II	P3	Table A9.2.8
		Di-(4-tert-butylcyclohexyl) peroxydicarbonate, as a stable dispersion in water					
		Dicetyl peroxydicarbonate, as a stable dispersion in water					
		Dimyristyl peroxydicarbonate, as a stable dispersion in water					
★	UN3110	ORGANIC PEROXIDE TYPE F, SOLID *Dicumyl peroxide*	5.2		II	P5	Table A9.3.8
★	UN3120	ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED	5.2		II	P3	Table A9.3.8
D	NA1955	ORGANIC PHOSPHATE MIXED WITH COMPRESSED GAS, ORGANIC PHOSPHATE COMPOUND MIXED WITH COMPRESSED GAS *or* ORGANIC PHOSPHORUS COMPOUND MIXED WITH COMPRESSED GAS	2.3				FORBIDDEN
	UN3313	ORGANIC PIGMENTS, SELF-HEATING	4.2		II III	P5 P5	A8.3. A8.3.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3280	ORGANOARSENIC COMPOUND, LIQUID N.O.S.	6.1		I II III	P5, 5 P5 P5	A10.4. A10.4. A10.4.
★	UN3465	ORGANOARSENIC COMPOUND, SOLID N.O.S.	6.1		I II III	P5, 5 P5 P5	A10.5. A10.5. A10.5.
★	UN2762	ORGANOCHLORINE PESTICIDES LIQUID, FLAMMABLE, TOXIC, *flashpoint less than 23 degrees C*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN2996	ORGANOCHLORINE PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2995	ORGANOCHLORINE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, *flashpoint not less than 23 degrees C*	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2761	ORGANOCHLORINE PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
★	UN3282	ORGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S.	6.1		I II III	P5 P5 P5	A10.4. A10.4. A10.4.
★	UN3467	ORGANOMETALLIC COMPOUND, TOXIC, SOLID, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
★	UN3392	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC	4.2				FORBIDDEN
★	UN3394	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE	4.2	4.3			FORBIDDEN
★	UN3398	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE	4.3		I II III	P3 P4 P5	A8.2. A8.2. A8.2.
★	UN3399	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE	4.3	3 3 3	I II III	P3 P4 P5	A8.2. A8.2. A8.2.
★	UN3391	ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC	4.2		I		FORBIDDEN
★	UN3393	ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC, WATER-REACTIVE	4.2	4.3	I		FORBIDDEN
★	UN3400	ORGANOMETALLIC SUBSTANCE, SOLID, SELF-HEATING	4.2		II III	P4 P5	A8.3. A8.3.
★	UN3395	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE	4.3		I II III	P3, N40 P4 P5	A8.3. A8.3. A8.3.
★	UN3396	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE	4.3	4.1	I II III	P3, N40 P4 P5	A8.3. A8.3. A8.3.
★	UN3397	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, SELF-HEATING	4.3	4.2	I II III	P3, N40 P4 P5	A8.3. A8.3. A8.3.
★	UN3279	ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S.	6.1	3 3	I II	P3, 5 P4	A10.4. A10.4.
★	UN3278	ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.4. A10.4. A10.4.
★	UN3464	ORGANOPHOSPHORUS COMPOUND, TOXIC, SOLID, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.6. A10.6. A10.6.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN2784	ORGANOPHOSPHOROUS PESTICIDES, LIQUID, FLAMMABLE, TOXIC, *flashpoint less than 23 degrees C*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3018	ORGANOPHOSPHORUS PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3, N76 P4, N76 P5, N76	A10.4. A10.4. A10.4.
★	UN3017	ORGANOPHOSPHORUS PESTICIDES, LIQUID, TOXIC, FLAMMABLE, *flashpoint not less than 23 degrees C*	6.1	3 3 3	I II III	P3, N76 P4, N76 P5, N76	A10.4. A10.4. A10.4.
★	UN2783	ORGANOPHOSPHORUS PESTICIDES, SOLID, TOXIC	6.1		I II III	P5, N77 P5, N77 P5, N77	A10.5. A10.5. A10.5.
	UN2788	ORGANOTIN COMPOUNDS, LIQUID, N.O.S.	6.1		I II	P3, A3, N33, N34 P4, A3, N33, N34	A10.4. A10.4.
	UN3146	ORGANOTIN COMPOUNDS, SOLID, N.O.S.	6.1		I II III	P5, A5 P5 P5	A10.5. A10.5. A10.5.
★	UN2787	ORGANOTIN PESTICIDES, LIQUID, FLAMMABLE, TOXIC, *flashpoint less than 23 degrees C*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3020	ORGANOTIN PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3019	ORGANOTIN PESTICIDES, LIQUID, TOXIC, FLAMMABLE, *flashpoint more than 23 degrees C*	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2786	ORGANOTIN PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Orthonitroaniline, see NITROANILINES, *etc.*					
		Orthophosphonic acid, see PHOSPHORIC ACID, SOLUTION *or* PHOSPHONIC ACID, SOLID					
		Osmic acid anhydride, see OSMIUM TETROXIDE					
	UN2471	OSMIUM TETROXIDE	6.1		I	P5, A8, N33, N34	A10.5.
		Other regulated substance, aromatic extracts or aromatic flavourings, (not falling under definitions of classes 1-8), see AVIATION REGULATED LIQUID, N.O.S. *or* AVIATION REGULATION SOLID, N.O.S.					
D	NA3082	OTHER REGULATED SUBSTANCES, LIQUID, N.O.S.	9		III	P5	A13.2.
D	NA3077	OTHER REGULATED SUBSTANCES, SOLID, N.O.S.	9		III	P5	A13.2.
★	UN3139	OXIDIZING LIQUID, N.O.S.	5.1		I II III	P3, 62, 127, A2 P4, 62, 127, A2 P5, 62, 127, A2	A9.5. A9.5. A9.5.
★	UN3098	OXIDIZING LIQUID, CORROSIVE, N.O.S.	5.1	8 8 8	I II III	P3, 62, A6 P4, 62 P5, 62	A9.5. A9.5. A9.5.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3099	OXIDIZING LIQUID, TOXIC, N.O.S.	5.1	6.1 6.1 6.1	I II III	P3, 62, A6 P4, 62 P5, 62	A9.5. A9.5. A9.5.
★	UN1479	OXIDIZING SOLID, N.O.S.	5.1		I II III	P5, 62 P5, 62 P5, 62	A9.6. A9.6. A9.6.
★	UN3085	OXIDIZING SOLID, CORROSIVE, N.O.S.	5.1	8 8 8	I II III	P5 P5 P5	A9.6. A9.6. A9.6.
★	UN3137	OXIDIZING SOLID, FLAMMABLE, N.O.S.	5.1	4.1	I	P4	A9.8.
★	UN3100	OXIDIZING SOLID, SELF-HEATING, N.O.S.	5.1	4.2 4.2	I II	P3, 62 P4, 62	 A9.8.
★	UN3087	OXIDIZING SOLID, TOXIC, N.O.S.	5.1	6.1 6.1 6.1	I II III	P5, 62 P5, 62 P5, 62	A9.6. A9.6. A9.6.
★	UN3121	OXIDIZING SOLID, WATER-REACTIVE, N.O.S.	5.1	4.3		P4, 62	A9.8.
		Oxirane, see ETHYLENE OXIDE					
	UN1072	OXYGEN, COMPRESSED	2.2	5.1		P5, 110	A6.3., A6.5.
	UN2190	OXYGEN DIFLUORIDE. COMPRESSED	2.3	5.1, 8		P1, 1, N86	A6.4.
	UN3356	OXYGEN GENERATORS, CHEMICAL *(including when contained in associated equipment, e.g. passenger service units (PSU's) portable breathing equipment (PBE) etc.)*	5.1		II	P4, 60	A9.10.
+	NA3356	OXYGEN GENERATOR, CHEMICAL SPENT	9		III		FORBIDDEN
	UN1073	OXYGEN, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2	5.1		P4	A6.11.
		1-Oxy-4-nitrobenzene, see NITROPHENOLS					
	UN1263	PAINT *(including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, and liquid lacquer base) or* PAINT RELATED MATERIAL *(including paint thinning or reducing compounds)*	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
	UN3066	PAINT *or* PAINT RELATED MATERIAL	8		II III	P5 P5	A12.2. A12.2.
	UN3470	PAINT, CORROSIVE, FLAMMABLE *(including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or* PAINT RELATED MATERIAL CORROSIVE FLAMMABLE *(including paint thinning or reducing compound)*	8	3	II	P5	A12.2
		Paint driers, see FLAMMABLE SOLID, ORGANIC, N.O.S. *or* FLAMMABLE SOLID, INORGANIC, N.O.S.					
	UN3469	PAINT, FLAMMABLE, CORROSIVE *(including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or* PAINT RELATED MATERIAL, FLAMMABLE, CORROSIVE *(including paint thinning or reducing compound)*	3	8	I II III	P5 P5 P5	A12.2 A12.2 A12.2
	UN1379	PAPER, UNSATURATED OIL TREATED *incompletely dried (including carbon paper)*	4.2		III	P5	A8.3.
	UN2213	PARAFORMALDEHYDE	4.1		III	P5, A1	A8.3.
	UN1264	PARALDEHYDE	3		III	P5	A7.2.
		Paranitroaniline solid, see NITROANILINES,*etc*					
D	NA1967	PARATHION AND COMPRESSED GAS MIXTURE	2.3			P2, 3	A6.18.
		Paris green, solid, see COPPER ACETOARSENITE					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		PCB, see POLYCHLORINATED BIPHENYLS LIQUID *or* POLYCHLORINATED BIPHENYLS, SOLID					
+	UN1380	PENTABORANE	4.2	6.1	I		FORBIDDEN
	UN1669	PENTACHLOROETHANE	6.1		II	P5	A10.4.
	UN3155	PENTACHLOROPHENOL	6.1		II	P5	A10.5.
	UN0411	PENTAERYTHRITE TETRANITRATE *or* PENTAERYTHRITOL TETRANITRATE *or* PETN *with not less than 7% wax by mass*	1.1D		II	P4	A5.6.
★	UN3344	PENTAERYTHRITE TETRANITRATE MIXTURE, DESENSITIZED SOLID, N.O.S. *with more than 10% but less than or equal to 20% PETN by mass*	4.1		II	P4, 118, N85	A8.4.
	UN0150	PENTAERYTHRITE TETRANITRATE, WETTED *or* PENTAERYTHRITOL TETRANITRATE, WETTED *or* PETN, WETTED *with not less than 25% water by mass, or* PETN, DESENSITIZED *with 15% or more phlegmatizer, by weight or* PENTAERYTHRITE TETRANITRATE *or* PENTAERYTHRITOL TETRANITRATE *or* PENTAERYTHRITE TETRANITRATE, DESENSITIZED *with not less than 15% phlegmatizer by mass* or	1.1D		II	P4	A5.6.
		Pentaerythrite Tetranitrate (dry)					FORBIDDEN
		Pentaerythritol tetranitrate (dry)					FORBIDDEN
		Pentafluroethane, 1,1,1,2-tetrafluoroethaneazeotropic mixture with approximately 44% pentafluoroethane and 52% 1,1,1-trifluoroethane, see REFRIGERANT GAS R404A					
	UN3220	PENTAFLUOROETHANE *or* REFRIGERANT GAS R125	2.2			P5	A6.3., A6.4.
	UN2286	PENTAMETHYLHEPTANE	3		III	P5	A7.2.
		Pentanal, see VALERADEHYDE					
		n-Pentane, see PENTANES					
	UN2310	PENTANE-2,4-DIONE	3	6.1	III	P5	A7.2.
		Pentane, methyl, see HEXANES					
	UN1265	PENTANES	3		I II	P3 P5	A7.2. A7.2.
		Pentanitroaniline (dry)					FORBIDDEN
		3-Pentanol, see PENTANOLS					
	UN1105	PENTANOLS	3		II III	P5 P5	A7.2. A7.2.
	UN1108	1-PENTENE (N-AMYLENE)	3		I	P3	A7.2.
	UN2705	1-PENTOL	8		II	P5	A12.2.
	UN0151	PENTOLITE, *dry or wetted with less than 15% water by mass*	1.1D		II	P4	A5.6.
		Pentyl nitrite, see AMYL NITRITE					
		Pepper spray, see AEROSOLS *or* SELF-DEFENSE SPRAY, NON-PRESSURIZED					
	UN3211	PERCHLORATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1		II III	P5 P5	A9.5. A9.5.
	UN1481	PERCHLORATES, INORGANIC, N.O.S.	5.1		II III	P5 P5	A9.6. A9.6.
	UN1873	PERCHLORIC ACID with *more than 50% but not more than 72% acid, by mass*	5.1	8	I	P3, A2, A3, N41	A9.5.
		Perchloric Acid, with more than 72% acid by mass					FORBIDDEN
		Perchlorobenzene, see HEXACHLOROBENZENE					
		Perchlorocyclopentadiene, see HEXACHLOROCYCLOPENTADIENE					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Perchloroethylene, see TETRACHLOROETHYLENE					
		Perchloromethane, see CARBON TETRACHLORIDE					
	UN1802	PERCHLORIC ACID with *not more than 50% acid by mass*	8	5.1	II	P4, N41	A12.2.
		Perchloroethylene, see TETRACHLOROETHYLENE					
	UN1670	PERCHLOROMETHYL MERCAPTAN	6.1		I	P2, 2, A3, A7, N34	A10.6.
	UN3083	PERCHLORYL FLUORIDE	2.3	5.1		P2, 2	A6.5.
		Percussion Caps; *see* PRIMERS, CAP TYPE					
		Perfluoroacetyl chloride, see TRIFLUOROACETYL CHLORIDE					
		Perfluoro-2-butene, see OCTAFLUOROBUT-2-ENE					
	UN3154	PERFLUORO (ETHYL VINYL ETHER)	2.1			P4	A6.3., A6.4., A6.5.
	UN3153	PERFLUORO (METHYL VINYL ETHER)	2.1			P4	A6.3., A6.4., A6.5.
		Perfluoropropane, see OCTAFLUOROPROPANE					
		Perfluoro-2-butene, see OCTAFLUOROBUT-2-ENE					
	UN1266	PERFUMERY PRODUCTS *with flammable solvents*	3		II III	P5 P5	A7.2. A7.2.
		Perfumery products in small inner packagings, see CONSUMER COMMODITY					
★	UN3214	PERMANGANATES, INORGANIC AQUEOUS SOLUTION, N.O.S.	5.1		II	P5	A9.5.
		Peroxide organic, see ORGANIC PEROXIDE, *etc.*					
★	UN1482	PERMANGANATES, INORGANIC, N.O.S.	5.1		II III	P5, A30 P5, A30	A9.6. A9.6.
	UN1483	PEROXIDES, INORGANIC, N.O.S.	5.1		II III	P5, A7, A20, N34 P5, A7, A20, N34	A9.6. A9.6.
		Peroxyacetic acid, more than 43% and with more than 6% hydrogen peroxide					FORBIDDEN
	UN3216	PERSULFATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1		III	P5	A9.5.
	UN3215	PERSULFATES, INORGANIC, N.O.S.	5.1		III	P5	A9.6.
★	UN3021	PESTICIDES, LIQUID, FLAMMABLE, TOXIC, *flashpoint less than 23 degrees C*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN2902	PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2903	PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S. *flashpoint not less than 23 degrees C*	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2588	PESTICIDES, SOLID, TOXIC, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Pesticide, toxic, under compressed gas, n.o.s., see AEROSOLS FLAMMABLE					
		PETN, *see* PENTAERYTHRITE TETRANITRATE	1.1D		II		
		PETN/TNT, *see* PENTOLITE, *etc*					
	UN0411	PETN *with 7% or more wax, by weight*	1.1D		II	P4	A5.6.
	UN0150	PETN, DESENSITIZED *with 15% or more phlegmatizer, by weight or* PETN, WETTED *with 25% or more water, by weight*	1.1D		II	P4	A5.6.
	UN1203	PETROL *or* GASOLINE *or* MOTOR SPIRIT	3		II	P5	A7.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1267	PETROLEUM CRUDE OIL	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
	UN1268	PETROLEUM DISTILLATES, N.O.S. *or* PETROLEUM PRODUCTS, N.O.S.	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
		Petroleum ether, see PETROLEUM DISTILLATES, N.O.S.					
		Petroleum raffinate, see PETROLEUM DISTILLATES, N.O.S.					
		Petroleum spirit, see PETROLEUM PRODUCTS, N.O.S.					
	UN1075	PETROLEUM GASES, LIQUEFIED *or* LIQUEFIED PETROLEUM GAS	2.1			P4	A6.3., A6.6.
		Petroleum naphtha, see PETROLEUM DISTILLATES, N.O.S.					
		Petroleum oil, see PETROLEUM PRODUCTS, N.O.S.					
D	NA1270	PETROLEUM OIL	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
	UN3494	PETROLEUM SOUR CRUDE, FLAMMABLE, TOXIC	3	6.1	I II III	P3 P5 P5	A7.2. A7.2. A7.2.
	UN2645	PHENACYL BROMIDE	6.1		II	P5	A10.5.
+	UN2311	PHENETIDINES	6.1		III	P5	A10.4.
	UN2312	PHENOL, MOLTEN	6.1				FORBIDDEN
+	UN1671	PHENOL, SOLID	6.1		II	P5, N78	A10.5.
	UN2821	PHENOL SOLUTIONS	6.1		II III	P5 P5	A10.4. A10.4.
	UN2904	PHENOLATES, LIQUID	8		III	P5	A12.2.
	UN2905	PHENOLATES, SOLID	8		III	P5	A12.3.
	UN1803	PHENOLSULFONIC ACID, LIQUID	8		II	P5, N41	A12.2.
★	UN3346	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC *(flashpoint less than 23 degrees C)*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE *(flashpoint not less than 23 degrees C)*	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3345	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN2746	PHENYL CHLOROFORMATE	6.1	8	II	P4	A10.4.
		Phenyl cyanide, see BENZONITRILE					
		Phenyldichloroarsine					FORBIDDEN
		m-Phenylene diaminediperchlorate (dry)					FORBIDDEN
	UN2487	PHENYL ISOCYANATE	6.1	3	II	P2, 2, N33, N34	A10.6.
		Phenylisocyanodichloride, see PHENYLCARBYLAMINE CHLORIDE					
	UN2337	PHENYL MERCAPTAN	6.1	3	I	P2, 2	A10.6.
		1-Phenyl-5-mercapto-tetrazol, see FLAMMABLE SOLID, ORGANIC, N.O.S.					
	UN2798	PHENYL PHOSPHORUS DICHLORIDE	8		II	P4	A12.2.
	UN2799	PHENYL PHOSPHOROUS THIODICHLORIDE	8		II	P4	A12.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		2-Phenylpropene, see ISOPROPENYLBENZENE					
	UN3002	PHENYL UREA PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
	UN2470	PHENYLACETONITRILE, LIQUID	6.1		III	P5	A10.4.
	UN2577	PHENYLACETYL CHLORIDE	8		II	P5	A12.2.
		Phenylamine, see ANILINE					
		1-Phenylbutane or 2-Phenylbutane, see BUTYLBENZENES					
	UN1672	PHENYLCARBYLAMINE CHLORIDE	6.1		I	P2, 2	A10.6.
+	UN1673	PHENYLENEDIAMINES *(o-,m-,p-)*	6.1		III	P5	A10.5.
		Phenylethylene, see STYRENE MONOMER, STABILIZED					
		D(-)alpha Phenylglycine chloride hydrochloride, see AVIATION REGULATED LIQUID, N.O.S.					
	UN2572	PHENYLHYDRAZINE	6.1		II	P5	A10.4.
	UN1674	PHENYLMERCURIC ACETATE	6.1		II	P5	A10.5.
★	UN2026	PHENYLMERCURIC COMPOUNDS, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN1894	PHENYLMERCURIC HYDROXIDE	6.1		II	P5	A10.5.
	UN1895	PHENYLMERCURIC NITRATE	6.1		II	P5	A10.5.
	UN1804	PHENYLTRICHLOROSILANE	8		II	P4, A7, N34	A12.2.
	UN1076	PHOSGENE	2.3	8		P1, 1	A6.15.
	UN2940	9-PHOSPHABICYCLONONANES *or* CYCLOOCTADIENE PHOSPHINES	4.2		II	P5, A19	A8.3.
	UN2199	PHOSPHINE	2.3	2.1		P1, 1	A6.15.
		Phosphoretted hydrogen, see PHOSPHINE					
		Phosphoric acid, anhydrous, see PHOSPHORUS PENTOXIDE					
	UN3453	PHOSPHORIC ACID, SOLID	8		III	P5, A7, N34	A12.3
	UN1805	PHOSPHORIC ACID, SOLUTION	8		III	P5, A7, N34	A12.2.
		Phosphoric acid triethyleneimine, see TRIS-(1-AZIRIDIYL) PHOSPHINE OXIDE, SOLUTION					
		Phosphoric Anhydride, see PHOSPHORUS PENTOXIDE					
	UN2834	PHOSPHOROUS ACID	8		III	P5	A12.3.
	UN1338	PHOSPHORUS, AMORPHOUS	4.1		III	P5, A1, A19	A8.3.
		Phosphorus bromide, see PHOSPHORUS TRIBROMIDE					
		Phosphorus chloride, see PHOSPHORUS TRICHLORIDE					
	UN1339	PHOSPHORUS HEPTASULFIDE, *free from yellow or white phosphorus*	4.1		II	P5, A20, N34	A8.3.
		Phosphorous pentasulfide, with yellow and/or white phosphorous					
	UN1939	PHOSPHORUS OXYBROMIDE	8		II	P5, N41, N43	A12.3.
	UN2576	PHOSPHORUS OXYBROMIDE, MOLTEN	8				FORBIDDEN
+	UN1810	PHOSPHORUS OXYCHLORIDE	6.1	8	I	P2, 2, A7, N34	A10.6.
	UN2691	PHOSPHORUS PENTABROMIDE	8		II	P4, A7, N34	A12.2.
	UN1806	PHOSPHORUS PENTACHLORIDE	8		II	P4, A7, N34	A12.2.
	UN2198	PHOSPHORUS PENTAFLUORIDE	2.3	8		P1, 2	A6.4., A6.5.
	UN1340	PHOSPHORUS PENTASULFIDE, *free from yellow or white phosphorus*	4.3	4.1	II	P5, A20	A8.3.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Phosphorus pentasulfide, with yellow and/or white phosphorus					FORBIDDEN
	UN1807	PHOSPHORUS PENTOXIDE	8		II	P4, A7, N34	A12.3.
	UN1341	PHOSPHORUS SESQUISULFIDE, *free from yellow or white phosphorus*	4.1		II	P5, A20, N34	A8.3.
		Phosphorus sesquisulphide, with yellow and/or white phosphorus					FORBIDDEN
		Phosphorus sulphochloride, see THIOPHOSPHORYL CHLORIDE					
	UN1808	PHOSPHORUS TRIBROMIDE	8		II	P4, A3, A6, A7, N34, N43	A12.2.
	UN1809	PHOSPHORUS TRICHLORIDE	6.1	8	I	P2, 2, N34	A12.11.
	UN2578	PHOSPHORUS TRIOXIDE	8		III	P5	A12.3.
	UN1343	PHOSPHORUS TRISULFIDE, *free from yellow or white phosphorus*	4.1		II	P5, A20, N34	A8.3.
		Phosphorus trisulphide, with yellow and/or white phosphorus					FORBIDDEN
		Phosphorus (V) sulfide, free from yellow and white phosphorus, see PHOSPHORUS PENTASULFIDE					
	UN1381	PHOSPHORUS, WHITE DRY *or* PHOSPHORUS, WHITE, UNDER WATER *or* PHOSPHORUS WHITE IN SOLUTION *or* PHOSPHORUS YELLOW DRY *or* PHOSPHORUS YELLOW UNDER WATER *or* PHOSPHORUS YELLOW IN SOLUTION	4.2	6.1	I	P3, N34	A8.16.
	UN2447	PHOSPHORUS WHITE, MOLTEN	4.2	6.1	I		FORBIDDEN
		Phosphorus (white or red) and a chlorate, mixtures of					FORBIDDEN
		Phosphoryl Chloride, see PHOSPHORUS OXYCHLORIDE					
	UN2214	PHTHALIC ANHYDRIDE *with more than .05% maleic anhydride*	8		III	P5	A12.3.
	UN2313	PICOLINES	3		III	P5	A7.2.
	UN0153	PICRAMIDE	1.1D		II	P4	A5.7.
	UN0154	PICRIC ACID *or* TRINITROPHENOLBENZENE	1.1D		II	P4	A5.6.
	UN3364	PICRIC ACID, WETTED *with 10% or more water, by weight*	4.1		I	P4, A8, A19, N41	A8.3.
	UN1344	PICRIC ACID, WETTED *with 30% or more water, by weight*	4.1		I	P4, A8, A19, N41	A8.3.
		Picrite, see NITROGUANIDINE, *etc.*					
	UN0282	PICRITE *dry or wetted with less than 20% water, by weight*	1.1D			P4	A5.6.
	UN1336	PICRITE, WETTED *with 20% or more water, by weight*	4.1		I	P4, 23, A8, A19, A20, N41	A8.3.
		Picotroxin, see TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S. *or* TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.					
	UN0155	PICRYL CHLORIDE *or* TRINITROCHLOROBENZENE	1.1D		II	P4	A5.7.
	UN3365	PICRYL CHLORIDE, WETTED *with 10% or more water, by weight*	4.1		I	P4	A8.3.
	UN1272	PINE OIL	3		III	P5	A7.2.
	UN2368	alpha-PINENE	3		III	P5	A7.2.
	UN2579	PIPERAZINE	8		III	P5	A12.3.
	UN2401	PIPERIDINE	8	3	I	P4	A12.2.
		Pivaloyl Chloride, see TRIMETHYLACETYL CHLORIDE					
		Plastic explosives, see EXPLOSIVE, BLASTING, TYPE D					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN3314	PLASTIC MOULDING COMPOUND *in dough, sheet, or extruded rope form evolving flammable vapor*	9		III	P5	A13.17.
★	UN2006	PLASTICS, NITROCELLULOSE BASED, SELF- HEATING, N.O.S.	4.2		III	P2	A8.3.
		Plastic solvent, n.o.s., see FLAMMABLE LIQUIDS, N.O.S.					
		Polish, see PAINT					
		Poisonous gases, n.o.s., see COMPRESSED *or* LIQUEFIED GASES, FLAMMABLE *or* TOXIC, N.O.S.					
		Polyalkylamines, n.o.s., see AMINES, *etc.*					
★	UN2733	POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S. *or* AMINES, FLAMMABLE, CORROSIVE N.O.S.	3	8 8 8	I II III	P3 P5 P5	A7.2. A7.2. A7.2.
★	UN2735	POLYAMINES, LIQUID, CORROSIVE, N.O.S. *or* AMINES, LIQUID, CORROSIVE, N.O.S.	8		I II III	P3 P4 P5	A12.2. A12.2. A12.2.
★	UN2734	POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. *or* AMINES, LIQUID, CORROSIVE, FLAMMABLE N.O.S.	8	3 3	I II	P5 P5	A12.2. A12.2.
★	UN3259	POLYAMINES, SOLID, CORROSIVE, N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
	UN2315	POLYCHLORINATED BIPHENYLS, LIQUID	9		II	P5, 9	A13.2.
	UN3432	POLYCHLORINATED BIPHENYLS, SOLID	9		II	P5, 9	A13.2.
	UN3269	POLYESTER RESIN KIT	3		II III	P5 P5	A7.6. A7.6.
	UN3151	POLYHALOGENATED BIPHENYLS, LIQUID *or* POLYHALOGENATED TERPHENYLS, LIQUID	9		II	P5	A13.2.
	UN3152	POLYHALOGENATED BIPHENYLS, SOLID, *or* POLYHALOGENATED TERPHENYLS, SOLID	9		II	P5	A13.2.
	UN2211	POLYMERIC BEADS, EXPANDABLE, *evolving flammable vapor*	9		III	P5	A13.17.
		Polystyrene beads, expandable, etc., see POLYMERIC BEADS, EXPANDABLE					
	UN2257	POTASSIUM	4.3		I	P3, A7, A19, A20, N6, N34	A8.3.
	UN1677	POTASSIUM ARSENATE	6.1		II	P5	A10.5.
	UN1678	POTASSIUM ARSENITE	6.1		II	P5	A10.5.
		Potassium bifluoride, see POTASSIUM HYDROGENDIFLUORIDE, SOLID *or* POTASSIUM HYDROGENDIFLUORIDE, SOLUTION					
		Potassium bisulfate, see HYDROGEN POTASSIUM BISULFATE					
		Potassium bisulfite solution, see BISULFITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.					
	UN1870	POTASSIUM BOROHYDRIDE	4.3		I	P3, A19, N40	A8.3.
	UN1484	POTASSIUM BROMATE	5.1		II	P5	A9.6.
		Potassium carbonyl					FORBIDDEN
	UN1485	POTASSIUM CHLORATE	5.1		II	P5, A9, N34	A9.6.
	UN2427	POTASSIUM CHLORATE, AQUEOUS SOLUTION	5.1		II III	P5, A2 P5, A2	A9.5. A9.5.
		Potassium chlorate mixed with mineral oil, see EXPLOSIVE BLASTING, TYPE C					
	UN1679	POTASSIUM CUPROCYANIDE	6.1		II	P5	A10.5.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1680	POTASSIUM CYANIDE, SOLID	6.1		I	P5, N74, N75	A10.5.
	UN3413	POTASSIUM CYANIDE, SOLUTION	6.1		I II III	P5, N74, N75 P5, N74, N75 P5, N74, N75	A10.4. A10.4. A10.4.
		Potassium dichloro isocyanurate or Potassium dichloro-s-triazinetrione, see DICHLOROISOCYANURIC ACID DRY *or* DICHLOROISOCYANURIC ACID SALTS, *etc*					
		Potassium dicyanocuprate (I), see POTTASIUM CUPROCYANIDE					
	UN1929	POTASSIUM DITHIONITE *or* POTASSIUM HYDROSULFITE	4.2		II	P5, A8, A19, A20	A8.3.
	UN1812	POTASSIUM FLUORIDE, SOLID	6.1		III	P5	A10.5.
	UN3422	POTASSIUM FLUORIDE, SOLUTION	6.1		III	P5	A10.4.
	UN2628	POTASSIUM FLUOROACETATE	6.1		I	P5	A10.5.
	UN2655	POTASSIUM FLUOROSILICATE	6.1		III	P5	A10.5.
		Potassium hexafluorosilicate, see POTASSIUM FLUOROSILICATE					
		Potassium hydrate, see POTASSIUM HYDROXIDE, SOLID					
		Potassium hydrogen fluoride, see POTASSIUM HYDROGENDIFLUORIDE					
	UN2509	POTASSIUM HYDROGEN SULPHATE	8		II	P5, A7,N34	A12.3.
	UN1811	POTASSIUM HYDROGENDIFLUORIDE, SOLID	8	6.1	II	P5, N3, N34	A12.3.
	UN3421	POTASSIUM HYDROGENDIFLUORIDE, SOLUTION	8	6.1	II	P5, N3, N34	A12.2
		Potassium hydrogen fluoride, see POTASSIUM HYDROGENFLUORIDE, SOLID *or* POTASSIUM HYDROGENFLUORIDE SOLUTION					
	UN1929	POTASSIUM HYDROSULFITE *or* POTASSIUM DITHIONITE	4.2		II	P5, A19, A20, N34	A8.3.
		Potassium hydroxide, liquid, see POTASSIUM HYDROXIDE SOLUTION					
	UN1813	POTASSIUM, HYDROXIDE, SOLID	8		II	P5	A12.3.
	UN1814	POTASSIUM HYDROXIDE, SOLUTION	8		II III	P5 P5	A12.2. A12.2.
		Potassium hypochlorite, solution, see HYPOCHLORITE SOLUTIONS					
	UN1420	POTASSIUM, METAL ALLOYS, LIQUID	4.3		I	P3, A7, A19, A20	A8.2.
	UN3403	POTASSIUM METAL ALLOYS, SOLID	4.3		I	P3, A19, A20	A8.3.
		Potassium metal, liquid alloy, see ALKALI METAL ALLOYS, LIQUID, N.O.S.					
	UN2864	POTASSIUM METAVANADATE	6.1		II	P5	A10.5.
	UN2033	POTASSIUM MONOXIDE	8		II	P5	A12.3.
	UN1486	POTASSIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
		Potassium nitrate and sodium nitrate mixture, see SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE					
	UN1487	POTASSIUM NITRATE AND SODIUM NITRITE MIXTURES	5.1		II	P5	A9.6.
	UN1488	POTASSIUM NITRITE	5.1		II	P5	A9.6.
	UN1489	POTASSIUM PERCHLORATE	5.1		II	P5	A9.5., A9.6.
	UN1490	POTASSIUM PERMANGANATE	5.1		II	P5	A9.6.

Table A4.1 (1)	UN/ID NUMBER (2)	PROPER SHIPPING NAME/ DESCRIPTION (3)	HAZARD CLASS/ DIV (4)	SUBSIDIARY RISK (5)	PG (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	UN1491	POTASSIUM PEROXIDE	5.1		I	P5, A20, N34	A9.6.
	UN1492	POTASSIUM PERSULFATE	5.1		III	P5, A1, A29	A9.6.
	UN2012	POTASSIUM PHOSPHIDE	4.3	6.1	I	P3, A19, N40	A8.3.
		Potassium selenate, see SELENATES *or* SELENITES					
		Potassium silicofluoride, see POTASSIUM FLUOROSILICATE					
	UN1422	POTASSIUM SODIUM ALLOYS, LIQUID	4.3		I	P3, A19 N34, N40	A8.2.
	UN3404	POTASSIUM SODIUM ALLOYS, SOLID	4.3		I	P3, A19 N34, N40	A8.3.
	UN1382	POTASSIUM SULFIDE, ANHYDROUS *or* POTASSIUM SULFIDE *with less than 30% water of crystallization*	4.2		II	P5, A19, A20, N34	A8.3.
	UN1847	POTASSIUM SULFIDE, HYDRATED *with not less than 30% water of crystallization*	8		II	P5	A12.3.
	UN2466	POTASSIUM SUPEROXIDE	5.1		I	P5, A20	A9.6.
	UN0433	POWDER CAKE, WETTED, *or* POWDER PASTE, WETTED *with 17% or more alcohol, by mass*	1.1C		II	P4	A5.5.
	UN0159	POWDER CAKE, WETTED, *or* POWDER PASTE, WETTED *with not less than 25% water, by mass*	1.3C		II	P4	A5.5.
		Powder Paste, see POWDER CAKE, *etc.*					
	UN0160	POWDER, SMOKELESS	1.1C		II	P4, A69	A5.9.
	UN0161	POWDER, SMOKELESS	1.3C		II	P4, A69	A5.9.
	UN0509	POWDER, SMOKELESS	1.4C			P5, A69	A5.9.
		Power device, explosive, see CARTRIDGES, POWER DEVICE					
		Pressurized products, see AEROSOLS, FLAMMABLE					
	UN0377	PRIMERS, CAP TYPE	1.1B		II	P4, A69	A5.16.
	UN0378	PRIMERS, CAP TYPE	1.4B		II	P5, A69	A5.16.
	UN0044	PRIMERS, CAP TYPE	1.4S		II	P5, A69	A5.16.
		Primers small arms, see PRIMERS, CAP TYPE					
	UN0319	PRIMERS, TUBULAR	1.3G		II	P4	A5.16.
	UN0320	PRIMERS, TUBULAR	1.4G		II	P5	A5.16.
	UN0376	PRIMERS, TUBULAR	1.4S		II	P5, A69	A5.16.
	UN1210	PRINTING INK, *flammable* or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound) flammable	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
		Projectiles illuminating, see AMMUNITION, ILLUMINATING, *etc.*					
	UN0424	PROJECTILES, *inert, with tracer*	1.3G		II	P4	A5.12.
	UN0425	PROJECTILES, *inert, with tracer*	1.4G		II	P5	A5.12.
	UN0345	PROJECTILES, *inert with tracer*	1.4S		II	P5, A69	A5.12.
	UN0346	PROJECTILES, *with burster or expelling charge*	1.2D		II	P4	A5.12.
	UN0347	PROJECTILES, *with burster or expelling charge*	1.4D		II	P5	A5.12.
	UN0426	PROJECTILES, *with burster or expelling charge*	1.2F		II	P4	A5.12.
	UN0427	PROJECTILES, *with burster or expelling charge*	1.4F		II	P5	A5.12.
	UN0434	PROJECTILES, *with burster or expelling charge*	1.2G		II	P4	A5.12.
	UN0435	PROJECTILES, *with burster or expelling charge*	1.4G		II	P5	A5.12.
	UN0168	PROJECTILES, *with bursting charge*	1.1D		II	P4	A5.12.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN0167	PROJECTILES, *with bursting charge*	1.1F		II	P4	A5.12.
	UN0169	PROJECTILES, *with bursting charge*	1.2D		II	P4	A5.12.
	UN0324	PROJECTILES, *with bursting charge*	1.2F		II	P4	A5.12.
	UN0344	PROJECTILES, *with bursting charge*	1.4D		II	P5	A5.12.
	UN2200	PROPADIENE, STABILIZED	2.1			P4	A6.4.
		Propadiene mixed with methyl acetylene, see METHYL ACETYLENE AND PROPADIENE MIXTURES, STABILIZED					
	UN1978	PROPANE, *see also* PETROLEUM GAS, LIQUEFIED	2.1			P4	A6.3., A6.6.
	UN2402	PROPANETHIOLS	3		II	P5, A6	A7.2.
	UN1274	n-PROPANOL *or* PROPYL ALCOHOL, NORMAL	3		II III	P5 P5	A7.2. A7.2.
	UN0497	PROPELLANT, LIQUID	1.1C		II	P4	A5.10.
	UN0495	PROPELLANT, LIQUID	1.3C		II	P4	A5.10.
		Propellant, single, double or triple base, see POWDER SMOKELESS					
	UN0498	PROPELLANT, SOLID	1.1C		II	P4	A5.9.
	UN0499	PROPELLANT, SOLID	1.3C		II	P4	A5.9.
	UN0501	PROPELLANT, SOLID	1.4C		II		FORBIDDEN
		Propene, see PROPYLENE					
	UN1275	PROPIONALDEHYDE	3		II	P5	A7.2.
	UN3463	PROPIONIC ACID *with 90% or more acid by mass*	8	3	II	P5	A12.2
	UN1848	PROPIONIC ACID *with 10% or more and less than 90% acid by mass*	8		III	P5	A12.2.
	UN2496	PROPIONIC ANHYDRIDE	8		III	P5	A12.2.
	UN2404	PROPIONITRILE	3	6.1	II	P4	A7.2.
	UN1815	PROPIONYL CHLORIDE	3	8	II	P5	A7.2.
	UN1276	n-PROPYL ACETATE	3		II	P5	A7.2.
		Propyl alcohol, see PROPANOL					
	UN2364	n-PROPYL BENZENE	3		III	P5	A7.2.
		Propyl chloride, see 1-CHLOROPROPANE					
	UN2740	n-PROPYL CHLOROFORMATE	6.1	3, 8	I	P2, 2, A3, A6, A7, N34	A10.6.
	UN1281	PROPYL FORMATES	3		II	P5	A7.2.
	UN2482	n-PROPYL ISOCYANATE	6.1	3	I	P1, 1	A10.6.
		Propyl mercaptan, see PROPANETHIOLS					
	UN1865	n-PROPYL NITRATE	3		II	P5	A7.2.
	UN1277	PROPYLAMINE	3	8	II	P5, N34	A7.2.
	UN1077	PROPYLENE	2.1			P4	A6.3., A6.4.
	UN2611	PROPYLENE CHLOROHYDRIN	6.1	3	II	P5	A10.4.
	UN1280	PROPYLENE OXIDE	3		I	P3, A3, N34	A7.2.
	UN2258	1,2-PROPYLENEDIAMINE	8	3	II	P5, A3, A6, N34	A12.3.
		Propylene dichloride, see 1,2-DICHLOROPROPANE					
	UN1921	PROPYLENEIMINE, STABILIZED	3	6.1	I	P3, A3, N34	A7.2.
		Propyleneimine, unstabilized					FORBIDDEN
		Propylene or liquefied petroleum gas, see PETROLEUM GASES, LIQUEFIED					
	UN2850	PROPYLENE TETRAMER	3		III	P5	A7.2.
		Propylene timer, see TRIPOPYLENE					
	UN1816	PROPYLTRICHLOROSILANE	8	3	II	P5, A7, N34	A12.2.
		Prussic acid, see HYDROGEN CYANIDE, STABILIZED *or* HYDROCYANIC ACID, AQUEOUS SOLUTION *or* HYDROGEN CYANIDE, STABILIZED *or* HYDROGEN CYANIDE, SOLUTION IN ALCOHOL					
		Pyrazine hexahydride, see PIPERAZINE					
	UN3350	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC *(flashpoint less than 23 degrees C)*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN3352	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.5. A10.5. A10.5.
	UN3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE *(flashpoint not less than 23 degrees C)*	6.1	3 3 3	I II III	P3 P4 P5	A10.5. A10.5. A10.5.
	UN3349	PYRETHROID PESTICIDE, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN1282	PYRIDINE	3		II	P4	A7.2.
		Pyridine perchlorate					FORBIDDEN
★	UN3194	PYROPHORIC LIQUIDS, INORGANIC, N.O.S.	4.2		I	P3	A8.5.
★	UN2845	PYROPHORIC LIQUIDS, ORGANIC, N.O.S.	4.2		I	P3	A8.5.
★	UN1383	PYROPHORIC METALS, N.O.S., *or* PYROPHORIC ALLOYS, N.O.S.	4.2		I	P3	A8.11.
★	UN3200	PYROPHORIC SOLIDS, INORGANIC, N.O.S.	4.2		I	P3	A8.11.
★	UN2846	PYROPHORIC SOLIDS, ORGANIC, N.O.S.	4.2		I	P3	A8.11.
	UN1817	PYROSULFURYL CHLORIDE	8		II	P5	A12.2.
		Pyroxylin cement, see ADHESIVES					
		Pyroxylin plastic, see CELLULOID					
		Pyroxylin solution, see NITROCELLULOSE SOLUTION, FLAMMABLE					
		Pyroxylin solvent n.o.s., see FLAMMABLE LIQUID, N.O.S.					
	UN1922	PYRROLIDINE	3	8	II	P5	A7.2.
		Quebrachitol pentanitrate					FORBIDDEN
		Quicklime, see CALCIUM OXIDE					
		Quickmatch, see FUSE, NON-DETONATING					
		Quicksilver, see MERCURY					
	UN2656	QUINOLINE	6.1		III	P5	A10.4.
		Quinone, see BENZOQUINONE					
		R12 *or* R21, *see* DICHLORODIFLUOROMETHANE					
		R12B1, *see* CHLORODIFLUOROBROMOMETHANE					
		R13, *see* CHLOROTRIFLUOROMETHANE					
		R13B1, *see* BROMOTRIFLUOROMETHANE					
		R14, *see* TETRAFLUOROMETHANE					
		R22, *see* CHLORODIFLUOROMETHANE					
		R114, *see* DICHLOROTETRAFLUOROETHANE					
		R115, *see* CHLOROPENTAFLUOROETHANE					
		R116, *see* HEXAFLUOROETHANE					
		R124, *see* CHLOROTETRAFLUOROETHANE					
		R133a, *see* CHLOROTRIFLUOROETHANE					
		R152a, *see* DIFLUOROETHANE					
		R500, *see* DICHLORODIFLUOROMETHANE and DIFLUROETHANE, *etc.*					
		R502, *see* CHLORODIFLUOROMETHANE					
		R503, *see* CHLOROTRIFLUOROMETHANE and TRIFLUOROMETHANE, *etc.*					
	UN2911	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-INSTRUMENTS	7			A507	A11.5.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2911	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES	7			A507	A11.5.
	UN2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES MANUFACTURED FROM DEPLETED URANIUM	7			A507	A11.5.
	UN2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES MANUFACTURED FROM NATURAL THORIUM	7			A507	A11.5.
	UN2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES MANUFACTURED FROM NATURAL URANIUM	7			A507	A11.5.
	UN2908	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-EMPTY PACKAGING	7			A507	A11.5.
	UN2910	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE- LIMITED QUANTITY OF MATERIAL	7			P5	A11.5.
	UN2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) *non-fissile or fissile-excepted*	7			A56, A507	A11.6
	UN3321	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II) *non-fissile or fissile-excepted*	7			A56, A507	A11.6
	UN3324	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II) FISSILE	7			A56, A507	A11.6, A11.10.
	UN3322	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III) *non-fissile or fissile-excepted*	7			A56, A507	A11.6.
	UN3325	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III) FISSILE	7			A56, A507	A11.6, A11.10.
	UN2913	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I) *non-fissile or fissile-excepted*	7			A56, A507	A11.6.
	UN2913	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-II) *non-fissile or fissile-excepted*	7			A56, A507	A11.6.
	UN3326	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I), FISSILE	7			A56, A507	A11.6.
	UN3326	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-II), FISSILE	7			A56, A507	A11.6.
	UN2919	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT *non-fissile or fissile-excepted*	7			139, A56, A507	A11.11.
	UN3331	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE	7			139, A56, A507	A11.11.
	UN2915	RADIOACTIVE MATERIAL, TYPE A PACKAGE *non-special form, non-fissile or fissile-excepted*	7			A56, A507	A11.8. , A11.12.
	UN3327	RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE *non-special form*	7			A56, A507	A11.10.
	UN3332	RADIOACTIVE MATERIAL,TYPE A PACKAGE, SPECIAL FORM *non-fissile or fissile-excepted*	7			A56, A507	A11.8.
	UN3333	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE	7			A56, A507	A11.10.
	UN2917	RADIOACTIVE MATERIAL,TYPE B(M) PACKAGE *non-fissile or fissile-excepted*	7			A56, A507	A11.9.
	UN3329	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE	7			A56, A507	A11.10.
	UN2916	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE *non-fissile or fissile-excepted*	7			A56, A507	A11.9.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN3328	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE	7			A56, A507	A11.10.
	UN2978	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE *non-fissile or fissile-excepted*	7			A56, A507	A11.7.
	UN2977	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE	7			A507	A11.7., A11.10.
	UN1856	RAGS, OILY	4.2		III		FORBIDDEN
		Rags, wet, see COTTON, WET					
		Railway torpedo, see SIGNALS, RAILWAY TRACK, EXPLOSIVE					
		RC138, see OCTAFLUOROCYCLOBUTANE					
	UN0391	RDX AND CYCLOTETRAMETHYLENETETRAMINE MIXTURE, WETTED *with not less than 15% water by mass*	1.1D		II	P4	A5.6.
	UN0391	RDX AND CYCLOTETRAMETHYLENETETRAMINE MIXTURE, DESENSITIZED *with not less than 10% phlegmatizer by mass*	1.1D		II	P4	A5.6.
	UN0483	RDX, DESENSITIZED	1.1D		II	P4	A5.6.
	UN0072	RDX, WETTED *with not less than 15% water by mass*	1.1D		II	P4	A5.6.
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS (gas cartridges) *nonflammable, without release device, not refillable(and not exceeding 1L capacity)*	2.2			P5	A6.3., A6.4.
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS (gas cartridges) *flammable without release device, not refillable(and not exceeding 1L capacity*)	2.1			P5	A6.3., A6.4.
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS (*oxidizing)g without a release device, non -refillable*	2.2	5.1		P5	A6.3., A6.4.
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS *(toxic) without a release device, non-refillable*	2.3				FORBIDDEN
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS *(toxic and corrosive) without a release device, non-refillable*	2.3	8			FORBIDDEN
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS *(toxic and flammable) without a release device, non-refillable*	2.3	2.1			FORBIDDEN
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS *(toxic and oxidizing) without a release device, non-refillable*	2.3	5.1			FORBIDDEN
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS *(toxic, flammable, corrosive) without a release device, non-refillable*	2.3	2.1, 8			FORBIDDEN
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS *(toxic, oxidizing and corrosive) without a release device, non-refillable*	2.3	5.1, 8			FORBIDDEN
		Red Phosphorus, see PHOSPHORUS, AMORPHUS					
	UN1078	REFRIGERANT GAS, N.O.S.	2.2.			P5	A6.3.,A6.4.
	UN1028	REFRIGERANT GAS R12 *or* DICHLORODIFLUOROMETHANE	2.2			P5	A6.3., A6.4.
	UN1974	REFRIGERANT GAS R12B1 *or* CHLORODIFLUOROBROMO-METHANE	2.2			P5	A6.3., A6.4.
	UN1022	REFRIGERANT GAS R13 *or* CHLOROTRIFLUOROMETHANE	2.2			P5	A6.3., A6.4.
	UN1009	REFRIGERANT GAS R13B1 *or* BROMOTRIFLUOROMETHANE	2.2			P5	A6.3., A6.4.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1982	REFRIGERANT GAS R14 *or* TETRAFLUOROMETHANE	2.2			P5	A6.5.
	UN1029	REFRIGERANT GAS R21 *or* DICHLOROFLUOROMETHANE	2.2			P5	A6.3., A6.4.
	UN1018	REFRIGERANT GAS R22 *or* CHLORODIFLUOROMETHANE	2.2			P5	A6.3., A6.4.
	UN1984	REFRIGERANT GAS R23 *or* TRIFLUOROMETHANE	2.2			P5	A6.3., A6.4.
	UN3252	REFRIGERANT GAS R32 *or* DIFLUOROMETHANE	2.1			P4	A6.3., A6.5.
	UN1063	REFRIGERANT GAS R40 *or* METHYL CHLORIDE	2.1			P4	A6.3., A6.4.
	UN2454	REFRIGERANT GAS R41 *or* METHYL FLUORIDE	2.1			P4	A6.3., A6.4.
	UN1958	REFRIGERANT GAS R114 *or* DICHLOROTETRAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN1020	REFRIGERANT GAS R115 *or* CHLOROPENTAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN2193	REFRIGERANT GAS R116 *or* HEXAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN1021	REFRIGERANT GAS R124 or CHLOROTETRAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN3220	REFRIGERANT GAS R125 *or* PENTAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN1983	REFRIGERANT GAS R133A *or* CHLOROTRIFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN3159	REFRIGERANT GAS R134A *or* 1,1,1,2-TETRAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN2517	REFRIGERANT GAS 142B *or* 1-CHLORO-1,1-DIFLUOROETHANE	2.1			P4	A6.3., A6.4.
	UN2035	REFRIGERANT GAS 143A *or* 1,1,1-TRIFLUOROETHANE	2.1			P4	A6.3., A6.4.
	UN1030	REFRIGERANT GAS 152A *or* DIFLUOROETHANE	2.1			P4	A6.3., A6.4.
	UN2453	REFRIGERANT GAS 161 *or* ETHYL FLUORIDE	2.1			P4	A6.3., A6.4.
	UN2424	REFRIGERANT GAS 218 *or* OCTAFLUOROPROPANE	2.2			P5	A6.4.
	UN3296	REFRIGERANT GAS 227 *or* HEPTAFLUOROPROPANE	2.2			P5	A6.3., A6.4.
	UN1976	REFRIGERANT GAS RC318 *or* OCTAFLUOROCYCLOBUTANE	2.2			P5	A6.4.
	UN3337	REFRIGERANT GAS R404A	2.2			P5	A6.3., A6.4.
	UN3338	REFRIGERANT GAS R407A	2.2			P5	A6.3., A6.4.
	UN3339	REFRIGERANT GAS R407B	2.2			P5	A6.3., A6.4.
	UN3340	REFRIGERANT GAS R407C	2.2			P5	A6.3., A6.4.
	UN2602	REFRIGERANT GAS R500 *or* DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE	2.2			P5	A6.3., A6.4.
	UN1973	REFRIGERANT GAS R502 *or* CHLOROPENTAFLUOROETHANE MIXTURE	2.2			P5	A6.3., A6.4.
	UN2599	REFRIGERANT GAS R503 *or* CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE	2.2			P5	A6.3., A6.4.
	UN1959	REFRIGERANT GAS R1132A *or* 1,1-DIFLUOROETHYLENE	2.1			P4	A6.3., A6.4.
	UN1858	REFRIGERANT GAS R1216 *or* HEXAFLUOROPROPYLENE	2.2			P5	A6.3., A6.4.
	UN2422	REFRIGERANT GAS R1318 *or* OCTAFLUOROBUT-2-ENE	2.2			P5	A6.4.
★	UN1078	REFRIGERANT GASES, N.O.S.	2.2			P5	A6.3., A6.4.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
D	NA1954	REFRIGERANT GASES, N.O.S. *or* DISPERSANT GASES, N.O.S.	2.1			P4	A6.3., A6.4.
	UN3358	REFRIGERATING MACHINES, *containing flammable, non-toxic, liquefied gas*	2.1				FORBIDDEN
	UN2857	REFRIGERATING MACHINES, *containing nonflammable non-toxic, liquefied gas or ammonia solutions*	2.2			P5	A6.3., A6.8.
		Refrigerating machines containing toxic liquefied gas or ammonia solution with more than 50% ammonia					FORBIDDEN
	UN3291	REGULATED MEDICAL WASTE N.O.S., *or* CLINICAL WASTE, UNSPECIFIED, N.O.S. *or* (BIO) MEDICAL WASTE, N.O.S. *or* BIOMEDICAL WASTE, N.O.S. *or* MEDICAL WASTE, N.O.S.	6.2		II	P5, A117	A10.10.
	UN0173	RELEASE DEVICES, EXPLOSIVE	1.4S		II	P5, A69	A5.17.
		Resinate of cobalt, precipitated, see COBALT RESINATE, PRECIPITATED					
		Resinates, liquid, see FLAMMABLE LIQUID, N.O.S.					
		Resinates, solid, see FLAMMABLE SOLID, ORGANIC, N.O.S.					
	UN1866	RESIN SOLUTION, *flammable*	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
		Resorcin, see RESORCINOL					
	UN2876	RESORCINOL	6.1		III	P5	A10.5.
		Rifle grenade, see GRENADES, *hand or rifle, etc.*					
		Rifle powder, see POWDER, SMOKELESS					
	UN0174	RIVETS, EXPLOSIVE	1.4S		II	P5, A69	A5.17.
		*Road asphalt or tar liquid,see*TARS, LIQUID, *etc*					
	UN0186	ROCKET MOTORS	1.3C		II	P4, 109	A5.12.
	UN0280	ROCKET MOTORS	1.1C		II	P4, 109	A5.12.
	UN0281	ROCKET MOTORS	1.2C		II	P4, 109	A5.12.
	UN0395	ROCKET MOTORS, LIQUID FUELED	1.2J		II	P3, 109	A5.3.
	UN0396	ROCKET MOTORS, LIQUID FUELED	1.3J		II	P3, 109	A5.3.
	UN0250	ROCKET MOTORS WITH HYPERGOLIC LIQUIDS *with or without an expelling charge*	1.3L		II	P2, 109	A5.3.
	UN0322	ROCKET MOTORS WITH HYPERGOLIC LIQUIDS *with or without an expelling charge*	1.2L		II	P2, 109	A5.3.
	UN0238	ROCKETS, LINE-THROWING	1.2G		II	P4	A5.12.
	UN0240	ROCKETS, LINE-THROWING	1.3G		II	P4	A5.12.
	UN0453	ROCKETS, LINE-THROWING	1.4G		II	P5	A5.12.
	UN0397	ROCKETS, LIQUID FUELED *with bursting charge*	1.1J		II	P3, A500	A5.3.
	UN0398	ROCKETS, LIQUID FUELED *with bursting charge*	1.2J		II	P3, A500	A5.3.
	UN0180	ROCKETS, *with bursting charge*	1.1F		II	P4	A5.12.
	UN0181	ROCKETS, *with bursting charge*	1.1E		II	P4	A5.12.
	UN0182	ROCKETS, *with bursting charge*	1.2E		II	P4	A5.12.
	UN0295	ROCKETS, *with bursting charge*	1.2F		II	P4	A5.12.
	UN0436	ROCKETS, *with expelling charge*	1.2C		II	P4	A5.12.
	UN0437	ROCKETS, *with expelling charge*	1.3C		II	P4	A5.12.
	UN0438	ROCKETS, *with expelling charge*	1.4C		II	P5	A5.12.
	UN0183	ROCKETS, *with inert head*	1.3C		II	P4	A5.12.
	UN0502	ROCKETS, *with inert head*	1.2C		II	P4	A5.12.
	UN1286	ROSIN OIL	3		II III	P5 P5	A7.2. A7.2.
	UN1345	RUBBER SCRAP *or* RUBBER SHODDY, *powdered or granulated, not exceeding 840 microns & rubber Content exceeding 45%*	4.1		II	P5	A8.3

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1287	RUBBER SOLUTION	3		II III	P5 P5	A7.2. A7.2.
	UN1423	RUBIDIUM	4.3		I	P3, 22, A7, A19, N34, N40, N45	A8.3.
	UN2678	RUBIDIUM HYDROXIDE	8		II	P5	A12.3.
	UN2677	RUBIDIUM HYDROXIDE SOLUTION	8		II III	P5 P5	A12.2. A12.2.
		Safety fuse, see FUSE, SAFETY					
		Safety squibs, see IGNITERS					
		Saltpetre, see POTASSIUM NITRATE					
		Sand acid, see FLUOROSILICIC ACID					
★	UN0190	SAMPLES, EXPLOSIVE, *other than initiating explosives*	use class/ division of sample		II	P4, 113	A5.3.
	UN0503	SEAT-BELT PRETENSIONERS	1.4G		II	P5	A5.18.
	UN3268	SEAT-BELT PRETENSIONERS	9		III	P5	A13.15.
		Security type attaché cases, cash boxes/bags, incorporating dangerous goods such as lithium batteries and/or pyrotechnic material					FORBIDDEN
	UN1386	SEED CAKE, *containing vegetable oil solvent extractions and expelled seeds, with not more than 10% of oil and when the amount of moisture is higher than 11%, not more than 20% of oil and moisture combined*	4.2		III	P5, N7	A8.3.
	UN1386	SEED CAKE *with more than 1.5% oil and not more than 11% moisture*	4.2		III	P5, N7	A8.3.
	UN2217	SEED CAKE *with not more than 1.5% oil and not more than 11% moisture*	4.2		III	P5, N7	A8.3.
		Seed expellers, see SEED CAKE					
★	UN2630	SELENATES *or* SELENITES	6.1		I	P5	A10.5.
	UN1905	SELENIC ACID	8		I	P3, N34	A12.3.
	UN3440	SELENIUM COMPOUND, LIQUID, N.O.S.	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3283	SELENIUM COMPOUND, SOLID, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN2657	SELENIUM DISULFIDE	6.1		II	P5	A10.5.
	UN2194	SELENIUM HEXAFLUORIDE	2.3	8		P1, 1	A6.5.
		Selenium nitride					FORBIDDEN
	UN2879	SELENIUM OXYCHLORIDE	8	6.1	I	P3, A3, A6, A7, N34	A12.2.
		Self-defense spray, aerosol, see AEROSOLS, *etc.*					
+, D	NA3334	SELF-DEFENSE SPRAY, NON-PRESSURIZED	9		III	P5, A37	A13.2.
★	UN3188	SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.	4.2	8 8	II III	P4 P5	A8.2. A8.2.
★	UN3185	SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.	4.2	8 8	II III	P4 P5	A8.2. A8.2.
★	UN3186	SELF-HEATING LIQUID, INORGANIC, N.O.S.	4.2		II III	P4 P5	A8.2. A8.2.
★	UN3183	SELF-HEATING LIQUID, ORGANIC, N.O.S.	4.2		II III	P4 P5	A8.2. A8.2.
★	UN3187	SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.	4.2	6.1 6.1	II III	P4 P5	A8.2. A8.2.
★	UN3184	SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.	4.2	6.1 6.1	II III	P4 P5	A8.2. A8.2.
★	UN3192	SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.	4.2	8 8	II III	P5 P5	A8.3. A8.3.
★	UN3126	SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.	4.2	8 8	II III	P5 P5	A8.3. A8.3.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3190	SELF-HEATING SOLID, INORGANIC, N.O.S.	4.2		II III	P5 P5	A8.3. A8.3.
★	UN3088	SELF-HEATING SOLID, ORGANIC, N.O.S.	4.2		II III	P5 P5	A8.3. A8.3.
★	UN3127	SELF-HEATING SOLID, OXIDIZING, N.O.S.	4.2	5.1		P3	A8.4.
★	UN3191	SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.	4.2	6.1 6.1	II III	P5 P5	A8.3. A8.3.
★	UN3128	SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.	4.2	6.1 6.1	II III	P5 P5	A8.3. A8.3.
		Self-inflating passenger restraint systems (air bags) for motor vehicles, see LIFE-SAVING APPLIANCES, SELF-INFLATING *or* AIR BAG INFLATORS *or* SEAT-BELT PRETENSIONERS *or* AIR BAG MODULES					
		Self-propelled vehicle, see VEHICLE, FLAMMABLE GAS POWERED *or* VEHICLE, FLAMMABLE LIQUID POWERED *or* BATTERY-POWERED VEHICLE *or* BATTERY-POWERED EQUIPMENT					
★	UN3221	SELF-REACTIVE LIQUID TYPE B	4.1				FORBIDDEN
★	UN3231	SELF-REACTIVE LIQUID TYPE B, TEMPERATURE CONTROLLED *(specific technical name required)*	4.1				FORBIDDEN
★	UN3223	SELF-REACTIVE LIQUID TYPE C *(specific technical name required)*	4.1		II	P5	A8.7.
★	UN3233	SELF-REACTIVE LIQUID TYPE C TEMPERATURE CONTROLLED *(specific technical name required)*	4.1				FORBIDDEN
★	UN3225	SELF-REACTIVE LIQUID TYPE D *(specific technical name required)*	4.1		II	P5	A8.7.
★	UN3235	SELF-REACTIVE LIQUID TYPE D, TEMPERATURE CONTROLLED *(specific technical name required)*	4.1				FORBIDDEN
★	UN3227	SELF-REACTIVE LIQUID TYPE E *(specific technical name required)*	4.1		II	P5	A8.7.
★	UN3237	SELF-REACTIVE LIQUID TYPE E, TEMPERATURE CONTROLLED *(specific technical name required)*	4.1				FORBIDDEN
★	UN3229	SELF-REACTIVE LIQUID TYPE F *(specific technical name required)*	4.1		II	P5	A8.7.
★	UN3239	SELF-REACTIVE LIQUID TYPE F, TEMPERATURE CONTROLLED *(specific technical name required)*	4.1				FORBIDDEN
		Self-reactive solid type B					FORBIDDEN
		Self-reactive solid type B temperature controlled					FORBIDDEN
★	UN3222	SELF-REACTIVE SOLID TYPE B*(see below for specific technical name)*	4.1		II	P5, 53	(see technical name below for packaging para-graph reference)
		2-Diazo-1-Naphthol-4-sulphonyl chloride					A8.9.
		2-Diazo-1-Naphthol-5-sulphonyl chloride					A8.9.
★	UN3232	SELF-REACTIVE SOLID TYPE B, TEMPERATURE CONTROLLED	4.1		II		FORBIDDEN
★	UN3224	SELF-REACTIVE SOLID TYPE C *(see below for specific technical name)*	4.1		II	P5	(see technical name below for packaging para-graph reference)
		2,2'-Azodi(isobutyronitrile) as a water base paste					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		N,N'-dinitroso-N,N'-dimethyl-terephthalamide, as a paste					A8.6.
		N,N'-dinitrosopentamethylenetetramine					A8.7.
★	UN3234	SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED*(specific technical name required)*	4.1				FORBIDDEN
★	UN3226	SELF-REACTIVE SOLID TYPE D *(see below for specific technical name)*	4.1		II	P5	(see technical name below for packaging para- graph reference)
		1,1'-azodi-(hexahydrobenzonitrile)					A8.7.
		benzene-1,3-disulphohydrazide as a paste					A8.7.
		benzene sulphohydrazide					A8.7.
		2-Diazo-1-Naphtholsulphonic acid ester mixture					
		2,5-Diethoxy-4-(4morpholinyl)-benzene-diazonium sulphate					
		diphenyloxide-4,4'-disulphohydrazide					A8.6.
		4-dipropylaminobenzenediazonium zinc chloride					A8.8.
		4-Methylbenzenesulphonylhydrazide					
		sodium 2-diazo-1-naphthol-4-sulphonate					A8.8.
		sodium 2-diazo-1-naphthol-5-sulphonate					A8.8.
★	UN3236	SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED *(specific technical name required)*	4.1				FORBIDDEN
★	UN3228	SELF-REACTIVE SOLID TYPE E, *(specific technical name required)*	4.1		II	P5	(see technical name below for packaging para- graph reference)
		Acetone-pyrogallol copolymer 2- diazo-1-naphthol-5-sulphonate					A8.8.
		2,5-Dibutoxy-4-(4-morpholinyl)-Benzenediazonium, tetrachlorozincate (2:1)					
		4-(Dimethylamino)-benzenediazonium trichlorozincate (-1)					A8.8.
★	UN3238	SELF-REACTIVE SOLID TYPE E, TEMPERATURE CONTROLLED (*specific technical name required)*	4.1				FORBIDDEN
★	UN3230	SELF-REACTIVE SOLID TYPE F, *(specific technical name required)*	4.1		II	P5	A8.8.
★	UN3240	SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED *(specific technical name required)*	4.1				FORBIDDEN
	UN1288	SHALE OIL	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
		Shaped Charges, commercial, see CHARGES, SHAPED					
	UN0191	SIGNAL DEVICES, HAND	1.4G		II	P5, A69	A5.18.
	UN0373	SIGNAL DEVICES, HAND	1.4S		II	P5, A69	A5.18.
	UN0194	SIGNALS, DISTRESS, *ship*	1.1G		II	P4, A69	A5.18.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN0195	SIGNALS, DISTRESS, *ship*	1.3G		II	P4, A69	A5.18.
	UN0505	SIGNALS, DISTRESS *ship*	1.4G		II	P5, A69	A5.18.
	UN0506	SIGNALS, DISTRESS *ship*	1.4S		II	P5, A69	A5.18.
		Signals, distress, ship, water-activated, see CONTRIVANCES, WATER-ACTIVATED					
		Signals, highway, see SIGNAL DEVICES, HAND					
	UN0192	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.1G		II	P4, A69	A5.18.
	UN0492	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.3G		II	P4, A69	A5.18.
	UN0493	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4G		II	P5, A69	A5.18.
	UN0193	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4S		II	P5, A69	A5.18.
	UN0196	SIGNALS, SMOKE	1.1G		II	P4	A5.18.
	UN0313	SIGNALS, SMOKE	1.2G		II	P4	A5.18.
	UN0487	SIGNALS, SMOKE	1.3G		II	P4	A5.18.
	UN0197	SIGNALS, SMOKE	1.4G		II	P5	A5.18.
	UN0507	SIGNALS, SMOKE	1.4S			P5	A5.18
	UN2203	SILANE	2.1		II	P4	A6.5.
		Silicofluoric acid, see FLUOROSILICIC ACID					
		Silicofluorides, see FLUOROSILICATES, N.O.S.					
		Silicon chloride, see SILICON TETRACHLORIDE					
	UN1346	SILICON POWDER, AMORPHOUS	4.1		III	P5, A1	A8.3.
	UN1818	SILICON TETRACHLORIDE	8		II	P5, A3, A6	A12.2.
	UN1859	SILICON TETRAFLUORIDE	2.3	8		P2, 2	A6.6.
		Silver acetylide (dry)					FORBIDDEN
	UN1683	SILVER ARSENITE	6.1		II	P5	A10.5.
		Silver azide (dry)					FORBIDDEN
		Silver chlorite (dry)					FORBIDDEN
	UN1684	SILVER CYANIDE	6.1		II	P5	A10.5.
		Silver fulminate (dry)					FORBIDDEN
	UN1493	SILVER NITRATE	5.1		II	P5	A9.6.
		Silver oxadate (dry)					FORBIDDEN
		Silver picrate (dry)					FORBIDDEN
	UN1347	SILVER PICRATE, WETTED, *with not less than 30% water, by mass*	4.1		I	P3	A8.3.
		Silver picrate, wetted with less than 30% water, by weight					FORBIDDEN
		Sisal, see FIBRES, SYNTHETIC, N.O.S. *or* FIBRES, VEGETABLE, N.O.S. *or* FIBRES, ANIMAL, N.O.S.					
	UN1906	SLUDGE, ACID	8		II	P5, A3, A7, N34	A12.2.
D	NA3178	SMOKELESS POWDER FOR SMALL ARMS *(100 pounds or less)*	4.1		I	P4	A8.17.
	UN1907	SODA LIME *with more than 4% sodium hydroxide*	8		III	P5	A12.3.
	UN1428	SODIUM	4.3		I	P3, A7, A8, A19, A20, N34	A8.3.
	UN2812	SODIUM ALUMINATE, SOLID	8		III	P5	A12.3.
	UN1819	SODIUM ALUMINATE, SOLUTION	8		II III	P5 P5	A12.2. A12.2.
	UN2835	SODIUM ALUMINUM HYDRIDE	4.3		II	P5, A8, A19, A20	A8.3.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Sodium amalgam, see ALKALI METAL AMALGAM, LIQUID *or* ALKALI, METAL AMALGAM, SOLID					
		Sodium amide, see ALKALI METAL AMIDES					
	UN2863	SODIUM AMMONIUM VANADATE	6.1		II	P5	A10.5.
	UN2473	SODIUM ARSANILATE	6.1		III	P5	A10.5.
	UN1685	SODIUM ARSENATE	6.1		II	P5	A10.5.
	UN1686	SODIUM ARSENITE, AQUEOUS SOLUTIONS	6.1		II III	P5 P5	A10.4. A10.4.
	UN2027	SODIUM ARSENITE, SOLID	6.1		II	P5	A10.5.
	UN1687	SODIUM AZIDE	6.1		II	P5	A10.5.
		Sodium bifluoride, see SODIUM HYDROGENDIFLUORIDE, SOLID *or* SODIUM HYDROGENDIFLUORIDE SOLUTION					
		Sodium binoxide, see SODIUM PEROXIDE					
		Sodium bisulfates, see BISULFATES AQUEOUS SOLUTION					
		Sodium bisulfites, solution, see BISULFITES, AQUEOUS SOLUTIONS N.O.S					
	UN1426	SODIUM BOROHYDRIDE	4.3		I	P3, N40	A8.3.
	UN3320	SODIUM BOROHYDRIDE AND SODIUM HYDROXIDE SOLUTION *with no more than 12% sodium borohydride and not more than 40% sodium hydroxide by mass*	8		II III	P5, N34 P5, N34	A12.2. A12.2.
	UN1494	SODIUM BROMATE	5.1		II	P5	A9.6.
	UN1688	SODIUM CACODYLATE	6.1		II	P5	A10.5.
	UN3378	SODIUM CARBONATE PEROXYHYDRATE	5.1		II III	P5 P5	A9.6 A9.6
	UN1495	SODIUM CHLORATE	5.1		II	P5, A9, N34	A9.6.
	UN2428	SODIUM CHLORATE, AQUEOUS SOLUTION	5.1		II III	P5, A2 P5, A2	A9.5. A9.5.
		Sodium chlorate mixed with dinitrotoluene, see EXPLOSIVE BLASTING TYPE C					
	UN1496	SODIUM CHLORITE	5.1		II	P5, A9, N34	A9.6.
		Sodium chlorite solution, see CHLORITE SOLUTION					
	UN2659	SODIUM CHLOROACETATE	6.1		III	P5	A10.5.
	UN2316	SODIUM CUPROCYANIDE, SOLID	6.1		I	P5	A10.5.
	UN2317	SODIUM CUPROCYANIDE, SOLUTION	6.1		I	P3	A10.4.
	UN1689	SODIUM CYANIDE, SOLID	6.1		I	P5, N74, N75	A10.5.
	UN3414	SODIUM CYANIDE, SOLUTION	6.1		I II III	P5, N74, N75 P5, N74, N75 P5, N74, N75	A10.4 A10.4 A10.4
		Sodium 2-diazo-1-naphthol-4-sulphonate or Sodium 2-diazo-1-naphthol-5-sulphonate, see SELF REACTIVE SOLID TYPE D					
		Sodium dichloroisocyanurate or Sodium dichloro-s-triazine-trione, see DICHLOROISOCYANURIC ACID, *etc.*					
		Sodium dicyanocuprate (I), solid, see SODIUM CUPROCYANIDE, SOLID					
		Sodium dicyanocuprate (I), solution, see SODIUM CUPROCYANIDE, SOLUTION					
		Sodium dimethylarsenate, SODIUM CACODYLATE					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN0234	SODIUM DINITRO-O-CRESOLATE, *dry or wetted, with less than 15% water, by mass*	1.3C		II	P4	A5.9.
	UN3369	SODIUM DINITRO-O-CRESOLATE, WETTED, *with more than 10% but less than 15% water, by weight*	4.1		I	P4, 23, A8, A19, A20,N41	A8.3.
	UN1348	SODIUM DINITRO-O-CRESOLATE, WETTED, *with not less than 15% water, by mass*	4.1	6.1	I	P4, 23, A8, A19, A20,N41	A8.3.
	UN1384	SODIUM DITHIONITE *or* SODIUM HYDROSULFITE	4.2		II	P5, A19, A20	A8.3.
	UN1690	SODIUM FLUORIDE, SOLID	6.1		III	P5	A10.5.
	UN3415	SODIUM FLUORIDE, SOLUTION	6.1		III	P5	A10.4
	UN2629	SODIUM FLUOROACETATE	6.1		I	P5	A10.5.
	UN2674	SODIUM FLUOROSILICATE	6.1		III	P5	A10.5.
		Sodium hexafluorosilicate, see SODIUM FLUOROSILICATE					
		Sodium hydrate solid, see SODIUM HYDROXIDE, SOLID					
		Sodium hydrate solution, see SODIUM HYDROXIDE, SOLUTION					
	UN1427	SODIUM HYDRIDE	4.3		I	P3, A19, N40	A8.3.
		Sodium hydrogen 4-aminophenylarsenate, see SODIUM ARSANILATE					
	UN2439	SODIUM HYDROGENDIFLUORIDE, SOLUTION *or* SODIUM HYDROGENDIFLUORIDE SOLID	8		II	P5, N3, N34	A12.2., A12.3.
		Sodium hydrogen sulfate solution, see BISULFATES, AQUEOUS SOLUTION					
		Sodium hydrogen sulfite solution, see BISULFITES, AQUEOUS SOLUTION					
	UN2318	SODIUM HYDROSULFIDE, *with less than 25% water of crystallization*	4. 2		II	P5, A7, A19, A20	A8.3.
	UN2949	SODIUM HYDROSULFIDE, *with not less than 25% water of crystallization*	8		II	P5, A7	A12.3.
	UN1384	SODIUM HYDROSULFITE *or* SODIUM DITHIONITE	4.2		II	P5, A19, A20	A8.3.
	UN1823	SODIUM HYDROXIDE, SOLID	8		II	P5	A12.3.
	UN1824	SODIUM HYDROXIDE, SOLUTION	8		II III	P5, N34 P5, N34	A12.2. A12.2.
		Sodium hypochlorite, solution, see HYPOCHLORITE SOLUTIONS, *etc.*					
		Sodium metal, liquid alloy, see ALKALI METAL ALLOYS, N.O.S.					
		Sodium metasilicate pentahydrate, see DISODIUM TRIOXOSILICATE					
	UN1431	SODIUM METHYLATE	4.2	8	II	P5, A7, A19	A8.3.
	UN1289	SODIUM METHYLATE SOLUTIONS *in alcohol*	3	8 8	II III	P5 P5	A7.2. A7.2.
	UN1825	SODIUM MONOXIDE	8		II	P5	A12.3.
	UN1498	SODIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
	UN1499	SODIUM NITRATE AND POTASSIUM NITRATE MIXTURES	5.1		III	P5, A1, A29	A9.6.
	UN1500	SODIUM NITRITE	5.1	6.1	III	P5, A1, A29	A9.6.
		Sodium nitrite and potassium nitrate mixture, see POTASSIUM NITRATE AND SODIUM NITRITE MIXTURE					
	UN2567	SODIUM PENTACHLOROPHENATE	6.1		II	P5	A10.5.
	UN3377	SODIUM PERBORATE MONOHYDRATE	5.1		III	P5, 27, A1, A29	A9.6.
	UN1502	SODIUM PERCHLORATE	5.1		II	P5	A9.6.
	UN1503	SODIUM PERMANGANATE	5.1		II	P5	A9.6.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1504	SODIUM PEROXIDE	5.1		I	P3, A20, N34	A9.6.
	UN3247	SODIUM PEROXOBORATE, ANHYDROUS	5.1		II	P5	A9.6.
	UN1505	SODIUM PERSULFATE	5.1		III	P5, A1	A9.6.
		Sodium phenolate, solid, see PHENOLATES, SOLID					
	UN1432	SODIUM PHOSPHIDE	4.3	6.1	I	P3, A19, N40	A8.3.
	UN0235	SODIUM PICRAMATE, *dry or wetted, with less than 20% water, by mass*	1.3C		II	P3	A5.9.
	UN1349	SODIUM PICRAMATE, WETTED, *with not less than 20% water, by mass*	4.1		I	P4, 23, A8, A19, N41	A8.3.
		Sodium picryl peroxide					FORBIDDEN
		Sodium potassium alloys, see POTASSIUM SODIUM ALLOYS					
		Sodium selenate or selenite, see SELENATES *or* SELENITES					
		Sodium silicofluoride, see SODIUM FLUOROSILICATE					
		Sodium sulfate acid solution, see BISULFATES, AQUEOUS SOLUTION					
	UN1385	SODIUM SULFIDE, ANHYDROUS *or* SODIUM SULFIDE *with less than 30% water of crystallization*	4.2		II	P5, A19, A20, N34	A8.3.
	UN1849	SODIUM SULFIDE, HYDRATED *with not less than 30% water*	8		II	P5	A12.3.
	UN2547	SODIUM SUPEROXIDE	5.1		I	P5, A20, N34	A9.6.
		Sodium tetranitride					FORBIDDEN
★	UN3244	SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.	8		II	P5, 49	A12.3.
★	UN3175	SOLIDS CONTAINING FLAMMABLE LIQUID, N.O.S.	4.1		II	P5, 47	A8.3.
		Solvents, flammable, n.o.s., see FLAMMABLE LIQUID, N.O.S.					
		Solvents, flammable, toxic, n.o.s., see FLAMMABLE LIQUID, TOXIC, N.O.S.					
★	UN3243	SOLIDS CONTAINING TOXIC LIQUID, N.O.S.	6.1		II	P5, 48	A10.5.
	UN0374	SOUNDING DEVICES, EXPLOSIVE	1.1D		II	P4	A5.17.
	UN0296	SOUNDING DEVICES, EXPLOSIVE	1.1F		II	P4	A5.17.
	UN0375	SOUNDING DEVICES, EXPLOSIVE	1.2D		II	P4	A5.17.
	UN0204	SOUNDING DEVICES, EXPLOSIVE	1.2F		II	P4	A5.17.
		Spirits of salts, see HYDROCHLORIC ACID					
		Squibs, see IGNITERS					
		Stain, see PAINT					
	UN1827	STANNIC CHLORIDE, ANHYDROUS	8		II	P5	A12.2.
	UN2440	STANNIC CHLORIDE, PENTAHYDRATE	8		III	P5	A12.3.
	UN1433	STANNIC PHOSPHIDES	4.3	6.1	I	P3, A19, N40	A8.3.
		Steel swarf, see FERROUS METAL SHAVINGS *or* FERROUS METAL TURNINGS *or* FERROUS METAL CUTTINGS *or* FERROUS METAL BORINGS					
	UN2676	STIBINE	2.3	2.1		P1, 1	A6.4.
		Storage batteries, wet, see BATTERIES, *wet, etc.*					
		Strontium alloy, see ALKALINE EARTH METAL ALLOY, N.O.S.					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Strontium alloy, pyrophoric, see PYROPHORIC METAL, N.O.S. *or* PYROPHORIC ALLOY, N.O.S.					
	UN1691	STRONTIUM ARSENITE	6.1		II	P5	A10.5.
	UN1506	STRONTIUM CHLORATE	5.1		II	P5, A1, A9, N34	A9.6.
		Strontium dioxide, see STROTIUM PEROXIDE					
	UN1507	STRONTIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
	UN1508	STRONTIUM PERCHLORATE	5.1		II	P5	A9.6.
	UN1509	STRONTIUM PEROXIDE	5.1		II	P5	A9.6.
	UN2013	STRONTIUM PHOSPHIDE	4.3	6.1	I	P3, A19, N40	A8.3.
	UN1692	STRYCHNINE *or* STRYCHNINE SALTS	6.1		I	P5	A10.5.
	UN0219	STYPHNIC ACID *or* TRINITRORESORCINOL *dry or wetted with no more than 20% water, or mixture of alcohol and water, by weight*	1.1D		II	P4	A5.6.
	UN0394	STYPHNIC ACID, WETTED *with more than 20% water, or mixture of alcohol and water, by weight*	1.1D		II	P4	A5.6.
	UN2055	STYRENE MONOMER, STABILIZED	3		III	P5	A7.2.
		Styrene monomer, unstabilized					FORBIDDEN
★	UN0482	SUBSTANCES EVI, N.O.S. *or* SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE, N.O.S.	1.5D		II	P5	A5.3.
★	UN0473	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1A		II	P3, 111	A5.3.
★	UN0474	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1C		II	P4	A5.3.
★	UN0475	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1D		II	P4	A5.3.
★	UN0476	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1G		II	P4	A5.3.
★	UN0357	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1L		II	P3	A5.3.
★	UN0358	SUBSTANCES, EXPLOSIVE, N.O.S.	1.2L		II	P3	A5.3.
★	UN0477	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3C		II	P4	A5.3.
★	UN0478	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3G		II	P4	A5.3.
★	UN0359	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3L		II	P3	A5.3.
★	UN0479	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4C		II	P5	A5.3.
★	UN0480	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4D		II	P5	A5.3.
★	UN0485	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4G		II	P5	A5.3.
★	UN0481	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4S		II	P5, A69	A5.3.
★	UN0482	SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE, N.O.S. *or* SUBSTANCES EVI, N.O.S.	1.5D		II	P5	A5.3.
		Substances liable to spontaneous combustion, n.o.s., see PYROPHORIC LIQUID, ORGANIC, N.O.S. *or* PYROPHORIC SOLID, ORGANIC, N.O.S. *or* SELF-HEATING SOLID, ORGANIC, N.O.S. *or* HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURE STABILIZED *or* SELF-HEATING LIQUID, ORGANIC, N.O.S. *or* SELF-HEATING LIQUID, INORGANIC, N.O.S. *or* PYROPHORIC LIQUID INORGANIC, N.O.S. *or* PYROPHORIC LIQUID INORGANIC, SOLID, N.O.S.					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Substances which in contact with water emit flammable gases, see WATER-REACTIVE SOLID, N.O.S. *or* WATER-REACTIVE LIQUID, CORROSIVE, N.O.S. *or* WATER-REACTIVE LIQUID, TOXIC, N.O.S. *or* WATER-REACTIVE SOLID, CORROSIVE, N.O.S. *or* WATER-REACTIVE SOLID, FLAMMABLE, N.O.S. *or* WATER-REACTIVE SOLID, OXIDIZING, N.O.S. *or* WATER-REACTIVE SOLID, TOXIC, N.O.S. *or* WATER-REACTIVE SOLID, SELF-HEATING, N.O.S. *or* WATER-REACTIVE LIQUID, N.O.S.					
★	UN2780	SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, FLAMMABLE, TOXIC *flashpoint less than 23 degrees C*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3014	SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3013	SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, TOXIC, FLAMMABLE *flashpoint not less than 23 degrees C*	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2779	SUBSTITUTED NITROPHENOL PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Sucrose octanitrate (dry)					FORBIDDEN
	UN2967	SULPHAMIC ACID	8		III	P5	A12.3.
D	NA1350	SULFUR	9		III	P5	A13.2.
	UN1350	SULFUR	4.1		III	P5, 30	A8.3.
		Sulfur and chlorate, loose mixtures of					FORBIDDEN
	UN1828	SULFUR CHLORIDES	8		I	P2, 5, A3, A7, A10, N34	A12.2.
		Sulfur dichloride, see SULFUR CHLORIDES					
	UN1079	SULFUR DIOXIDE	2.3	8		P2, 3	A6.4.
		Sulfur dioxide solution, see SULFURUS ACID					
		Sulfuretted hydrogen, see HYDROGEN SULFIDE					
	UN1080	SULFUR HEXAFLUORIDE	2.2			P5	A6.3., A6.4.
D	NA2448	SULFUR, MOLTEN	9				FORBIDDEN
	UN2448	SULFUR, MOLTEN	4.1				FORBIDDEN
	UN2418	SULFUR TETRAFLUORIDE	2.3	8		P1, 1	A6.5.
+	UN1829	SULFUR TRIOXIDE, STABILIZED	8	6.1	I	P2, 2, A7, N34	A12.11.
		Sulfur trioxide, unstabilized					FORBIDDEN
		Sulfuretted hydrogen, see HYDROGEN SULFIDE					
	UN1830	SULFURIC ACID *with more than 51% acid*	8		II	P4, A3, A7, N34	A12.2.
	UN2796	SULFURIC ACID, *not more than 51% acid*	8		II	P5, A3, A7 N6, N34	A12.2.
		Sulfuric and hydrofluoric acid mixture, see HYDROFLURIC AND SULFURIC ACID MIXTURES					
		Sulfuric anhydride, see SULFUR TRIOXIDE, STABILIZED					
+	UN1831	SULFURIC ACID, FUMING *with less than 30% free sulfur trioxide*	8		I	P3, A3, A7, N34	A12.11.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1831	SULFURIC ACID, FUMING *with 30% or more free sulfur trioxide*	8	6.1			FORBIDDEN
	UN1832	SULFURIC ACID, SPENT	8		II	P4, A3, A7, N34	A12.2.
		Sulfuric acid, unstable					FORBIDDEN
		Sulfuric and hydrofluoric acid mixture, see HYDROFLUORIC ACID AND SULFURIC ACID MIXTURE					
		Sulfuric anhydride, see SULFUR TRIOXIDE STABILIZED					
	UN1833	SULFUROUS ACID	8		II	P5	A12.2.
+	UN1834	SULFURYL CHLORIDE	6.1	8	I	P1, 1, A3, N34	A12.11.
	UN2191	SULFURYL FLUORIDE	2.3			P2, 4	A6.4.
		Talcum with tremolite and/or actinolite, see WHITE ASBESTOS					
	UN1999	TARS, LIQUID, *including road oils, and cut back bitumens*	3		II III	P5 P5	A7.2. A7.2.
		Tartar emetic, see ANTIMONY POTASSIUM TARTRATE					
	UN1700	TEAR GAS CANDLES	6.1	4.1	II	P4	A10.7.
		Tear gas cartridges, see AMMUNITION, TEAR- PRODUCING, *etc*					
D, ★	NA1693	TEAR GAS DEVICES, *with more than 2% tear gas substance, by mass*	6.1		I II	P4 P4	A10.7. A10.7.
		Tear gas devices, with not more than 2 percent tear gas substances, by mass, see AEROSOLS, *etc.*					
		Tear gas grenades, see TEAR GAS CANDLES					
★	UN1693	TEAR GAS SUBSTANCES LIQUID, N.O.S.	6.1		I II	P3 P5	A10.4. A10.4.
★	UN3448	TEAR GAS SUBSTANCES, SOLID, N.O.S.	6.1		I II	P5 P5	A10.5. A10.5.
★	UN3284	TELLURIUM COMPOUND, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN2195	TELLURIUM HEXAFLUORIDE	2.3	8		P1, 1	A6.5.
	UN2319	TERPENE HYDROCARBONS, N.O.S.	3		III	P5	A7.2.
	UN2541	TERPINOLENE	3		III	P5	A7.2.
		Tertiary alcohol, see ALCOHOLS, N.O.S.					
		Tetraazido benzene quinone					FORBIDDEN
	UN2504	TETRABROMOETHANE	6.1		III	P5	A10.4.
		Tetrachlorodinitroethane, see TOXIC SOLID, ORGANIC, N.O.S.					
	UN1702	1,1,2,2-TETRACHLOROETHANE	6.1		II	P5, N36	A10.4.
	UN1897	TETRACHLOROETHYLENE	6.1		III	P5, N36	A10.4.
		Tetrachloromethane, see CARBON TETRACHLORIDE					
		Tetraethylammonium perchlorate (dry)					FORBIDDEN
	UN1704	TETRAETHYL DITHIOPYROPHOSPHATE	6.1		II	P5	A10.5.
	UN1292	TETRAETHYL SILICATE	3		III	P5	A7.2.
		Tetrafluorodichloroethane, see REFRIGERANT GAS R114					
	UN2320	TETRAETYLENEPENTAMINE	8		III	P5	A12.2.
		Tetraethyl lead, see MOTOR FUEL ANTI-KNOCK MIXTURE					
		Tetraethyloxysilane, see TETRAETHYL SILICATE					
	UN3159	1,1,1,2-TETRAFLUOROETHANE *or* REFRIGERANT GAS R134A	2.2			P5	A6.3., A6.4.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1081	TETRAFLUOROETHYLENE, STABILIZED	2.1			P4	A6.3., A6.4.
		Tetrafluoroethylene, unstabilized					FORBIDDEN
	UN1982	TETRAFLUOROMETHANE *or* REFRIGERANT GAS R14	2.2			P5	A6.5.
	UN2498	1,2,3,6-TETRAHYDROBENZALDEHYDE	3		III	P5	A7.2.
	UN2056	TETRAHYDROFURAN	3		II	P5	A7.2.
	UN2943	TETRAHYDROFURFURYLAMINE	3		III	P5	A7.2.
		Tetrahydro-1,4-oxazine, see MORPHOLINE					
	UN2698	TETRAHYDROPHTHALIC ANHYDRIDES *with more than 0.05% of maleic anhydride*	8		III	P5	A12.3.
	UN2410	1,2,3,6-TETRAHYDROPYRIDINE	3		II	P5	A7.2.
	UN2412	TETRAHYDROTHIOPHENE	3		II	P5	A7.2.
		Tetramethoxysilane, see METHYL ORTHOSILICATE					
	UN3423	TETRAMETHYLAMMONIUM HYDROXIDE, SOLID	8		II	P5	A12.3
	UN1835	TETRAMETHYLAMMONIUM HYDROXIDE, SOLUTION	8		II III	P5 P5	A12.2. A12.2
		Tetramethylene, see CYCLOBUTANE					
		Tetramethylene cyanide, see ADIPONITRILE					
		Tetramethylene diperoxide dicarbamide					FORBIDDEN
		Tetramethyl lead, see MOTOR FUEL ANTI-KNOCK MIXTURE					
	UN2749	TETRAMETHYLSILANE	3		I	P3, A7	A7.2.
	UN0207	TETRANITROANILINE	1.1D		II	P4	A5.7.
		Tetranitro diglycerin					FORBIDDEN
+	UN1510	TETRANITROMETHANE	6.1	5.1	I		FORBIDDEN
		2,3,4,6-Tetranitrophenol					FORBIDDEN
		2,3,4,6-Tetranitrophenyl methyl nitramine					FORBIDDEN
		2,3,4,6-Tetranitrophenylnitramine					FORBIDDEN
		Tetranitroresorcinol (dry)					FORBIDDEN
		2,3,5,6-Tetranitroso-1,4-dinitrobenzene					FORBIDDEN
		2,3,5,6-Tetranitroso nitrobenzene (dry)					FORBIDDEN
	UN2413	TETRAPROPYLORTHOTITANATE	3		III	P5	A7.2.
		Tetrazine, see GUANYL NITROSAMINOGUANYLTETRAZENE *or* TETRAZINE, WETTED, *etc.*					
		Tetrazine (dry)					FORBIDDEN
	UN0114	TETRAZENE, WETTED *with 30% or more water, or mixture of alcohol and water, by weight or* GUANYL NITROSAMINOGUANYLTETRAZENE, WETTED	1.1A		II	P3, 111, 117	A5.4.
	UN0407	TETRAZOL-1-ACETIC ACID	1.4C			P5	A5.9.
	UN0504	1H-TETRAZOLE	1.1D				FORBIDDEN
		Tetrazolyl azide (dry)					FORBIDDEN
	UN0208	TETRYL *or* TRINITROPHENYLMETHYL-NITRAMINE	1.1D		II	P4	A5.6.
	UN1857	TEXTILE WASTE, WET	4.2		III		FORBIDDEN
	UN2573	THALLIUM CHLORATE	5.1	6.1	II	P5	A9.6.
	UN1707	THALLIUM COMPOUNDS, N.O.S.	6.1		II	P5	A10.5.
		Thallium (I) chlorate, see THALLIUM CHLORATE					
		Thallium (I) nitrate, see THALLIUM NITRATE					
	UN2727	THALLIUM NITRATE	6.1	5.1	II	P5	A10.5.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Thallous Chlorate, see THALLIUM CHLORATE					
		Thermometers, barometers, etc., see MERCURY CONTAINED IN MANUFACTURED ARTICLES					
		Thia-4-pentanal, see 4-THIAPENTANAL					
	UN2785	4-THIAPENTANAL	6.1		III	P5	A10.4.
	UN2436	THIOACETIC ACID	3		II	P5	A7.2.
★	UN2772	THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, *flashpoint less than 23 degrees C*	3	6.1 6.1	I II	P3 P5	A7.2. A7.2.
★	UN3005	THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, *flashpoint not less than 23 degrees C*	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3006	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2771	THIOCARBAMATE PESTICIDE, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Thiocarbonylchloride, see THIOPHOSGENE					
	UN2966	THIOGLYCOL	6.1		II	P5	A10.4.
	UN1940	THIOGLYCOLIC ACID	8		II	P5, A7, N34	A12.2.
	UN2936	THIOLACTIC ACID	6.1		II	P5	A10.5.
	UN1836	THIONYL CHLORIDE	8		I	P3, A7, N34	A12.2.
	UN2414	THIOPHENE	3		II	P5	A7.2.
		Thiophenol, see PHENYL MERCAPTAN					
+	UN2474	THIOPHOSGENE	6.1		I	P2, 2, A7, N33, N34	A10.6.
	UN1837	THIOPHOSPHORYL CHLORIDE	8		II	P4, A3, A7, N34	A12.2.
	UN3341	THIOREA DIOXIDE	4.2		II III	P5 P5	A8.3. A8.3.
		Tin chloride, fuming, see STANNIC CHLORIDE, ANHYDROUS					
		Tin, chloride anhydrous or Tin (IV) chloride anhydrous, see STANNIC CHLORIDE ANHYDROUS					
		Tin, chloride pentahydrate or Tin (IV) pentahydrate, see STANNIC CHLORIDE PENTAHYDRATE					
		Tin perchloride or Tin tetrachloride, see STANNIC CHLORIDE, ANHYDROUS					
	UN1293	TINCTURES, MEDICINAL	3		II III	P5 P5	A7.2. A7.2.
		Tinning flux, see ZINC CHLORIDE					
		Tire assemblies inflated, above maximum rated pressure or Tire assemblies inflated, unserviceable, damaged or above maximum rated pressure					FORBIDDEN
		Tire assemblies inflated, unserviceable, damaged or above maximum rated pressure					FORBIDDEN
	UN3174	TITANIUM DISULPHIDE	4.2		III	P5	A8.3.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1871	TITANIUM HYDRIDE	4.1		II	P5, A19, A20, N34	A8.3.
	UN2546	TITANIUM POWDER, DRY	4.2		I II III	P3 P5, A19, A20, N5, N34 P5	A8.3. A8.3. A8.3.
	UN1352	TITANIUM POWDER, WETTED, *with not less than 25% water (a visible excess of water must be present) (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns)*	4.1		II	P5, A19, A20, N34	A8.3.
	UN2878	TITANIUM SPONGE GRANULES *or* TITANIUM SPONGE POWDERS	4.1		III	P5, A1	A8.3.
+	UN1838	TITANIUM TETRACHLORIDE	6.1	8	I	P2, 2, A3, A6	A12.11.
	UN2869	TITANIUM TRICHLORIDE MIXTURES	8		II III	P5, A7, N34 P5, A7, N34	A12.3. A12.3.
	UN2441	TITANIUM TRICHLORIDE, PYROPHORIC, *or* TITANIUM TRICHLORIDE MIXTURES, PYROPHORIC	4.2	8	I	P3, A7,A8, A19, A20, N34	A8.5.
		TNT mixed with aluminium, see TRITONAL					
	UN0209	TNT *or* TRINITROTOLUENE	1.1D		II	P4, A69	A5.7.
	UN0388	TNT AND HEXANITROSTILBENE MIXTURE *or* TNT AND TRINITROBENZENE MIXTURE	1.1D		II	P4	A5.7.
		TNT mixed with aluminum, see TRITONAL					
	UN0389	TNT MIXTURE CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE	1.1D		II	P4	A5.7.
	UN3366	TNT, WETTED *with more than 10% but less than 30% water, by weight*	4.1		I	P4, A8, A19, N41	A8.3.
		Toe puffs, nitrocellulose base, see FABRICS IMPREGNATED WITH WEAKLY NITRATED NITROLLCELLULOSE, N.O.S.					
	UN1294	TOLUENE	3		II	P5	A7.2.
+	UN2078	TOLUENE DIISOCYANATE	6.1		II	P5	A10.4.
		Toluene sulfonic acid, see ALKYLSULFONIC ACID *or* ARYLSULFONIC ACID, *etc.*					
+	UN1708	TOLUIDINES, LIQUID	6.1		II	P5	A10.4.
	UN3451	TOLUIDINES, SOLID	6.1		II	P5	A10.5.
		Toluol, see TOLUENE					
	UN1709	2,4-TOLUYLENEDIAMINE, SOLID	6.1		III	P5	A10.5.
	UN3418	2,4-TOLUYLENEDIAMINE, SOLUTION	6.1		III	P5	A10.4
		Toluylene diisocyanate, see TOLUENE DIISOCYANATE					
		Toylene diisocyanate, see TOLUENE DIISOCYANATE					
		Tolyethylene, see VINYLTOULENES, STABILIZED					
	UN0451	TORPEDOES, *with bursting charge*	1.1D		II	P4	A5.12.
	UN0329	TORPEDOES, *with bursting charge*	1.1E		II	P4	A5.12.
	UN0330	TORPEDOES, *with bursting charge*	1.1F		II	P4	A5.12.
	UN0449	TORPEDOES, LIQUID FUELED, *with or without bursting charge*	1.1J		II	P3	A5.3.
	UN0450	TORPEDOES, LIQUID FUELED, *with inert head*	1.3J		II	P3	A5.3.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3381	TOXIC BY INHALATION LIQUID, N.O.S. *with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}*	6.1				FORBIDDEN
★	UN3382	TOXIC BY INHALATION LIQUID, N.O.S. *with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}*	6.1				FORBIDDEN
★	UN3383	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. *with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}*	6.1	3			FORBIDDEN
★	UN3384	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. *with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}*	6.1	3			FORBIDDEN
★	UN3488	TOXIC BY INHALATION LIQUID, FLAMMABLE, CORROSIVE N.O.S. *with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapor concentration greater than or equal to 500 LC_{50}*	6.1	3,8			FORBIDDEN
★	UN3489	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. *with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapor concentration greater than or equal to 10 LC_{50}*	6.1	3,8			FORBIDDEN
★	UN3385	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. *with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}*	6.1	4.3			FORBIDDEN
★	UN3386	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. *with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}*	6.1	4.3			FORBIDDEN
★	UN3490	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE N.O.S. *with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}*	6.1	4.3, 3			FORBIDDEN
★	UN3491	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE N.O.S. *with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}*	6.1	4.3, 3			FORBIDDEN

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN3387	TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. *with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}*	6.1	5.1			FORBIDDEN
★	UN3388	TOXIC BY INHALATION LIQUID, OXIDIZING N.O.S. *with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}*	6.1	5.1			FORBIDDEN
★	UN3389	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. *with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}*	6.1	8			FORBIDDEN
★	UN3390	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. *with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}*	6.1	8			FORBIDDEN
★	UN3492	TOXIC BY INHALATION LIQUID, CORROSIVE, FLAMMABLE N.O.S. *with an inhalation toxicity less than or equal to 200 mL/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}*	6.1	8, 3			FORBIDDEN
★	UN3493	TOXIC BY INHALATION LIQUID, CORROSIVE, FLAMMABLE N.O.S. *with an inhalation toxicity less than or equal to 1000 mL/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}*	6.1	8, 3			FORBIDDEN
		Toxic gas, n.o.s., see COMPRESSED GAS, FLAMMABLE, N.O.S. *or* COMPRESSED GAS, TOXIC, N.O.S. *or* LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S. *or* LIQUEFIED GAS, TOXIC, N.O.S. *or* COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S. *or* COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. *or* COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. *or* COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S. *or* LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S. *or* LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S. *or* LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S. *or* LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.					
★	UN3289	TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.	6.1	8 8	I II	P3 P4	A10.4. A10.4.
★	UN3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2927	TOXIC LIQUIDS, CORROSIVE, ORGANIC, N.O.S.	6.1	8 8	I II	P3 P4	A10.4. A10.4.
★	UN2929	TOXIC LIQUIDS, FLAMMABLE, ORGANIC, N.O.S.	6.1	3 3	I II	P3 P4	A10.4. A10.4.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
★	UN2810	TOXIC LIQUIDS, ORGANIC, N.O.S.	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3122	TOXIC LIQUIDS, OXIDIZING, N.O.S.	6.1	5.1 5.1	I II	P3, A4 P4	A10.4. A10.4.
★	UN3123	TOXIC LIQUIDS, WATER-REACTIVE, N.O.S.	6.1	4.3 4.3	I II	P3, A4 P4	A10.4. A10.4.
★	UN3290	TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.	6.1	8 8	I II	P5 P5	A10.5. A10.5.
★	UN2928	TOXIC SOLIDS, CORROSIVE, ORGANIC, N.O.S.	6.1	8 8	I II	P5 P5	A10.5. A10.5.
★	UN2930	TOXIC SOLIDS, FLAMMABLE, ORGANIC, N.O.S.	6.1	4.1 4.1	I II	P5 P5	A10.5. A10.5.
★	UN3288	TOXIC SOLID, INORGANIC, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
★	UN2811	TOXIC SOLIDS, ORGANIC, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
★	UN3086	TOXIC SOLIDS, OXIDIZING, N.O.S.	6.1	5.1 5.1	I II	P5 P5	A10.5. A10.5.
★	UN3124	TOXIC SOLIDS, SELF-HEATING, N.O.S.	6.1	4.2 4.2	I II	P5, A5 P5	A10.5. A10.5.
★	UN3125	TOXIC SOLIDS, WATER-REACTIVE, N.O.S.	6.1	4.3 4.3	I II	P5, A5 P5	A10.5. A10.5.
★	UN3172	TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.	6.1		I II III	P3, A43 P4, A43 P5, A43	A10.4. A10.4. A10.4.
★	UN3462	TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.	6.1		I II III	P5, A43 P5, A43 P5, A43	A10.5. A10.5. A10.5.
D	NA0337	TOY CAPS	1.4S		II	P5	A5.16.
	UN0212	TRACERS FOR AMMUNITION	1.3G		II	P4	A5.16.
	UN0306	TRACERS FOR AMMUNITION	1.4G		II	P5	A5.16.
		Tractors, see VEHICLES, *etc.*					
		Tremolite, see WHITE ASBESTOS					
		Tri-(b-nitroxyethyl) ammonium nitrate					FORBIDDEN
	UN2609	TRIALLYL BORATE	6.1		III	P5	A10.4.
	UN2610	TRIALLYLAMINE	3	8	III	P5	A7.2.
★	UN2764	TRIAZINE PESTICIDES, LIQUID, FLAMMABLE, TOXIC, *flashpoint less than 23 degrees C*	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN2998	TRIAZINE PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2997	TRIAZINE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, *flashpoint not less than 23 degrees C*	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2763	TRIAZINE PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Tribromoborane, see BORON TRIBROMIDE					
	UN2542	TRIBUTYLAMINE	6.1		II	P5	A10.4.
	UN3254	TRIBUTYLPHOSPHANE	4.2		I	P3	A8.3.
		Trichloroaceticaldehyde, see CHLORAL, ANHYDROUS, STABILIZED					
	UN1839	TRICHLOROACETIC ACID	8		II	P5, A7, N34	A12.3.
	UN2564	TRICHLOROACETIC ACID, SOLUTION	8		II III	P5, A3, A6, A7, N34 P5, A3, A6 A7, N34	A12.2. A12.2.
+	UN2442	TRICHLOROACETYL CHLORIDE	8	6.1	II	P2, 2, A3, A7, N34	A12.11.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN2321	TRICHLOROBENZENES, LIQUID	6.1		III	P5	A10.4.
	UN2322	TRICHLOROBUTENE	6.1		II	P5	A10.4.
	UN2831	1,1,1-TRICHLOROETHANE	6.1		III	P5, N36	A10.4.
	UN1710	TRICHLOROETHYLENE	6.1		III	P5, N36	A10.4.
	UN2468	TRICHLOROISOCYANURIC ACID, DRY	5.1		II	P5	A9.6.
		Trichloromethyl perchlorate					FORBIDDEN
		Trichloronitromethane, see CHLOROPICRIN					
	UN1295	TRICHLOROSILANE	4.3	3, 8	I	P3, A7, N34	A8.2.
		1,3,5-Trichloro-s-triazine-2,4,6-trione, see TRICHLOROISOCYANURIC ACID, DRY					
		2,4,6-Trichloro-1,3,5-triazine, see CYANURIC CHLORIDE					
		Trichloro-s-triazinetrione dry, containing over 39% available chlorine, see TRICHLOROISOCYANURIC ACID, DRY					
	UN2574	TRICRESYL PHOSPHATE *with more than3% ortho isomer*	6.1		II	P5, A3, N33, N34	A10.4.
	UN2323	TRIETHYL PHOSPHITE	3		III	P5	A7.2.
	UN1296	TRIETHYLAMINE	3	8	II	P4	A7.2.
		Triethyl borate, see ETHYL BORATE					
	UN2259	TRIETHYLENETETRAMINE	8		II	P5	A12.2.
		Triethylmethyl lead mixture, see MOTOR FUEL ANTI-KNOCK MIXTURE					
		Triethyl orthoformate, see ETHYL ORTHOFORMATE					
	UN2699	TRIFLUOROACETIC ACID	8		I	P3, A3, A6, A7, N3, N34, N36	A12.2.
	UN3057	TRIFLUOROACETYL CHLORIDE	2.3	8		P2, 2	A6.4.
		Trifluorobromomethane, see BROMOTRIFLUOROMETHANE					
		Trifluorochloroethane, see 1-CHLORO-2,2,2-TRIFLUOROETHANE					
	UN1082	TRIFLUOROCHLOROETHYLENE, STABILIZED	2.3	2.1		P2, 3	A6.3., A6.4.
		Trifluorochloromethane, see CHLOROTRIFLUOROMETHANE					
	UN1984	TRIFLUOROMETHANE *or* REFRIGERANT GAS R23	2.2			P5	A6.3., A6.4.
	UN3136	TRIFLUOROMETHANE, REFRIGERATED LIQUID	2.2			P4	A6.3., A6.11.
	UN2035	1,1,1-TRIFLUOROETHANE, COMPRESSED *or* REFRIGERANT GAS R143A	2.1			P4	A6.3., A6.4.
	UN2942	2-TRIFLUOROMETHYLANILINE	6.1		III	P5	A10.4.
	UN2948	3-TRIFLUOROMETHYLANILINE	6.1		II	P5	A10.4.
		Triformoxime trinitrate					FORBIDDEN
	UN2324	TRIISOBUTYLENE	3		III	P5	A7.2.
	UN2616	TRIISOPROPYL BORATE	3		II III	P5 P5	A7.2. A7.2.
D	NA9269	TRIMETHOXYSILANE	6.1	3	I	P2, 2	A10.6.
	UN2416	TRIMETHYL BORATE	3		II	P5	A7.2.
		Trimethyl carbonyl, see BUTANOLS					
	UN2329	TRIMETHYL PHOSPHITE	3		III	P5	A7.2.
		1,3,5-Trimethyl-2,4,6-trinitrobenzene					FORBIDDEN
		Trimethyoxy silane					FORBIDDEN
		Trinitroacetic acid					FORBIDDEN
		Trinitroacetonitrile					FORBIDDEN
		Trinitroamine cobalt					FORBIDDEN

Table A4.1 (1)	UN/ID NUMBER (2)	PROPER SHIPPING NAME/ DESCRIPTION (3)	HAZARD CLASS/ DIV (4)	SUBSIDIARY RISK (5)	PG (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	UN2438	TRIMETHYLACETYL CHLORIDE	6.1	8, 3	I	P2, 2, A3, A6, A7, N34	A12.11.
	UN1083	TRIMETHYLAMINE, ANHYDROUS	2.1			P4, N87	A6.3., A6.4.
	UN1297	TRIMETHYLAMINE, AQUEOUS SOLUTIONS *not more than 50% trimethylamine, by mass*	3	8 8 8	I II III	P3 P4 P5	A7.2. A7.2. A7.2.
	UN2325	1,3,5-TRIMETHYLBENZENE	3		III	P5	A7.2.
	UN1298	TRIMETHYLCHLOROSILANE	3	8	II	P5, A3, A7, N34	A7.2.
	UN2326	TRIMETHYLCYCLOHEXYLAMINE	8		III	P5	A12.2.
		Trimethylenechlorobromide, see 1-BROMO-3-CHLOROPROPANE					
		Trimethylene glycol diperchlorate					FORBIDDEN
	UN2328	TRIMETHYLHEXAMETHYLENE DIISOCYANATE	6.1		III	P5	A10.4.
		Trimethylol nitromethane trinitrate					FORBIDDEN
		2,4,4-Trimethylpentene-2 or 2,4,4-Trimethylpentene-1, see DIISOBUTYLENE, ISOMERIC COMPOUND					
	UN2327	TRIMETHYLHEXAMETHYL-ENEDIAMINES	8		III	P5	A12.2.
	UN0216	TRINITRO-M-CRESOL	1.1D		II	P4	A5.7.
		2,4,6-Trinitro-1,3-diazobenzene					FORBIDDEN
		2,4,6-Trinitro-1,3,5-triazido benzene (dry)					FORBIDDEN
		Trinitroacetic acid					FORBIDDEN
		Trinitroacetoneitrile					FORBIDDEN
		Trinitroamine cobalt					FORBIDDEN
		Trinitroethanol					FORBIDDEN
		Trinitroethylnitrate					FORBIDDEN
	UN0153	TRINITROANILINE *or* PICRAMIDE	1.1D		II	P4	A5.7.
	UN0213	TRINITROANISOLE	1.1D		II	P4	A5.7.
	UN3365	TRINITROCHLOROBENZENE, WETTED (pycryl chloride) *with not less than 10% water, by mass*	4.1		I	P4, A8, A19, N41	A8.3.
	UN3367	TRINITROBENZENE, WETTED *with not less than 10% water, by mass*	4.1		I	P4, A8, A19, N41	A8.3.
	UN0214	TRINITROBENZENE, *dry or wetted, with less than 30% water, by mass*	1.1D		II	P4	A5.6.
	UN1354	TRINITROBENZENE, WETTED *with not less than 30% water, by mass*	4.1		I	P4, 23, A2, A8, A19, N41	A8.3.
	UN0386	TRINITROBENZENESULPHONIC ACID	1.1D		II	P4	A5.7.
	UN0215	TRINITROBENZOIC ACID, *dry or wetted with less than 30% water, by mass*	1.1D		II	P4	A5.6.
	UN3688	TRINITROBENZOIC ACID, WETTED *with not less than 10% water, by mass*	4.1		I	P4, A8, A19, N41	A8.3.
	UN1355	TRINITROBENZOIC ACID, WETTED *with not less than 30% water, by mass*	4.1		I	P4, 23, A2, A8, A19, N41	A8.3.
	UN0155	TRINITROCHLOROBENZENE *or* PICRYL CHLORIDE	1.1D		II	P4	A5.7.
	UN0387	TRINITROFLUORENONE	1.1D		II	P4	A5.7.
		Trinitromethane					FORBIDDEN
		1,3,5-Trinitronaphthalene					FORBIDDEN
	UN0217	TRINITRONAPHTHALENE	1.1D		II	P4	A5.7.
	UN0218	TRINITROPHENETOLE	1.1D		II	P4	A5.7.
	UN0154	TRINITROPHENOL *or* PICRIC ACID, *dry or wetted with less than 30% water, by mass*	1.1D		II	P4	A5.6.
	UN3364	TRINITROPHENOL *(picric acid)*, WETTED *with not less than 10% water, by mass*	4.1		I	P4, A8, 19, N41	A8.3.
	UN1344	TRINITROPHENOL, WETTED *with not less than 30% water, by mass*	4.1		I	P4, 23, A8, A19, N41	A8.3.
		2,4,6-Trinitrophenyl guanidine (dry)					FORBIDDEN

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN0208	TRINITROPHENYLMETHYL-NITRAMINE *or* TETRYL	1.1D		II	P4	A5.6.
		2,4,6-Trinitrophenyl nitramine					FORBIDDEN
		2,4,6-Trinitrophenyl trimethylol methyl nitramine trinitrate (dry)					FORBIDDEN
	UN0219	TRINITRORESORCINOL *or* STYPHNIC ACID, *dry or wetted with less than 20% water, or mixture of alcohol and water, by mass*	1.1D		II	P4	A5.6.
	UN0394	TRINITRORESORCINOL WETTED *or* STYPHNIC ACID, WETTED *with not less than 20% water, or mixture of alcohol and water, by mass*	1.1D		II	P4	A5.6.
		2,4,6- Trinitroso-3-methyl nitraminoanisole					FORBIDDEN
		Trinitrotetramine cobalt nitrate					FORBIDDEN
	UN0209	TRINITROTOLUENE *or* TNT, (*dry or wetted with less than 30% water, by mass)*	1.1D		II	P4, A69	A5.7.
	UN0388	TRINITROTOLUENE AND TRINITROBENZENE MIXTURES *or* TNT AND TRINITROBENZENE MIXTURES *or* TNT AND HEXANITROSTILBENE MIXTURES *or* TRINITROTOLUENE AND HEXANITROSTILNENE MIXTURES	1.1D		II	P4	A5.7.
	UN0389	TRINITROTOLUENE MIXTURES, CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE *or* TNT MIXTURES CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE	1.1D		II	P4	A5.7.
	UN3366	TRINITROTOLUENE (TNT), WETTED *with not less than 10% but less than 30% water, by mass*	4.1		I	P4, A8, A19, N41	A8.3.
	UN1356	TRINITROTOLUENE WETTED, *with not less than 30% water, by mass*	4.1		I	P4, 23, A2, A8, A19, N41	A8.3.
		2,4,6-Trinitro-1,3,5-triazido benzene (dry)					FORBIDDEN
		Tri-(b-nitroxyethyl) ammonium nitrate					FORBIDDEN
	UN2260	TRIPROPYLAMINE	3	8	III	P5	A7.2.
	UN2057	TRIPROPYLENE	3		II III	P5 P5	A7.2. A7.2.
	UN2501	TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE SOLUTION	6.1		II III	P5 P5	A10.4. A10.4.
		Tris bis-bifluoroamino diethoxy propane (TVOPA)					FORBIDDEN
	UN0390	TRITONAL	1.1D		II	P4	A5.6.
		Tropilidene, see CYCLOHEPTRATRIENE					
		Tungates, liquid, see FLAMMABLE LIQUID, N.O.S.					
		Tungates, solid, see FLAMMABLE SOLID, ORGANIC, N.O.S. *or* FLAMMABLE SOLID, INORGANIC, N.O.S.					
	UN2196	TUNGSTEN HEXAFLUORIDE	2.3	8			FORBIDDEN
	UN1299	TURPENTINE	3		III	P5	A7.2.
	UN1300	TURPENTINE SUBSTITUTE	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
	UN2330	UNDECANE	3		III	P5	A7.2.
	UN1511	UREA HYDROGEN PEROXIDE	5.1	8	III	P5, A1, A7, A29	A9.6.
	UN0220	UREA NITRATE, *dry or wetted with less than 20% water, by mass*	1.1D		II	P4	A5.6.
	UN3370	UREA NITRATE, WETTED *with not less than 10%*	4.1		I	P4, A8, A19, N41	A8.3.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	UN1357	UREA NITRATE, WETTED *with not less than 20% water, by mass*	4.1		I	P4, A8, A19, N41	A8.3.
		Urea peroxide, see UREA HYDROGEN PEROXIDE					
		Valeral or n-Valeraldehyde, see VALERALDEHYDE					
	UN2058	VALERALDEHYDE	3		II	P5	A7.2.
		Valeric acid, see CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.					
	UN2502	VALERYL CHLORIDE	8	3	II	P5, A3, A6, A7, N34	A12.2.
★	UN3285	VANADIUM COMPOUND, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Vanadium (IV) oxide or Vanadium oxysulfate, see VANADYL SULFATE					
	UN2443	VANADIUM OXYTRICHLORIDE	8		II	P5, A3, A6, A7, N34	A12.2.
	UN2862	VANADIUM PENTOXIDE, *nonfused form*	6.1		III	P5	A10.5.
	UN2444	VANADIUM TETRACHLORIDE	8		I	P3, A3, A6, A7, N34	A12.2.
	UN2475	VANADIUM TRICHLORIDE	8		III	P5	A12.3.
	UN2931	VANADYL SULFATE	6.1		II	P5	A10.5.
		Varnish, see PAINT					
		Varnish drier, liquid, see FLAMMABLE LIQUID, N.O.S.					
		Varnish drier solid, see FLAMMABLE SOLID, ORGANIC, N.O.S. *or* FLAMMABLE SOLID, INORGANIC, N.O.S.					
	UN3166	VEHICLE, FLAMMABLE GAS POWERED *or* VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED	9			P5, 135	A13.4.
	UN3166	VEHICLE, FLAMMABLE LIQUID POWERED *or* VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED	9			P5, 135	A13.4.
		Very signal cartridge, see CARTRIDGES SIGNAL					
		Villiaumite, see SODIUM FLUORIDE, SOLID *or* SODIUM FLUORIDE, SOLUTION					
	UN1301	VINYL ACETATE, STABILIZED	3		II	P5	A7.2.
		Vinyl acetate, unstabilized					FORBIDDEN
		Vinyl benzene, see STYRENE MONOMER, STABILIZED					
	UN1085	VINYL BROMIDE, STABILIZED	2.1			P4, N86	A6.3., A6.4.
		Vynyl bromide, unstabilized					FORBIDDEN
	UN2838	VINYL BUTYRATE, STABILIZED	3		II	P5	A7.2.
		Vinyl butyrate, unstabilized					FORBIDDEN
	UN1086	VINYL CHLORIDE, STABILIZED	2.1			P4, 21, N86	A6.3., A6.4.
		Vinyl chloride, unstabilized					FORBIDDEN
	UN2589	VINYL CHLOROACETATE	6.1	3	II	P5	A10.4.
		Vinyl cyanide, see ACRYLONITRILE, STABILIZED					
	UN1302	VINYL ETHYL ETHER, STABILIZED	3		I	P3, A3	A7.2.
		Vinyl ethyl ether, unstabilized					FORBIDDEN
	UN1860	VINYL FLUORIDE, STABILIZED	2.1			P4, N86	A6.3., A6.4.
		Vinyl fluoride, unstabilized					FORBIDDEN
	UN1304	VINYL ISOBUTYL ETHER, STABILIZED	3		II	P5	A7.2.
		Vinyl isobutyl ether, unstabilized					FORBIDDEN
	UN1087	VINYL METHYL ETHER, STABILIZED	2.1			P4	A6.3., A6.4.
		Vinyl methyl ether, unstabilized					FORBIDDEN

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Vinyl nitrate polymer					FORBIDDEN
	UN1303	VINYLIDENE CHLORIDE, STABILIZED	3		I	P3	A7.2.
		Vinylidene chloride, unstabilized					FORBIDDEN
		Vinylidene fluoride, see 1,1-DIFLUOROETHYLENE					
	UN3073	VINYLPYRIDINES, STABILIZED	6.1	3, 8	II	P5	A10.4.
		Vinylpyridines, unstabilized					FORBIDDEN
	UN2618	VINYLTOLUENES, STABILIZED	3		III	P5	A7.2.
		Vinyltoulene, unstabilized					FORBIDDEN
	UN1305	VINYLTRICHLOROSILANE, STABILIZED	3	8	II	P5, A3, A7, N34	A7.2.
		Vinyltrichlorosilane, unstabilized					FORBIDDEN
		Warheads for guided missiles, see WARHEADS, ROCKET					
	UN0370	WARHEADS, ROCKET *with burster or expelling charge*	1.4D		II	P5	A5.12.
	UN0371	WARHEADS, ROCKET *with burster or expelling charge*	1.4F		II	P5	A5.12.
	UN0286	WARHEADS, ROCKET *with bursting charge*	1.1D		II	P4	A5.12.
	UN0287	WARHEADS, ROCKET *with bursting charge*	1.2D		II	P4	A5.12.
	UN0369	WARHEADS, ROCKET *with bursting charge*	1.1F		II	P4	A5.12.
	UN0221	WARHEADS, TORPEDO *with bursting charge*	1.1D		II	P4	A5.12.
★	UN3129	WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.	4.3	8 8 8	I II III	P3 P4 P5	A8.2. A8.2. A8.2.
★	UN3148	WATER-REACTIVE LIQUID, N.O.S.	4.3		I II III	P3 P5 P5	A8.2. A8.2. A8.2.
★	UN3130	WATER-REACTIVE LIQUID, N.O.S.	4.3	6.1 6.1 6.1	I II III	P3, A4 P4 P5	A8.2. A8.2. A8.2.
★	UN3132	WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.	4.3	4.1 4.1 4.1	I II III	P3, N40 P5 P5	A8.3. A8.3. A8.3.
★	UN2813	WATER-REACTIVE SOLID, N.O.S.	4.3		I II III	P3, N40 P5 P5	A8.3. A8.3. A8.3.
★	UN3131	WATER-REACTIVE SOLID, CORROSIVE, N.O.S.	4.3	8 8 8	I II III	P3, N40 P5 P5	A8.3. A8.3. A8.3.
★	UN3133	WATER-REACTIVE SOLID, OXIDIZING, N.O.S.	4.3	5.1 5.1	II III	P3 P5	A8.4. A8.4.
★	UN3135	WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.	4.3	4.2 4.2 4.2	I II III	P3, N40 P5 P5	A8.3. A8.3. A8.3.
★	UN3134	WATER-REACTIVE SOLID, TOXIC, N.O.S.	4.3	6.1 6.1 6.1	I II III	P3, A8, N40 P5 P5	A8.3. A8.3. A8.3.
		Wheelchair, electric with batteries, see BATTERY-POWERED EQUIMENT *or* BATTERY-POWERED VEHICLE					
		White acid, see HYDROFLUORIC ACID					
		White arsenic, see ARSENIC TRIOXIDE					
	UN2590	WHITE ASBESTOS *(Chrysotile, actinolite, anthophyllite, tremolite)*	9		III	P5	A13.16.

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		White spirit, see TURPENTINE SUBSTITUTE					
	UN1306	WOOD PRESERVATIVES, LIQUID	3		II III	P5 P5	A7.2. A7.2.
	UN1387	WOOL WASTE, WET	4.2		III		FORBIDDEN
	UN3342	XANTHATES	4.2		II III	P5 P5	A8.3. A8.3.
	UN2036	XENON	2.2			P5	A6.3., A6.5.
	UN2591	XENON, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2			P4	A6.11.
	UN1307	XYLENES	3		II III	P5 P5	A7.2. A7.2.
	UN3430	XYLENOLS, LIQUID	6.1		II	P5	A10.4
	UN2261	XYLENOLS, SOLID	6.1		II	P5	A10.5.
	UN1711	XYLIDINES, LIQUID	6.1		II	P5	A10.4.
	UN3452	XYLIDINES, SOLID	6.1		II	P5	A10.6.
		Xylols, see XYLENES					
	UN1701	XYLYL BROMIDE, LIQUID	6.1		II	P4, A3, A6, A7, N33	A10.7.
	UN3417	XYLYL BROMIDE, SOLID	6.1		II	P4, A3, A6, A7, N33	A10.7.
		p-Xylyl diazide					FORBIDDEN
	UN1512	ZINC AMMONIUM NITRITE	5.1		II	P5	A9.6.
	UN1712	ZINC ARSENATE *or* ZINC ARSENITE *or* ZINC ARSENATE AND ZINC ARSENITE MIXTURES	6.1		II	P5	A10.5.
	UN1435	ZINC ASHES	4.3		III	P5, A1, A19	A8.3.
		Zinc bisulfite solution, see BISULFITES, AQUEOUS SOLUTIONS, N.O.S.					
	UN2469	ZINC BROMATE	5.1		III	P5, A1, A29	A9.6.
	UN1513	ZINC CHLORATE	5.1		II	P5, A9, N34	A9.6.
	UN2331	ZINC CHLORIDE, ANHYDROUS	8		III	P5	A12.3.
	UN1840	ZINC CHLORIDE, SOLUTION	8		III	P5	A12.2.
	UN1713	ZINC CYANIDE	6.1		I	P5	A10.5.
	UN1931	ZINC DITHIONITE *or* ZINC HYDROSULFITE	9		III	P5	A13.2.
	UN1436	ZINC DUST *or* ZINC DUST	4.3	4.2 4.2 4.2	I II III	P3, A19, N40 P4, A19 P5	A8.3. A8.3. A8.3.
		Zinc ethyl, see DIETHYLZINC					
	UN2855	ZINC FLUOROSILICATE	6.1		III	P5	A10.5.
		Zinc hexafluorosilicate, see ZINC CHLORIDE SOLUTION					
		Zinc muriate solution, see ZINC CHLORIDE, SOLUTION					
	UN1514	ZINC NITRATE	5.1		II	P5	A9.6.
	UN1515	ZINC PERMANGANATE	5.1		II	P5	A9.6.
	UN1516	ZINC PEROXIDE	5.1		II	P5	A9.6.
	UN1714	ZINC PHOSPHIDE	4.3	6.1	I	P3, A19, N40	A8.3.
	UN1436	ZINC POWDER or ZINC DUST	4.3	4.2 4.2 4.2	I II III	P3, A19, N40 P4, A19 P5	A8.3. A8.3. A8.3.
	UN2714	ZINC RESINATE	4.1		III	P5, A1	A8.3.
		Zinc selenates, see SELENATES *or* SELENITES					
		Zinc selenite, see SELENATES *or* SELENITES					

Table A4.1		*PROPER SHIPPING NAME/ DESCRIPTION*	*HAZARD CLASS/ DIV*	*SUBSIDIARY RISK*	*PG*	*SPECIAL PROVISION*	*PACKAGING PARAGRAPH*
(1)	*UN/ID NUMBER (2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
		Zinc silicofluoride, see ZINC FLUOROSILICATE					
	UN2858	ZIRCONIUM, DRY, *coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns)*	4.1		III	P5, A1	A8.3.
	UN2009	ZIRCONIUM, DRY, *finished sheets, strip, or coiled wire*	4.2		III	P5, A1, A19	A8.3.
	UN1437	ZIRCONIUM HYDRIDE	4.1		II	P5, A19, A20, N34	A8.3.
	UN2728	ZIRCONIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
	UN0236	ZIRCONIUM PICRAMATE, *dry or wetted with less than 20% water, by mass*	1.3C			P4	A5.9.
	UN1517	ZIRCONIUM PICRAMATE, WETTED *with not less than 20% water, by mass*	4.1		I	P4, 23, N41	A8.3.
	UN2008	ZIRCONIUM POWDER, DRY	4.2		I II III	P3 P5, A19, A20, N5, N34 P5	A8.3. A8.3. A8.3.
	UN1358	ZIRCONIUM POWDER, WETTED, *with not less than 25% water (a visible excess of water must be present (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns)*	4.1		II	P5, A19, A20, N34	A8.3.
		Zirconium powder, wetted with not less than 25% water (a visible excess of water must be present (a) mechanically produced, particle size more than 53 microns; (b) chemically produced, particle size more than 840 microns)					FORBIDDEN
	UN1932	ZIRCONIUM SCRAP	4.2		III	P5, N34	A8.3.
	UN1308	ZIRCONIUM SUSPENDED IN A LIQUID	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
	UN2503	ZIRCONIUM TETRACHLORIDE	8		III	P5	A12.3.

Table A4.2. Special Provisions.

When column 7 of Table A4.1. refers to a special provision for a hazardous material, the meaning and requirements of that provision are defined in this Table. The following list identifies the requirements of the special provisions referred to in column 7 of Table A4.1.:
Passenger Eligibility "P" Codes. These provisions apply to passenger movement with hazardous materials (see also Attachment 22).
P1 Transport this material on dedicated airlift (e.g. Special Assignment Airlift Mission) aircraft as identified in Attachment 24. Material authorized on cargo aircraft only. Passenger deviations are not authorized.
P2 Transport this material on cargo aircraft only. Passenger deviations are not authorized.
P3 Transport this material on cargo aircraft only. Deviations are authorized according to paragraph 2.2. and Attachment 22.
P4 Transport this material on cargo aircraft only. Deviations are authorized according to paragraph 2.2. and Attachment 22. DOD duty passengers do not require a deviation.
P5 Transport this material on passenger or cargo aircraft without passenger restriction.
Numeric Special Provisions.

1 This material is poisonous by inhalation in Hazard Zone A, describe as an inhalation hazard.
2 This material is poisonous by inhalation in Hazard Zone B, describe as an inhalation hazard.
3 This material is poisonous by inhalation in Hazard Zone C, describe as an inhalation hazard.
4 This material is poisonous by inhalation in Hazard Zone D, describe as an inhalation hazard.
5 If this material meets the defining criteria for a material poisonous by inhalation (49 CFR §173.116(a) or §173.133(a)) use an appropriate Class 2.3 or Class 6.1 generic PSN that identifies the inhalation hazard.
6 This material is poisonous by inhalation and must be described as an inhalation hazard.
7 An ammonia nitrate fertilizer is a fertilizer formulation, containing 90 percent or more ammonium nitrate and no more than 0.2 percent organic combustible material which does not meet the definition and criteria of a Class 1 material.
8 A hazardous substance that is not a hazardous waste may be shipped under the shipping description "Other regulated substance, liquid or solid", as appropriate.
9 EPA in 40 CFR §761.60 and §761.65 prescribes packaging for certain PCBs for disposal and storage.
11 Package material either as a liquid or solid, as appropriate, depending on its physical form at 55 degrees C (131 degrees F) at atmospheric pressure.
12 In concentrations greater than 40 percent, this material has strong oxidizing properties and is capable of starting fires in contact with combustible materials. If applicable, a package containing this material must comply with the subsidiary risk labeling requirements of Attachment 15.
13 The words “Inhalation Hazard” shall be entered on each shipping paper in association with the shipping description.
14 Motor fuel anti-knock mixtures are mixtures of one or more organic lead mixtures (such as tetraethyl lead, triethylmethyl lead, diethyldimethyl lead, ethyltrimethyl lead, and tetramethyl lead) with one or more halogen compounds (such as ethylene dibromide and ethylene dichloride), hydrocarbon solvents or other equally efficient stabilizers; or tetraethyl lead.
17 Aqueous solutions of hydrogen peroxide containing less than 8 percent hydrogen peroxide are not subject to the requirements of this manual.
21 This material must be stabilized by appropriate means to prevent dangerous polymerization.
22 If the hazardous material is in dispersion in organic liquid, the organic liquid must have a flash point above 50 degrees C (122 degrees F).
23 Classify this material as Class 4.1 only if it is packed so that the percentage of diluent will not fall below that stated in the shipping description at any time during transport.
27 Sodium carbonate peroxyhydrate is considered nonhazardous.
30 Sulphur is not regulated if transported in a non-bulk packaging or if formed to a specific shape (e.g., prills, granules, pellets, pastilles, or flakes).
31 Materials that have undergone sufficient heat treatment to render them nonhazardous are not subject to the requirements of this manual.
33 Ammonium nitrites and mixtures of an inorganic nitrite with an ammonium salt are prohibited.
36 The maximum net quantity per package is 5 L (1 gallon) or 5 kg (11 lbs.).

43 The nitrogen content of the nitrocellulose must not exceed 11.5 percent. Pack each single filter sheet between sheets of glazed paper. Ensure the portion of glazed paper between the filter sheets is not less than 65 percent, by mass. The membrane filters/paper arrangement must not be liable to propagate a detonation.
44 The formulation must be prepared so that it remains homogenous and does not separate during transport. Formulations with low nitrocellulose contents and neither showing dangerous properties when tested for their ability to detonate, deflagrate or explode when heated under defined confinement by the appropriate test methods and criteria in the UN Manual of Tests and Criteria, nor classed as a Division 4.1 (flammable solid) when tested in accordance with the procedures specified in 49 CFR §173.124 (chips, if necessary, crushed and sieved to a particle size of less than 1.25 mm), are not subject to the requirements of this manual.
46 During transport, it must be protected from direct sunshine and stored (or kept) in a cool and well-ventilated place, away from all sources of heat.
47 Mixtures of solids which are not subject to this subchapter and flammable liquids may be transported under this entry without first applying the classification criteria of Division 4.1, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level. Small inner packagings consisting of sealed packets containing less than 10 mL of a Class 3 liquid in Packing Group II or III absorbed onto a solid material are not subject to this subchapter provided there is no free liquid in the packet.
48 Mixtures of solids which are not subject to this subchapter and toxic liquids may be transported under this entry without first applying the classification criteria of Division 6.1, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level. This entry may not be used for solids containing a Packing Group I liquid.
49 Mixtures of solids which are not subject to this subchapter and corrosive liquids may be transported under this entry without first applying the classification criteria of Class 8, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level.
51 This description applies to items previously described as “Toy propellant devices, Class C” and includes reloaded kits. Model rocket motors containing 30 grams or less propellant are classed as Division 1.4S and items containing more than 30 grams of propellant but not more than 62.5 grams of propellant are classed as Division 1.4C.
53 Packages of these materials must bear a subsidiary risk label, "EXPLOSIVE", unless exempted by the DOT. A copy of the permit must accompany the shipment.
56 Ensure a means to interrupt and prevent detonation of the detonator from initiating the detonating cord is installed between each electric detonator and the detonating cord ends of the jet perforating guns.
60 An oxygen generator, chemical, that is shipped with its means of initiation attached must incorporate at least two positive means of preventing unintentional actuation of the generator, and be classed and approved by the Associate Administrator for Hazardous Materials Safety.
62 Oxygen generators are not authorized for transportation under this entry.

102 This article may be transported as Class 1.4D if all of the conditions specified in 49 CFR §173.63(a) are met. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.
103 Detonators that will not mass detonate and undergo only limited propagation in the shipping package may be assigned to Class 1.4B. Mass detonate means that more than 90 percent of the devices tested in a package explode practically simultaneously. Limited propagation means that if one detonator near the center of a shipping package is exploded, the aggregate weight of explosives, excluding ignition and delay charges, in this and all additional detonators in the outer packaging that explode, may not exceed 25 g. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.
104 Detonators which meet the following conditions may be assigned to Class 1.4S: Each detonator may contain no more than 1 g of explosive, excluding ignition and delay charges, and if one detonator near the center of the package detonates it will not cause functioning of any other device in the same or adjacent packages. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.
105 The word "Agents" may be used instead of "Explosives" when approved by the DOT.
106 The recognized name of the particular explosive may be specified in addition to the type.
107 The classification of the substance is expected to vary especially with the particle size and packaging, but the border lines have not been experimentally determined; verify appropriate classifications following the test procedures in 49 CFR §173.57 and §173.58. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.
108 Fireworks must be constructed and packaged so that loose pyrotechnic composition is not present in packages during transportation.
109 Rocket motors must be nonpropulsive in transportation unless approved according to A3.3.1.4. To be considered "nonpropulsive", a rocket motor must be capable of unrestrained burning and must not appreciably move in any direction when ignited by any means.
110 Fire extinguishers transported under UN1044 and oxygen cylinders transported for emergency use under UN1072 may include installed actuating cartridges (cartridges, power device of Division 1.4C or 1.4S), without changing the classification of Division 2.2 unless listed as a Class 1 material in the JHCS, provided the aggregate quantity of deflagrating (propellant) explosives does not exceed 3.2 grams per cylinder. Oxygen cylinders with installed actuating cartridges as prepared for transportation must have an effective means of preventing inadvertent activation. Reclassification as a non-explosive requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.
111 Explosive substances of Class 1.1A are forbidden for transportation if dry or not desensitized, unless incorporated in a device.
112 Cartridges, Small Arms (1.4S) and Cartridges, Power Devices (used to project fastening devices) (1.4S) classified by the manufacturer as ORM-D-Air may only be shipped to domestic locations. The ORM-D-Air designation may only be used until 31 December 2012. These items may be offered for transportation and transported as limited quantities when authorized and transported in accordance with 49 CFR §173.63. Ammunition shipped internationally must be classified as explosives (Class 1) and packaged according to Attachment 5. For Class 1 material listed in the JHCS, reclassification requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.

113 The sample must be given a tentative approval by an agency or laboratory according to the provisions of 49 CFR §173.56.
115 Boosters with detonator (detonating primers) in which the total explosive charge per unit does not exceed 25 g, and which will not mass detonate and undergo only limited propagation in the shipping package may be assigned to Class 1.4B. Mass detonate means more than 90 percent of the devices tested in a package explode practically simultaneously. Limited propagation means that if one booster near the center of the package is exploded, the aggregate weight of explosives, excluding ignition and delay charges, in this and all additional boosters in the outer packaging that explode may not exceed 25 g. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.
116 Fuzes, detonating, may be classed in Class 1.4 if the fuzes do not contain more than 25 g of explosive per fuze and are made and packaged so that they will not cause functioning of other fuzes, explosives, or other explosive devices if one of the fuzes detonates in a shipping packaging or in adjacent packages. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.
117 If a shipment of the explosive substance is to take place at a time that freezing weather is anticipated, the water contained in the explosive substance must be mixed with denatured alcohol so that freezing will not occur.
118 This substance may not be transported under the provisions of Division 4.1 unless specifically authorized by the Associate Administrator.
123 Any explosive, blasting, type C containing chlorate must be segregated from explosives containing ammonium nitrate or other ammonium salts.
127 Mixtures containing oxidizing and organic materials transported under this entry may not meet the definition and criteria of a Class 1 material.
134 This entry applies to vehicles, machinery and equipment that are powered by wet batteries, sodium batteries, or lithium batteries and which are transported with these batteries installed.
135 Change PSN to “Vehicle, flammable gas powered” or “Vehicle, flammable liquid powered”, as appropriate, when internal combustion engines are installed in a vehicle. These entries include hybrid electric vehicles powered by both an internal combustion engine and wet, sodium or lithium batteries installed. If a fuel cell engine is installed in a vehicle, the vehicle must be consigned using the entries‘‘Vehicle, fuel cell, flammable gas powered’’ or ‘‘Vehicle, fuel cell, flammable liquid powered,’’ as appropriate. These entries include hybrid electric vehicles powered by a fuel cell, an internal combustion engine, and wet, sodium or lithium batteries installed.
139 Use of the "special arrangement" proper shipping names for international shipments must be made under an IAEA Certificate of Competent Authority issued by the Associate Administrator in accordance with the requirements in 49 CFR §173.471, §173.472, or §173.473. Use of these proper shipping names for domestic shipments may be made only under a DOT special permit.
162 This material may be transported under the provisions of Division 4.1 only if it is packed so that at no time during transport will the percentage of diluent fall below the percentage that is stated in the shipping description.

165 These substances are susceptible to exothermic decomposition at elevated temperatures. Decomposition can be initiated by heat, moisture or by impurities (e.g., powdered metals (iron, manganese, cobalt, magnesium)). During the course of transportation, these substances must be shaded from direct sunlight and all sources of heat and be placed in adequately ventilated areas.
167 These storage systems must always be considered as containing hydrogen. A metal hydride storage system installed in or intended to be installed in a vehicle or equipment or in vehicle or equipment components must be approved for transport by the Associate Administrator. A copy of the approval must accompany each shipment.
177 Gasoline, or, ethanol and gasoline mixtures, for use in internal combustion engines (*e.g.* , in automobiles, stationary engines and other engines) must be assigned to Packing Group II regardless of variations in volatility.
198 Nitrocellulose solutions containing not more than 20% nitrocellulose may be transported as paint or printing ink, perfumery products, as applicable, provided the nitrocellulose contains no more 12.6% nitrogen (by dry mass). See UN1210, UN1263, UN3066, UN3469, and UN3470.
332 “Magnesium nitrate hexahydrate” is not subject to the requirements of this manual.
346 “Nitrogen, refrigerated liquid (*cryogenic liquid*), UN1977” transported in accordance with the requirements for open cryogenic receptacles in 49 CFR §173.320 and this special provision are not subject to any other requirements of this manual. The receptacle must contain no hazardous materials other than the liquid nitrogen which must be fully absorbed in a porous material in the receptacle.
347 Substances and articles assigned to these PSNs must pass Test series 6(d) of Part I of the UN Manual of Tests and Criteria, be shipped under an appropriate CAA/DOT-SP, or must be reclassified as other than 1.4S. This Special Provision becomes effective for military air shipments on 1 January 2014. Be advised that this Special Provision is already in effect for commercial air shipments.
"A” Provisions. These special provisions are in addition to other requirements for military air shipment.
A1 Single packaging is not permitted on aircraft carrying passengers. P4 restrictions apply.
A2 Single packagings are not permitted.
A3 For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packagings.
A4 Liquids having an inhalation toxicity of PG I and are identified as P1, P2, or P3 are not permitted on passenger aircraft. Deviations are not allowed.
A5 Solids having an inhalation toxicity of PG I and are identified as P1, P2, or P3, are not permitted on passenger aircraft and may not exceed a maximum net quantity per package of 15 kg (33 pounds) on cargo aircraft. See paragraph 2.2. for deviation authority.
A6 For combination packagings, if plastic inner packagings are used, pack in tightly closed metal receptacles before packing into outer packagings.
A7 Steel packagings must be corrosion-resistant or have protection against corrosion.
A8 For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with cushioning material in tightly closed metal receptacles before packing in outer packagings.

A9 For combination packages, if plastic bags are used, they must be packed in tightly closed metal receptacles before packing in outer packagings.
A10 When aluminum or aluminum alloy construction materials are used, they must be resistant to corrosion.
A11 For combination packagings, when metal inner packagings are permitted, only specification cylinders constructed of metals which are compatible with the hazardous material may be used.
A19 Combination packagings consisting of outer fiber drums or plywood drums, with inner plastic packagings, are not authorized.
A20 Plastic bags as inner receptacles of combination packagings are not authorized.
A29 Combination packagings consisting of outer expanded plastic boxes with inner plastic bags are not authorized.
A30 Ammonium permanganate is not authorized.
A33 Ammonium nitrates and mixtures of an inorganic nitrite with an ammonium salt are prohibited.
A35 This includes material which is not covered by any other hazard class but has anesthetic, narcotic, noxious or other properties such that, in the event of spillage or leakage on the aircraft, extreme annoyance or discomfort could be caused to aircrew members so as to prevent correct performance of assigned duties. For material containing aromatic extract or flavoring, use packaging paragraph A13.2. For all other material shipped under this PSN, use packaging paragraph A13.14.
A37 This entry applies only to a material meeting the definition in 49 CFR §171.8 for self-defense spray.
A43 Toxins from plant, animal or bacterial sources, which contain infectious substances, or toxins that are contained in infectious substances, must be classified as Division 6.2.
A56 Radioactive material with a subsidiary hazard of Division 4.2 Packing Group I must be transported in Type B packages when offered for transportation by aircraft. Radioactive material with a subsidiary hazard of Division 2.1 is forbidden from transport on passenger aircraft.
A58 An aqueous solution containing 24% or less alcohol by volume and more than 50% water is not subject to these regulations.
A67 Non-spillable batteries are considered dry batteries and not subject to any other requirements of this manual if: (1) At a temperature of 55 degrees C (130 degrees F), the electrolyte will not flow from a ruptured or cracked case and there is no free liquid to flow. (2) Packaged for transport in inner packagings or installed in equipment that effectively prevents activation or short circuit and prevents movement that could lead to short circuit.
A69 May be transported using a DOT hazard classification approval. Except for Class/Division 1.4S, a copy of the approval must accompany the shipment. See A3.3.1.4.
A117 Wastes transported under UN3291 are wastes derived from the medical treatment of humans or animals or from bio-research, where there is a relatively low probability that infectious substances are present. Waste infectious substances which can be specified must be assigned to UN2814 or UN2900. Decontaminated wastes which previously contained infectious substances may be considered as not subject to these regulations unless the criteria of another Class or Division are met.

A124 Only mixtures with not more than 23.5% oxygen may be transported under this entry. A Division 5.1 subsidiary risk label is not required for any concentration within this limit.
A140 Technical name must not be shown on the package, but must be shown on the shipper's declaration for danferous goods. When the infectious substances to be transported are unknown, but suspected of meeting the criteria for inclusion in Category A and assigned to UN2814 or UN2900, the words "Suspected Category A Infectious Substance" must be shown in parenthesis following the proper shipping name on the shipper's declaration for dangerous goods but not on the outer package.
A500 P2 Code applies if rocket motor contains hypergolic liquids.
A501 P3 does not apply to unit maintenance and support personnel traveling on Special Assignment Airlift Missions.
A502 With approval of Shipper's HAZMAT service focal point (see paragraph 1.2.2.), may be shipped as P2.
A503 Only Class 2 (non-toxic aerosols only), Class 3 (Packing Group II or III only) and Division 6.1 (Packing Group III only) provided such substances do not have a subsidiary risk may be shipped to an international (non-domestic) location as a Class 9.
A504 ORM-D designation may only be used for domestic shipments. Substances may also be classified as a Class 9 for domestic shipment. Comply with Special Provision A503 for international shipments. The ORM-D designation may only be used until 31 December 2012.
A506 Inner receptacles of a combination package and a single package must be capable of meeting the internal air gauge pressure requirements for a PG III liquid.
A507 Determine passenger eligibility ("P" Coded special provisions) for radioactive materials as follows: (1) Radioactive materials requiring a Category III-Yellow label will be transported under the provisions of P3. Deviations not authorized unless radioactive material intended for use in, or incident to, research, medical diagnosis, or treatment. Also see A22.1.7.2. (2) Radioactive materials requiring a Category II-Yellow label will be transported under the provisions of P4. Deviations not authorized unless radioactive material intended for use in, or incident to, research, medical diagnosis, or treatment, and the total TI of all of the packages is 50 TI or less. Also see A22.1.7.2. (3) Radioactive materials requiring a Category I-White or no label will be transported under the provisions of P5. Also see A3.3.7.5.4.
A508 Diagnostic, Patient, or Clinical Specimens not containing a Category A or B infectious substances are not regulated by this manual.
A509 Magnesium alloys with 50% or less magnesium in pellets, turning or ribbons are not regulated.
A510 Emergency power units (EPU) for F-16 aircraft will be packaged, marked and labeled IAW a DOT-SP, CAA or COE.
A511 Packages of lithium ion batteries not exceeding 5kg (11 pounds) each may be shipped under Special Provision P5.
"N" Provisions.
N3 Glass inner packagings are permitted in combination or composite packagings only if the hazardous material is free from hydrofluoric acid.

N4 For combination or composite packagings, glass inner packagings, other than ampoules, are not permitted.
N5 Glass materials of construction are not authorized for any part of the packaging which is normally in contact with the hazardous material.
N6 Battery fluid packaged with electric storage batteries, wet or dry, must conform to the packaging provisions of A12.4.4.
N7 The hazard class or division number of the material must be marked on the package according to 49 CFR §172.302. However, the hazard label corresponding to the hazard class or division may be substituted for the marking.
N8 Nitroglycerin solution in alcohol may be transported under this entry only when the solution is packed in metal cans of not more than 1 L capacity each, overpacked in a wooden box containing not more than 5 L. Completely surround metal cans with absorbent cushioning material. Completely line wooden boxes with a suitable material impervious to water and nitroglycerin.
N12 Plastic packagings are not authorized.
N25 Steel single packagings are not authorized.
N32 Aluminum materials of construction are not authorized for single packagings.
N33 Aluminum drums are not authorized.
N34 Aluminum construction materials are not authorized for any part of a packaging which is normally in contact with the hazardous materials.
N36 Aluminum or aluminum alloy construction materials are permitted only for halogenated hydrocarbons that will not react with aluminum.
N37 This material may be shipped in an integrally-lined fiber drum (1G) which meets the general packaging requirements of Attachment 3, the UN performance tests required based on the PG assigned to the material and to any other special provisions of column 7 of Table A4.1.
N40 This material is not authorized in the following packagings: (1) A combination packaging consisting of a 4G fiberboard box with inner receptacles of glass or earthenware. (2) A single packaging of a 4C2 sift-proof, natural wood box. (3) A composite packaging 6PG2 (glass, porcelain, or stoneware receptacles within a fiberboard box).
N41 Metal construction materials are not authorized for any part of a packaging that is normally in contact with the hazardous material.
N43 Metal drums are permitted as single packagings only if constructed of nickel or Monel.
N45 For combination packagings, copper cartridges are permitted as inner packagings when the hazardous material is not in dispersion.
N65 Outage must be sufficient to prevent cylinders or spheres from becoming liquid full at 55 degrees C (130 degrees F). The vacant space (outage) may be charged with a nonflammable, nonliquefied compressed gas if the pressure in the cylinder or sphere at 55 degrees C (130 degrees F) does not exceed 125 percent of the marked service pressure.
N73 Packagings consisting of outer wooden or fiberboard boxes with inner glass, metal, or other strong containers; metal or fiber drums; kegs or barrels; or strong metal cans are authorized and need not conform to the UN test requirements for domestic shipment.

N74 Packages consisting of tightly closed inner containers of glass, earthenware, metal or polyethylene, capacity not over 0.5 kg (1.1 pounds) securely cushioned and packed in outer wooden barrels or wooden or fiberboard boxes, not over 15 kg (33 pounds) net weight, are authorized and need not conform to the UN test requirements for domestic shipment.
N75 Packages consisting of tightly closed inner packagings of glass, earthenware, or metal, securely cushioned and packed in outer wooden barrels, or wooden or fiberboard boxes, capacity not over 2.5 kg (5.5 pounds) net weight, are authorized and need not conform to the UN test requirements for domestic shipment.
N76 For materials of not more than 25 percent active ingredient by weight, packages consisting of inner metal packagings not greater than 250 ml (8 ounces) capacity each, packed in strong outer packagings together with sufficient absorbent material to completely absorb the liquid contents are authorized and need not conform to the UN test requirements for domestic shipment.
N77 For materials of not more than two percent active ingredients by weight and the liquid contents are absorbed in an inert material, the packagings need not conform to the UN test requirements for domestic shipment.
N78 Packages consisting of inner glass, earthenware, polyethylene, or other nonfragile plastic bottles or jars not over 0.5 kg (1.1 pounds) capacity each, or metal cans not over 5 pounds capacity each, packed in outer wooden boxes, barrels, kegs, or fiberboard boxes, are authorized and need not conform to the UN test requirements for domestic shipments. Net weight of contents in fiberboard boxes may not exceed 29 kg (64 pounds). Net weight of contents in wooden boxes, barrels, or kegs may not exceed 45 kg (99 pounds).
N79 Packages consisting of tightly closed metal inner packagings not over 0.5 kg (1.1 pounds) capacity each, packed in outer wooden or fiberboard boxes, or wooden barrels, are authorized and need not conform to UN test requirements for domestic shipment. Net weight of contents may not exceed 15 kg (33 pounds).
N85 Packagings certified at the Packing Group I performance level may not be used.
N86 UN pressure receptacles made of aluminum alloy are not authorized.
N87 The use of copper valves on UN pressure receptacles is prohibited.
N88 Any metal part of a UN pressure receptacle in contact with the contents may not contain more than 65% copper, with a tolerance of 1%.
N89 When steel UN pressure receptacles are used, only those bearing the “H” mark are authorized.
N90 Metal packagings are not authorized.

Table A4.3. Hazardous Substance and Reportable Quantities.

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
A2213	5000 (2270)
Acenaphthene	100 (45.4)
Acenaphthylene	5000 (2270)
Acetaldehyde	1000 (454)
Acetaldehyde, chloro-	1000 (454)
Acetaldehyde, trichloro-	5000 (2270)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Acetamide	100 (45.4)
Acetamide, N-(aminothioxomethyl)-	1000 (454)
Acetamide, N-(4-ethoxyphenyl)-	100 (45.4)
Acetamide, N-9H-fluoren-2-yl-	1 (0.454)
Acetamide, 2-fluoro-	100 (45.4)
Acetic acid	5000 (2270)
Acetic acid, (2,4-dichlorophenoxy)-, salts & esters	100 (45.4)
Acetic acid, ethyl ester	5000 (2270)
Acetic acid, fluoro-, sodium salt	10 (4.54)
Acetic acid, lead(2+) salt	10 (4.54)
Acetic acid, thallium(1+) salt	100 (45.4)
Acetic acid, (2,4,5-trichlorophenoxy)-	1000 (454)
Acetic anhydride	5000 (2270)
Acetone	5000 (2270)
Acetone cyanohydrin	10 (4.54)
Acetonitrile	5000 (2270)
Acetophenone	5000 (2270)
2-Acetylaminofluorene	1 (0.454)
Acetyl bromide	5000 (2270)
Acetyl chloride	5000 (2270)
1-Acetyl-2-thiourea	1000 (454)
Acrolein	1 (0.454)
Acrylamide	5000 (2270)
Acrylic acid	5000 (2270)
Acrylonitrile	100 (45.4)
Adipic acid	5000 (2270)
Aldicarb	1 (0.454)
Aldicarb sulfone	100 (45.4)
Aldrin	1 (0.454)
Allyl alcohol	100 (45.4)
Allyl chloride	1000 (454)
Aluminum phosphide	100 (45.4)
Aluminum sulfate	5000 (2270)
4-Aminobiphenyl	1 (0.454)
5-(Aminomethyl)-3-isoxazolol	1000 (454)
4-Aminopyridine	1000 (454)
Amitrole	10 (4.54)
Ammonia	100 (45.4)
Ammonium acetate	5000 (2270)
Ammonium benzoate	5000 (2270)
Ammonium bicarbonate	5000 (2270)
Ammonium bichromate	10 (4.54)
Ammonium bifluoride	100 (45.4)
Ammonium bisulfite	5000 (2270)
Ammonium carbamate	5000 (2270)
Ammonium carbonate	5000 (2270)
Ammonium chloride	5000 (2270)
Ammonium chromate	10 (4.54)
Ammonium citrate, dibasic	5000 (2270)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Ammonium dichromate[@]	10 (4.54)
Ammonium fluoborate	5000 (2270)
Ammonium fluoride	100 (45.4)
Ammonium hydroxide	1000 (454)
Ammonium oxalate	5000 (2270)
Ammonium picrate	10 (4.54)
Ammonium silicofluoride	1000 (454)
Ammonium sulfamate	5000 (2270)
Ammonium sulfide	100 (45.4)
Ammonium sulfite	5000 (2270)
Ammonium tartrate	5000 (2270)
Ammonium thiocyanate	5000 (2270)
Ammonium vanadate	1000 (454)
Amyl acetate, iso-Amyl acetate, sec-Amyl acetate, tert-Amyl acetate	5000 (2270)
Aniline	5000 (2270)
o-Anisidine	100 (45.4)
Anthracene	5000 (2270)
Antimony[¢]	5000 (2270)
Antimony pentachloride	1000 (454)
Antimony potassium tartrate	100 (45.4)
Antimony tribromide	1000 (454)
Antimony trichloride	1000 (454)
Antimony trifluoride	1000 (454)
Antimony trioxide	1000 (454)
Argentate(1-), bis(cyano-C)-, potassium	1 (0.454)
Aroclor 1016	1 (0.454)
Aroclor 1221	1 (0.454)
Aroclor 1232	1 (0.454)
Aroclor 1242	1 (0.454)
Aroclor 1248	1 (0.454)
Aroclor 1254	1 (0.454)
Aroclor 1260	1 (0.454)
Aroclors	1 (0.454)
Arsenic[¢]	1 (0.454)
Arsenic acid H_3AsO_4	1 (0.454)
Arsenic disulfide	1 (0.454)
Arsenic oxide As_2O_3	1 (0.454)
Arsenic oxide As_2O_5	1 (0.454)
Arsenic pentoxide	1 (0.454)
Arsenic trichloride	1 (0.454)
Arsenic trioxide	1 (0.454)
Arsenic trisulfide	1 (0.454)
Arsine, diethyl-	1 (0.454)
Arsinic acid, dimethyl-	1 (0.454)
Arsonous dichloride, phenyl-	1 (0.454)
Asbestos[¢¢]	1 (0.454)
Auramine	100 (45.4)
Azaserine	1 (0.454)
Aziridine	1 (0.454)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Aziridine, 2-methyl-	1 (0.454)
Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha,8beta,8aalpha, 8balpha)]-	10 (4.54)
Barban	10 (4.54)
Barium cyanide	10 (4.54)
Bendiocarb	100 (45.4)
Bendiocarb phenol	1000 (454)
Benomyl	10 (4.54)
Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	10 (4.54)
Benz[c]acridine	100 (45.4)
Benzal chloride	5000 (2270)
Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	5000 (2270)
Benz[a]anthracene	10 (4.54)
1,2-Benzanthracene	10 (4.54)
Benz[a]anthracene, 7,12-dimethyl-	1 (0.454)
Benzenamine	5000 (2270)
Benzenamine, 4,4'-carbonimidoylbis (N,N dimethyl-	100 (45.4)
Benzenamine, 4-chloro-	1000 (454)
Benzenamine, 4-chloro-2-methyl-, hydrochloride	100 (45.4)
Benzenamine, N,N-dimethyl-4-(phenylazo)-	10 (4.54)
Benzenamine, 2-methyl-	100 (45.4)
Benzenamine, 4-methyl-	100 (45.4)
Benzenamine, 4,4'-methylenebis[2-chloro-	10 (4.54)
Benzenamine, 2-methyl-, hydrochloride	100 (45.4)
Benzenamine, 2-methyl-5-nitro-	100 (45.4)
Benzenamine, 4-nitro-	5000 (2270)
Benzene	10 (4.54)
Benzeneacetic acid, 4-chloro-α-(4-chlorophenyl)-α-hydroxy-, ethyl ester	10 (4.54)
Benzene, 1-bromo-4-phenoxy-	100 (45.4)
Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	10 (4.54)
Benzene, chloro-	100 (45.4)
Benzene, (chloromethyl)-	100 (45.4)
Benzenediamine, ar-methyl-	10 (4.54)
1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester	100 (45.4)
1,2-Benzenedicarboxylic acid, dibutyl ester	10 (4.54)
1,2-Benzenedicarboxylic acid, diethyl ester	1000 (454)
1,2-Benzenedicarboxylic acid, dimethyl ester	5000 (2270)
1,2-Benzenedicarboxylic acid, dioctyl ester	5000 (2270)
Benzene, 1,2-dichloro-	100 (45.4)
Benzene, 1,3-dichloro-	100 (45.4)
Benzene, 1,4-dichloro-	100 (45.4)
Benzene, 1,1'-(2,2-dichloroethylidene) bis[4-chloro-	1 (0.454)
Benzene, (dichloromethyl)-	5000 (2270)
Benzene, 1,3-diisocyanatomethyl-	100 (45.4)
Benzene, dimethyl-	100 (45.4)
1,3-Benzenediol	5000 (2270)
1,2-Benzenediol,4-[1-hydroxy-2-(methylamino) ethyl]-	1000 (454)
Benzeneethanamine, alpha,alpha-dimethyl-	5000 (2270)
Benzene, hexachloro-	10 (4.54)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Benzene, hexahydro-	1000 (454)
Benzene, methyl-	1000 (454)
Benzene, 1-methyl-2,4-dinitro-	10 (4.54)
Benzene, 2-methyl-1,3-dinitro-	100 (45.4)
Benzene, (1-methylethyl)-	5000 (2270)
Benzene, nitro-	1000 (454)
Benzene, pentachloro-	10 (4.54)
Benzene, pentachloronitro-	100 (45.4)
Benzenesulfonic acid chloride	100 (45.4)
Benzenesulfonyl chloride	100 (45.4)
Benzene,1,2,4,5-tetrachloro-	5000 (2270)
Benzenethiol	100 (45.4)
Benzene,1,1'-(2,2,2-trichloroethylidene) bis[4-chloro-	1 (0.454)
Benzene,1,1'-(2,2,2-trichloroethylidene) bis[4-methoxy-	1 (0.454)
Benzene, (trichloromethyl)-	10 (4.54)
Benzene, 1,3,5-trinitro-	10 (4.54)
Benzidine	1 (0.454)
Benzo[a]anthracene	10 (4.54)
1,3-Benzodioxole, 5-(1-propenyl)-1	100 (45.4)
1,3-Benzodioxole, 5-(2-propenyl)-	100 (45.4)
1,3-Benzodioxole, 5-propyl-	10 (4.54)
1,3-Benzodioxol-4-ol, 2,2-dimethyl-	1000 (454)
1,3-Benzodioxol-4-ol, 2,2-dimethyl-, methyl carbamate	100 (45.4)
Benzo[b]fluoranthene	1 (0.454)
Benzo(k)fluoranthene	5000 (2270)
7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-	10 (4.54)
7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate	10 (4.54)
Benzoic acid	5000 (2270)
Benzoic acid, 2-hydroxy-, compd. with (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethylpyrrolo [2,3-b]indol-5-yl methylcarbamate ester (1:1)	100 (45.4)
Benzonitrile	5000 (2270)
Benzo[rst]pentaphene	10 (4.54)
Benzo[ghi]perylene	5000 (2270)
2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts	100 (45.4)
Benzo[a]pyrene	1 (0.454)
3,4-Benzopyrene	1 (0.454)
p-Benzoquinone	10 (4.54)
Benzotrichloride	10 (4.54)
Benzoyl chloride	1000 (454)
Benzyl chloride	100 (45.4)
Beryllium[¢]	10 (4.54)
Beryllium chloride	1 (0.454)
Beryllium fluoride	1 (0.454)
Beryllium nitrate	1 (0.454)
Beryllium powder[¢]	10 (4.54)
alpha-BHC	10 (4.54)
beta-BHC	1 (0.454)
delta-BHC	1 (0.454)
gamma-BHC	1 (0.454)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
2,2'-Bioxirane	10 (4.54)
Biphenyl	100 (45.4)
[1,1'-Biphenyl]-4,4'-diamine	1 (0.454)
[1,1'-Biphenyl]-4,4'-diamine,3,3'-dichloro-	1 (0.454)
[1,1'-Biphenyl]-4,4'-diamine,3,3'-dimethoxy-	100 (45.4)
[1,1'-Biphenyl]-4,4'-diamine,3,3'-dimethyl-	10 (4.54)
Bis(2-chloroethoxy) methane	1000 (454)
Bis(2-chloroethyl) ether	10 (4.54)
Bis(chloromethyl) ether	10 (4.54)
Bis(2-ethylhexyl) phthalate	100 (45.4)
Bromoacetone	1000 (454)
Bromoform	100 (45.4)
Bromomethane	1000 (454)
4-Bromophenyl phenyl ether	100 (45.4)
Brucine	100 (45.4)
1,3-Butadiene	10 (4.54)
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	1 (0.454)
1-Butanamine, N-butyl-N-nitroso-	10 (4.54)
1-Butanol	5000 (2270)
2-Butanone	5000 (2270)
2-Butanone, 3,3-dimethyl-1(methylthio)-, O [(methylamino) carbonyl] oxime	100 (45.4)
2-Butanone peroxide	10 (4.54)
2-Butenal	100 (45.4)
2-Butene, 1,4-dichloro-	1 (0.454)
2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy] methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z), 7(2S*,3R*),7aalpha]]-	10 (4.54)
Butyl acetate, iso-Butyl acetate, sec-Butyl acetate, tert-Butyl acetate	5000 (2270)
n-Butyl alcohol	5000 (2270)
Butylamine, iso-Butylamine, sec-Butylamine, tert-Butylamine	1000 (454)
Butyl benzyl phthalate	100 (45.4)
n-Butyl phthalate	10 (4.54)
Butyric acid, iso-Butyric acid	5000 (2270)
Cacodylic acid	1 (0.454)
Cadmium[¢]	10 (4.54)
Cadmium acetate	10 (4.54)
Cadmium bromide	10 (4.54)
Cadmium chloride	10 (4.54)
Calcium arsenate	1 (0.454)
Calcium arsenite	1 (0.454)
Calcium carbide	10 (4.54)
Calcium chromate	10 (4.54)
Calcium cyanamide	1000 (454)
Calcium cyanide $Ca(CN)_2$	10 (4.54)
Calcium dodecylbenzenesulfonate	1000 (454)
Calcium hypochlorite	10 (4.54)
Captan	10 (4.54)
Carbamic acid, 1H-benzimidazol-2-yl, methyl ester	10 (4.54)
Carbamic acid, [1-[(butylamino)carbonyl]-1H-benzimidazol-2-yl]-, methyl ester	10 (4.54)
Carbamic acid, (3-chlorophenyl)-, 4-chloro-2-butynyl ester	10 (4.54)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Carbamic acid, [(dibutylamino)-thio]methyl-, 2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester	1000 (454)
Carbamic acid, dimethyl-,1-[(dimethyl-amino)carbonyl]-5-methyl-1H-pyrazol-3-yl ester	1 (0.454)
Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester	100 (45.4)
Carbamic acid, ethyl ester	100 (45.4)
Carbamic acid, methyl-, 3-methylphenyl ester	1000 (454)
Carbamic acid, methylnitroso-, ethyl ester	1 (0.454)
Carbamic acid, [1,2-phenylenebis(iminocarbonothioyl)] bis-, dimethyl ester	10 (4.54)
Carbamic acid, phenyl-, 1-methylethyl ester	1000 (454)
Carbamic chloride, dimethyl-	1 (0.454)
Carbamodithioic acid, 1,2-ethanediylbis-, salts & esters	5000 (2270)
Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester	100 (45.4)
Carbamothioic acid, bis(1-methylethyl)-, S-(2,3,3-trichloro-2-propenyl) ester	100 (45.4)
Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester	5000 (2270)
Carbaryl	100 (45.4)
Carbendazim	10 (4.54)
Carbofuran	10 (4.54)
Carbofuran phenol	10 (4.54)
Carbon disulfide	100 (45.4)
Carbonic acid, dithallium(1+) salt	100 (45.4)
Carbonic dichloride	10 (4.54)
Carbonic difluoride	1000 (454)
Carbonochloridic acid, methyl ester	1000 (454)
Carbon oxyfluoride	1000 (454)
Carbon tetrachloride	10 (4.54)
Carbonyl sulfide	100 (45.4)
Carbosulfan	1000 (454)
Catechol	100 (45.4)
Chloral	5000 (2270)
Chloramben	100 (45.4)
Chlorambucil	10 (4.54)
Chlordane	1 (0.454)
Chlordane, alpha & gamma isomers	1 (0.454)
Chlordane (technical mixture and metabolites)	1 (0.454)
Chlorinated camphene	1 (0.454)
Chlorine	10 (4.54)
Chlornaphazine	100 (45.4)
Chloroacetaldehyde	1000 (454)
Chloroacetic acid	100 (45.4)
2-Chloroacetophenone	100 (45.4)
p-Chloroaniline	1000 (454)
Chlorobenzene	100 (45.4)
Chlorobenzilate	10 (4.54)
p-Chloro-m-cresol	5000 (2270)
Chlorodibromomethane	100 (45.4)
1-Chloro-2,3-epoxypropane	100 (45.4)
Chloroethane	100 (45.4)
2-Chloroethyl vinyl ether	1000 (454)
Chloroform	10 (4.54)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Chloromethane	100 (45.4)
Chloromethyl methyl ether	10 (4.54)
beta-Chloronaphthalene	5000 (2270)
2-Chloronaphthalene	5000 (2270)
2-Chlorophenol	100 (45.4)
o-Chlorophenol	100 (45.4)
4-Chlorophenyl phenyl ether	5000 (2270)
1-(o-Chlorophenyl)thiourea	100 (45.4)
Chloroprene	100 (45.4)
3-Chloropropionitrile	1000 (454)
Chlorosulfonic acid	1000 (454)
4-Chloro-o-toluidine, hydrochloride	100 (45.4)
Chlorpyrifos	1 (0.454)
Chromic acetate	1000 (454)
Chromic acid	10 (4.54)
Chromic acid H_2CrO_4, calcium salt	10 (4.54)
Chromic sulfate	1000 (454)
Chromium[¢]	5000 (2270)
Chromous chloride	1000 (454)
Chrysene	100 (45.4)
Cobaltous bromide	1000 (454)
Cobaltous formate	1000 (454)
Cobaltous sulfamate	1000 (454)
Coke Oven Emissions	1 (0.454)
Copper[¢]	5000 (2270)
Copper chloride[@]	10 (4.54)
Copper cyanide Cu(CN)	10 (4.54)
Coumaphos	10 (4.54)
Creosote	1 (0.454)
Cresol (cresylic acid)	100 (45.4)
m-Cresol	100 (45.4)
o-Cresol	100 (45.4)
p-Cresol	100 (45.4)
Cresols (isomers and mixture)	100 (45.4)
Cresylic acid (isomers and mixture)	100 (45.4)
Crotonaldehyde	100 (45.4)
Cumene	5000 (2270)
m-Cumenyl methylcarbamate	10 (4.54)
Cupric acetate	100 (45.4)
Cupric acetoarsenite	1 (0.454)
Cupric chloride	10 (4.54)
Cupric nitrate	100 (45.4)
Cupric oxalate	100 (45.4)
Cupric sulfate	10 (4.54)
Cupric sulfate, ammoniated	100 (45.4)
Cupric tartrate	100 (45.4)
Cyanides (soluble salts and complexes) not otherwise specified	10 (4.54)
Cyanogen	100 (45.4)
Cyanogen bromide (CN)Br	1000 (454)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Cyanogen chloride (CN)Cl	10 (4.54)
2,5-Cyclohexadiene-1,4-dione	10 (4.54)
Cyclohexane	1000 (454)
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α, 2α, 3β-, 4α, 5α, 6β)	1 (0.454)
Cyclohexanone	5000 (2270)
2-Cyclohexyl-4,6-dinitrophenol	100 (45.4)
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	10 (4.54)
Cyclophosphamide	10 (4.54)
2,4-D Acid	100 (45.4)
2,4-D Ester	100 (45.4)
2,4-D, salts and esters	100 (45.4)
Daunomycin	10 (4.54)
DDD	1 (0.454)
4,4'-DDD	1 (0.454)
DDE (72-55-9)[#]	1 (0.454)
DDE (3547-04-4)[#]	5000 (2270)
4,4'-DDE	1 (0.454)
DDT	1 (0.454)
4,4'-DDT	1 (0.454)
DEHP	100 (45.4)
Diallate	100 (45.4)
Diazinon	1 (0.454)
Diazomethane	100 (45.4)
Dibenz[a,h]anthracene	1 (0.454)
1,2:5,6-Dibenzanthracene	1 (0.454)
Dibenzo[a,h]anthracene	1 (0.454)
Dibenzofuran	100 (45.4)
Dibenzo[a,i]pyrene	10 (4.54)
1,2-Dibromo-3-chloropropane	1 (0.454)
Dibromoethane	1 (0.454)
Dibutyl phthalate	10 (4.54)
Di-n-butyl phthalate	10 (4.54)
Dicamba	1000 (454)
Dichlobenil	100 (45.4)
Dichlone	1 (0.454)
Dichlorobenzene	100 (45.4)
1,2-Dichlorobenzene	100 (45.4)
1,3-Dichlorobenzene	100 (45.4)
1,4-Dichlorobenzene	100 (45.4)
m-Dichlorobenzene	100 (45.4)
o-Dichlorobenzene	100 (45.4)
p-Dichlorobenzene	100 (45.4)
3,3'-Dichlorobenzidine	1 (0.454)
Dichlorobromomethane	5000 (2270)
1,4-Dichloro-2-butene	1 (0.454)
Dichlorodifluoromethane	5000 (2270)
1,1-Dichloroethane	1000 (454)
1,2-Dichloroethane	100 (45.4)
1,1-Dichloroethylene	100 (45.4)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
1,2-Dichloroethylene	1000 (454)
Dichloroethyl ether	10 (4.54)
Dichloroisopropyl ether	1000 (454)
Dichloromethane	1000 (454)
Dichloromethoxyethane	1000 (454)
Dichloromethyl ether	10 (4.54)
2,4-Dichlorophenol	100 (45.4)
2,6-Dichlorophenol	100 (45.4)
Dichlorophenylarsine	1 (0.454)
Dichloropropane; 1,1-Dichloropropane; 1,3-Dichloropropane	1000 (454)
1,2-Dichloropropane	1000 (454)
Dichloropropane-Dichloropropene (mixture)	100 (45.4)
Dichloropropene; 1,3-Dichloropropene; 2,3-Dichloropropene	100 (45.4)
2,2-Dichloropropionic acid	5000 (2270)
Dichlorvos	10 (4.54)
Dicofol	10 (4.54)
Dieldrin	1 (0.454)
1,2:3,4-Diepoxybutane	10 (4.54)
Diethanolamine	100 (45.4)
Diethylamine	100 (45.4)
N,N-Diethylaniline	1000 (454)
Diethylarsine	1 (0.454)
Diethylene glycol, dicarbamate	5000 (2270)
1,4-Diethyleneoxide	100 (45.4)
Diethylhexyl phthalate	100 (45.4)
N,N'-Diethylhydrazine	10 (4.54)
O,O-Diethyl S-methyl dithiophosphate	5000 (2270)
Diethyl-p-nitrophenyl phosphate	100 (45.4)
Diethyl phthalate	1000 (454)
O,O-Diethyl O-pyrazinyl phosphorothioate	100 (45.4)
Diethylstilbestrol	1 (0.454)
Diethyl sulfate	10 (4.54)
Dihydrosafrole	10 (4.54)
Diisopropylfluorophosphate (DFP)	100 (45.4)
1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha, 4alpha, 4abeta, 5alpha, 8alpha, 8abeta)-	1 (0.454)
1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha, 4alpha, 4abeta, 5beta, 8beta, 8abeta)-1 (0.454)	
2,7:3,6-Dimethanonaphth[2,3-b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2aalpha, 3beta, 6beta, 6aalpha, 7beta, 7aalpha)-	1 (0.454)
2,7:3,6-Dimethanonaphth[2, 3-b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2abeta, 3alpha, 6alpha, 6abeta, 7beta, 7aalpha)-, & metabolites	1 (0.454)
Dimethoate	10 (4.54)
3,3'-Dimethoxybenzidine	100 (45.4)
Dimethylamine	1000 (454)
Dimethyl aminoazobenzene	10 (4.54)
p-Dimethylaminoazobenzene	10 (4.54)
N,N-Dimethylaniline	100 (45.4)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
7,12-Dimethylbenz[a]anthracene	1 (0.454)
3,3'-Dimethylbenzidine	10 (4.54)
alpha,alpha-Dimethylbenzylhydroperoxide	10 (4.54)
Dimethylcarbamoyl chloride	1 (0.454)
Dimethylformamide	100 (45.4)
1,1-Dimethylhydrazine	10 (4.54)
1,2-Dimethylhydrazine	1 (0.454)
Dimethylhydrazine, unsymmetrical[@]	10 (4.54)
alpha,alpha-Dimethylphenethylamine	5000 (2270)
2,4-Dimethylphenol	100 (45.4)
Dimethyl phthalate	5000 (2270)
Dimethyl sulfate	100 (45.4)
Dimetilan	1 (0.454)
Dinitrobenzene (mixed); m-Dinitrobenzene; o-Dinitrobenzene; p-Dinitrobenzene	100 (45.4)
4,6-Dinitro-o-cresol, and salts	10 (4.54)
Dinitrogen tetroxide[@]	10 (4.54)
Dinitrophenol; 2,4-Dinitrophenol; 2,5-Dinitrophenol; 2,6-Dinitrophenol	10 (4.54)
Dinitrotoluene; 3,4-Dinitrotoluene	10 (4.54)
2,4-Dinitrotoluene	10 (4.54)
2,6-Dinitrotoluene	100 (45.4)
Dinoseb	1000 (454)
Di-n-octyl phthalate	5000 (2270)
1,4-Dioxane	100 (45.4)
1,2-Diphenylhydrazine	10 (4.54)
Diphosphoramide, octamethyl-	100 (45.4)
Diphosphoric acid, tetraethyl ester	10 (4.54)
Dipropylamine	5000 (2270)
Di-n-propylnitrosamine	10 (4.54)
Diquat	1000 (454)
Disulfoton	1 (0.454)
Dithiobiuret	100 (45.4)
1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, O-[(methylamino)-carbonyl]oxime	100 (45.4)
Diuron	100 (45.4)
Dodecylbenzenesulfonic acid	1000 (454)
Endosulfan	1 (0.454)
alpha-Endosulfan	1 (0.454)
beta-Endosulfan	1 (0.454)
Endosulfan sulfate	1 (0.454)
Endothall	1000 (454)
Endrin	1 (0.454)
Endrin aldehyde	1 (0.454)
Endrin, & metabolites	1 (0.454)
Epichlorohydrin	100 (45.4)
Epinephrine	1000 (454)
1,2-Epoxybutane	100 (45.4)
Ethanal	1000 (454)
Ethanamine, N,N-diethyl-	5000 (2270)
Ethanamine, N-ethyl-N-nitroso-	1 (0.454)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-	5000 (2270)
Ethane, 1,2-dibromo-	1 (0.454)
Ethane, 1,1-dichloro-	1000 (454)
Ethane, 1,2-dichloro-	100 (45.4)
Ethanedinitrile	100 (45.4)
Ethane, hexachloro-	100 (45.4)
Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	1000 (454)
Ethane, 1,1'-oxybis-	100 (45.4)
Ethane, 1,1'-oxybis[2-chloro-	10 (4.54)
Ethane, pentachloro-	10 (4.54)
Ethane, 1,1,1,2-tetrachloro-	100 (45.4)
Ethane, 1,1,2,2-tetrachloro-	100 (45.4)
Ethanethioamide	10 (4.54)
Ethane, 1,1,1-trichloro-	1000 (454)
Ethane, 1,1,2-trichloro-	100 (45.4)
Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-, methyl ester	5000 (2270)
Ethanimidothioic acid, 2-(dimethylamino)-N-[[(methylamino) carbonyl]oxy]-2-oxo-, methyl ester	100 (45.4)
Ethanimidothioic acid, N-[[(methylamino) carbonyl]oxy]-, methyl ester	100 (45.4)
Ethanimidothioic acid, N,N'[thiobis[(methylimino)carbonyloxy]] bis-, dimethyl ester	100 (45.4)
Ethanol, 2-ethoxy-	1000 (454)
Ethanol, 2,2'-(nitrosoimino)bis-	1 (0.454)
Ethanol, 2,2'-oxybis-, dicarbamate	5000 (2270)
Ethanone, 1-phenyl-	5000 (2270)
Ethene, chloro-	1 (0.454)
Ethene, (2-chloroethoxy)-	1000 (454)
Ethene, 1,1-dichloro-	100 (45.4)
Ethene, 1,2-dichloro-(E)	1000 (454)
Ethene, tetrachloro-	100 (45.4)
Ethene, trichloro-	100 (45.4)
Ethion	10 (4.54)
Ethyl acetate	5000 (2270)
Ethyl acrylate	1000 (454)
Ethylbenzene	1000 (454)
Ethyl carbamate	100 (45.4)
Ethyl chloride	100 (45.4)
Ethyl cyanide	10 (4.54)
Ethylenebisdithiocarbamic acid, salts & esters	5000 (2270)
Ethylenediamine	5000 (2270)
Ethylenediamine-tetraacetic acid (EDTA)	5000 (2270)
Ethylene dibromide	1 (0.454)
Ethylene dichloride	100 (45.4)
Ethylene glycol	5000 (2270)
Ethylene glycol monoethyl ether	1000 (454)
Ethylene oxide	10 (4.54)
Ethylenethiourea	10 (4.54)
Ethylenimine	1 (0.454)
Ethyl ether	100 (45.4)
Ethylidene dichloride	1000 (454)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Ethyl methacrylate	1000 (454)
Ethyl methanesulfonate	1 (0.454)
Ethyl methyl ketone[@]	5000 (2270)
Famphur	1000 (454)
Ferric ammonium citrate	1000 (454)
Ferric ammonium oxalate	1000 (454)
Ferric chloride	1000 (454)
Ferric fluoride	100 (45.4)
Ferric nitrate	1000 (454)
Ferric sulfate	1000 (454)
Ferrous ammonium sulfate	1000 (454)
Ferrous chloride	100 (45.4)
Ferrous sulfate	1000 (454)
Fluoranthene	100 (45.4)
Fluorene	5000 (2270)
Fluorine	10 (4.54)
Fluoroacetamide	100 (45.4)
Fluoroacetic acid, sodium salt	10 (4.54)
Formaldehyde	100 (45.4)
Formetanate hydrochloride	100 (45.4)
Formic acid	5000 (2270)
Formparanate	100 (45.4)
Fulminic acid, mercury(2+)salt	10 (4.54)
Fumaric acid	5000 (2270)
Furan	100 (45.4)
2-Furancarboxyaldehyde	5000 (2270)
2,5-Furandione	5000 (2270)
Furan, tetrahydro-	1000 (454)
Furfural	5000 (2270)
Furfuran	100 (45.4)
Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D-	1 (0.454)
D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)-carbonyl]amino]-	1 (0.454)
Glycidylaldehyde	10 (4.54)
Guanidine, N-methyl-N'-nitro-N-nitroso-	10 (4.54)
Guthion	1 (0.454)
Heptachlor	1 (0.454)
Heptachlor epoxide	1 (0.454)
Hexachlorobenzene	10 (4.54)
Hexachlorobutadiene	1 (0.454)
Hexachlorocyclopentadiene	10 (4.54)
Hexachloroethane	100 (45.4)
Hexachlorophene	100 (45.4)
Hexachloropropene	1000 (454)
Hexaethyl tetraphosphate	100 (45.4)
Hexamethylene-1,6-diisocyanate	100 (45.4)
Hexamethylphosphoramide	1 (0.454)
Hexane	5000 (2270)
Hexone	5000 (2270)
Hydrazine	1 (0.454)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Hydrazinecarbothioamide	100 (45.4)
Hydrazine, 1,2-diethyl-	10 (4.54)
Hydrazine, 1,1-dimethyl-	10 (4.54)
Hydrazine, 1,2-dimethyl-	1 (0.454)
Hydrazine, 1,2-diphenyl-	10 (4.54)
Hydrazine, methyl-	10 (4.54)
Hydrochloric acid	5000 (2270)
Hydrocyanic acid	10 (4.54)
Hydrofluoric acid	100 (45.4)
Hydrogen chloride	5000 (2270)
Hydrogen cyanide	10 (4.54)
Hydrogen fluoride	100 (45.4)
Hydrogen phosphide	100 (45.4)
Hydrogen sulfide H2S	100 (45.4)
Hydroperoxide, 1-methyl-1-phenylethyl-	10 (4.54)
Hydroquinone	100 (45.4)
2-Imidazolidinethione	10 (4.54)
Indeno(1,2,3-cd)pyrene	100 (45.4)
Iodomethane	100 (45.4)
1,3-Isobenzofurandione	5000 (2270)
Isobutyl alcohol	5000 (2270)
Isodrin	1 (0.454)
Isolan	100 (45.4)
Isophorone	5000 (2270)
Isoprene	100 (45.4)
Isopropanolamine dodecylbenzenesulfonate	1000 (454)
3-Isopropylphenyl N-methylcarbamate	10 (4.54)
Isosafrole	100 (45.4)
3(2H)-Isoxazolone, 5-(aminomethyl)-	1000 (454)
Kepone	1 (0.454)
Lasiocarpine	10 (4.54)
Lead[¢]	10 (4.54)
Lead acetate	10 (4.54)
Lead arsenate	1 (0.454)
Lead, bis(acetato-O)tetrahydroxytri-	10 (4.54)
Lead chloride	10 (4.54)
Lead fluoborate	10 (4.54)
Lead fluoride	10 (4.54)
Lead iodide	10 (4.54)
Lead nitrate	10 (4.54)
Lead phosphate	10 (4.54)
Lead stearate	10 (4.54)
Lead subacetate	10 (4.54)
Lead sulfate	10 (4.54)
Lead sulfide	10 (4.54)
Lead thiocyanate	10 (4.54)
Lindane	1 (0.454)
Lindane (all isomers)	1 (0.454)
Lithium chromate	10 (4.54)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Malathion	100 (45.4)
Maleic acid	5000 (2270)
Maleic anhydride	5000 (2270)
Maleic hydrazide	5000 (2270)
Malononitrile	1000 (454)
Manganese, bis(dimethylcarbamodithioato-S,S')-	10 (4.54)
Manganese dimethyldithiocarbamate	10 (4.54)
MDI	5000 (2270)
MEK	5000 (2270)
Melphalan	1 (0.454)
Mercaptodimethur	10 (4.54)
Mercuric cyanide	1 (0.454)
Mercuric nitrate	10 (4.54)
Mercuric sulfate	10 (4.54)
Mercuric thiocyanate	10 (4.54)
Mercurous nitrate	10 (4.54)
Mercury	1 (0.454)
Mercury, (acetato-O)phenyl-	100 (45.4)
Mercury fulminate	10 (4.54)
Methacrylonitrile	1000 (454)
Methanamine, N-methyl-	1000 (454)
Methanamine, N-methyl-N-nitroso-	10 (4.54)
Methane, bromo-	1000 (454)
Methane, chloro-	100 (45.4)
Methane, chloromethoxy-	10 (4.54)
Methane, dibromo-	1000 (454)
Methane, dichloro-	1000 (454)
Methane, dichlorodifluoro-	5000 (2270)
Methane, iodo-	100 (45.4)
Methane, isocyanato-	10 (4.54)
Methane, oxybis(chloro-	10 (4.54)
Methanesulfenyl chloride, trichloro-	100 (45.4)
Methanesulfonic acid, ethyl ester	1 (0.454)
Methane, tetrachloro-	10 (4.54)
Methane, tetranitro-	10 (4.54)
Methanethiol	100 (45.4)
Methane, tribromo-	100 (45.4)
Methane, trichloro-	10 (4.54)
Methane, trichlorofluoro-	5000 (2270)
Methanimidamide, N,N-dimethyl-N'-[3-[[(methylamino) carbonyl] oxy] phenyl]-, monohydrochloride	100 (45.4)
Methanimidamide, N,N-dimethyl-N'-[2-methyl-4-[[(methylamino)carbonyl] oxy]phenyl]-	100 (45.4)
6,9-Methano-2,4,3-benzodioxathiepin,6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide	1 (0.454)
4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	1 (0.454)
4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-	1 (0.454)
Methanol	5000 (2270)
Methapyrilene	5000 (2270)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-	1 (0.454)
Methiocarb	10 (4.54)
Methomyl	100 (45.4)
Methoxychlor	1 (0.454)
Methyl alcohol	5000 (2270)
Methylamine[@]	100 (45.4)
2-Methyl aziridine	1 (0.454)
Methyl bromide	1000 (454)
1-Methylbutadiene	100 (45.4)
Methyl chloride	100 (45.4)
Methyl chlorocarbonate	1000 (454)
Methyl chloroform	1000 (454)
Methyl chloroformate[@]	1000 (454)
Methyl chloromethyl ether[@]	10 (4.54)
3-Methylcholanthrene	10 (4.54)
4,4'-Methylenebis(2-chloroaniline)	10 (4.54)
Methylene bromide	1000 (454)
Methylene chloride	1000 (454)
4,4'-Methylenedianiline	10 (4.54)
Methylene diphenyl diisocyanate	5000 (2270)
Methyl ethyl ketone	5000 (2270)
Methyl ethyl ketone peroxide	10 (4.54)
Methyl hydrazine	10 (4.54)
Methyl iodide	100 (45.4)
Methyl isobutyl ketone	5000 (2270)
Methyl isocyanate	10 (4.54)
2-Methyllactonitrile	10 (4.54)
Methyl mercaptan	100 (45.4)
Methyl methacrylate	1000 (454)
Methyl parathion	100 (45.4)
4-Methyl-2-pentanone	5000 (2270)
Methyl tert-butyl ether	1000 (454)
Methylthiouracil	10 (4.54)
Metolcarb	1000 (454)
Mevinphos	10 (4.54)
Mexacarbate	1000 (454)
Mitomycin C	10 (4.54)
MNNG	10 (4.54)
Monoethylamine	100 (45.4)
Monomethylamine	100 (45.4)
Naled	10 (4.54)
5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-	10 (4.54)
1-Naphthalenamine	100 (45.4)
2-Naphthalenamine	10 (4.54)
Naphthalenamine, N,N'-bis(2-chloroethyl)-	100 (45.4)
Naphthalene	100 (45.4)
Naphthalene, 2-chloro-	5000 (2270)
1,4-Naphthalenedione	5000 (2270)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt	10 (4.54)
1-Naphthalenol, methylcarbamate	100 (45.4)
Naphthenic acid	100 (45.4)
1,4-Naphthoquinone	5000 (2270)
alpha-Naphthylamine	100 (45.4)
beta-Naphthylamine	10 (4.54)
alpha-Naphthylthiourea	100 (45.4)
Nickel[¢]	100 (45.4)
Nickel ammonium sulfate	100 (45.4)
Nickel carbonyl Ni(CO)4, (T-4)-	10 (4.54)
Nickel chloride	100 (45.4)
Nickel cyanide $Ni(CN)_2$	10 (4.54)
Nickel hydroxide	10 (4.54)
Nickel nitrate	100 (45.4)
Nickel sulfate	100 (45.4)
Nicotine, & salts	100 (45.4)
Nitric acid	1000 (454)
Nitric acid, thallium (1+) salt	100 (45.4)
Nitric oxide	10 (4.54)
p-Nitroaniline	5000 (2270)
Nitrobenzene	1000 (454)
4-Nitrobiphenyl	10 (4.54)
Nitrogen dioxide	10 (4.54)
Nitrogen oxide NO	10 (4.54)
Nitrogen oxide NO_2	10 (4.54)
Nitroglycerine	10 (4.54)
Nitrophenol (mixed); m-Nitrophenol	100 (45.4)
o-Nitrophenol	100 (45.4)
p-Nitrophenol	100 (45.4)
2-Nitrophenol	100 (45.4)
4-Nitrophenol	100 (45.4)
2-Nitropropane	10 (4.54)
N-Nitrosodi-n-butylamine	10 (4.54)
N-Nitrosodiethanolamine	1 (0.454)
N-Nitrosodiethylamine	1 (0.454)
N-Nitrosodimethylamine	10 (4.54)
N-Nitrosodiphenylamine	100 (45.4)
N-Nitroso-N-ethylurea	1 (0.454)
N-Nitroso-N-methylurea	1 (0.454)
N-Nitroso-N-methylurethane	1 (0.454)
N-Nitrosomethylvinylamine	10 (4.54)
N-Nitrosomorpholine	1 (0.454)
N-Nitrosopiperidine	10 (4.54)
N-Nitrosopyrrolidine	1 (0.454)
Nitrotoluene; m-Nitrotoluene; o-Nitrotoluene; p-Nitrotoluene	1000 (454)
5-Nitro-o-toluidine	100 (45.4)
Octamethylpyrophosphoramide	100 (45.4)
Osmium oxide OsO_4, (T-4)-	1000 (454)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Osmium tetroxide	1000 (454)
7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	1000 (454)
Oxamyl	100 (45.4)
1,2-Oxathiolane, 2,2-dioxide	10 (4.54)
2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl) tetrahydro-, 2-oxide	10 (4.54)
Oxirane	10 (4.54)
Oxiranecarboxyaldehyde	10 (4.54)
Oxirane, (chloromethyl)-	100 (45.4)
Paraformaldehyde	1000 (454)
Paraldehyde	1000 (454)
Parathion	10 (4.54)
PCBs	1 (0.454)
PCNB	100 (45.4)
Pentachlorobenzene	10 (4.54)
Pentachloroethane	10 (4.54)
Pentachloronitrobenzene	100 (45.4)
Pentachlorophenol	10 (4.54)
1,3-Pentadiene	100 (45.4)
Perchloroethylene	100 (45.4)
Perchloromethyl mercaptan[@]	100 (45.4)
Phenacetin	100 (45.4)
Phenanthrene	5000 (2270)
Phenol	1000 (454)
Phenol, 2-chloro-	100 (45.4)
Phenol, 4-chloro-3-methyl-	5000 (2270)
Phenol, 2-cyclohexyl-4,6-dinitro-	100 (45.4)
Phenol, 2,4-dichloro-	100 (45.4)
Phenol, 2,6-dichloro-	100 (45.4)
Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)	1 (0.454)
Phenol, 2,4-dimethyl-	100 (45.4)
Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester)	1000 (454)
Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate	10 (4.54)
Phenol, 2,4-dinitro-	10 (4.54)
Phenol, methyl-	100 (45.4)
Phenol, 2-methyl-4,6-dinitro-, & salts	10 (4.54)
Phenol, 2,2'-methylenebis[3,4,6-trichloro-	100 (45.4)
Phenol, 2-(1-methylethoxy)-, methylcarbamate	100 (45.4)
Phenol, 3-(1-methylethyl)-, methyl carbamate	10 (4.54)
Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate	1000 (454)
Phenol, 2-(1-methylpropyl)-4,6-dinitro-	1000 (454)
Phenol, 4-nitro-	100 (45.4)
Phenol, pentachloro-	10 (4.54)
Phenol, 2,3,4,6-tetrachloro-	10 (4.54)
Phenol, 2,4,5-trichloro-	10 (4.54)
Phenol, 2,4,6-trichloro-	10 (4.54)
Phenol, 2,4,6-trinitro-, ammonium salt	10 (4.54)
L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-	1 (0.454)
p-Phenylenediamine	5000 (2270)
Phenyl mercaptan[@]	100 (45.4)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Phenylmercury acetate	100 (45.4)
Phenylthiourea	100 (45.4)
Phorate	10 (4.54)
Phosgene	10 (4.54)
Phosphine	100 (45.4)
Phosphoric acid	5000 (2270)
Phosphoric acid, diethyl 4-nitrophenyl ester	100 (45.4)
Phosphoric acid, lead(2+) salt (2:3)	10 (4.54)
Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester	1 (0.454)
Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester	10 (4.54)
Phosphorodithioic acid, O,O-diethyl S-methyl ester	5000 (2270)
Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester	10 (4.54)
Phosphorofluoridic acid, bis(1-methylethyl) ester	100 (45.4)
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	10 (4.54)
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	100 (45.4)
Phosphorothioic acid, O-[4-[(dimethylamino) sulfonyl]phenyl] O,O-dimethyl ester	1000 (454)
Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	100 (45.4)
Phosphorus	1 (0.454)
Phosphorus oxychloride	1000 (454)
Phosphorus pentasulfide	100 (45.4)
Phosphorus sulfide	100 (45.4)
Phosphorus trichloride	1000 (454)
Phthalic anhydride	5000 (2270)
Physostigmine	100 (45.4)
Physostigmine salicylate	100 (45.4)
2-Picoline	5000 (2270)
Piperidine, 1-nitroso-	10 (4.54)
Plumbane, tetraethyl-	10 (4.54)
POLYCHLORINATED BIPHENYLS	1 (0.454)
Potassium arsenate	1 (0.454)
Potassium arsenite	1 (0.454)
Potassium bichromate	10 (4.54)
Potassium chromate	10 (4.54)
Potassium cyanide K(CN)	10 (4.54)
Potassium hydroxide	1000 (454)
Potassium permanganate	100 (45.4)
Potassium silver cyanide	1 (0.454)
Promecarb	1000 (454)
Pronamide	5000 (2270)
Propanal, 2-methyl-2-(methyl-sulfonyl)-, O-[(methylamino)carbonyl] oxime	100 (45.4)
Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl] oxime	1 (0.454)
1-Propanamine	5000 (2270)
1-Propanamine, N-propyl-	5000 (2270)
1-Propanamine, N-nitroso-N-propyl-	10 (4.54)
Propane, 1,2-dibromo-3-chloro-	1 (0.454)
Propane, 1,2-dichloro-	1000 (454)
Propanedinitrile	1000 (454)
Propanenitrile	10 (4.54)
Propanenitrile, 3-chloro-	1000 (454)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Propanenitrile, 2-hydroxy-2-methyl-	10 (4.54)
Propane, 2-nitro-	10 (4.54)
Propane, 2,2'-oxybis[2-chloro-	1000 (454)
1,3-Propane sultone	10 (4.54)
1,2,3-Propanetriol, trinitrate	10 (4.54)
Propanoic acid, 2-(2,4,5-trichlorophenoxy)-	100 (45.4)
1-Propanol, 2,3-dibromo-, phosphate (3:1)	10 (4.54)
1-Propanol, 2-methyl-	5000 (2270)
2-Propanone	5000 (2270)
2-Propanone, 1-bromo-	1000 (454)
Propargite	10 (4.54)
Propargyl alcohol	1000 (454)
2-Propenal	1 (0.454)
2-Propenamide	5000 (2270)
1-Propene, 1,3-dichloro-	100 (45.4)
1-Propene, 1,1,2,3,3,3-hexachloro-	1000 (454)
2-Propenenitrile	100 (45.4)
2-Propenenitrile, 2-methyl-	1000 (454)
2-Propenoic acid	5000 (2270)
2-Propenoic acid, ethyl ester	1000 (454)
2-Propenoic acid, 2-methyl-, ethyl ester	1000 (454)
2-Propenoic acid, 2-methyl-, methyl ester	1000 (454)
2-Propen-1-ol	100 (45.4)
Propham	1000 (454)
beta-Propiolactone	10 (4.54)
Propionaldehyde	1000 (454)
Propionic acid	5000 (2270)
Propionic anhydride	5000 (2270)
Propoxur (Baygon)	100 (45.4)
n-Propylamine	5000 (2270)
Propylene dichloride	1000 (454)
Propylene oxide	100 (45.4)
1,2-Propylenimine	1 (0.454)
2-Propyn-1-ol	1000 (454)
Prosulfocarb	5000 (2270)
Pyrene	5000 (2270)
Pyrethrins	1 (0.454)
3,6-Pyridazinedione, 1,2-dihydro-	5000 (2270)
4-Pyridinamine	1000 (454)
Pyridine	1000 (454)
Pyridine, 2-methyl-	5000 (2270)
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts	100 (45.4)
2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	10 (4.54)
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	10 (4.54)
Pyrrolidine, 1-nitroso-	1 (0.454)
Pyrrolo[2,3-b] indol-5-ol,1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-, methylcarbamate (ester), (3aS-cis)-	100 (45.4)
Quinoline	5000 (2270)
Quinone	10 (4.54)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Quintobenzene	100 (45.4)
Reserpine	5000 (2270)
Resorcinol	5000 (2270)
Safrole	100 (45.4)
Selenious acid	10 (4.54)
Selenious acid, dithallium (1+) salt	1000 (454)
Selenium[¢]	100 (45.4)
Selenium dioxide	10 (4.54)
Selenium oxide	10 (4.54)
Selenium sulfide SeS2	10 (4.54)
Selenourea	1000 (454)
L-Serine, diazoacetate (ester)	1 (0.454)
Silver[¢]	1000 (454)
Silver cyanide Ag(CN)	1 (0.454)
Silver nitrate	1 (0.454)
Silvex (2,4,5-TP)	100 (45.4)
Sodium	10 (4.54)
Sodium arsenate	1 (0.454)
Sodium arsenite	1 (0.454)
Sodium azide	1000 (454)
Sodium bichromate	10 (4.54)
Sodium bifluoride	100 (45.4)
Sodium bisulfite	5000 (2270)
Sodium chromate	10 (4.54)
Sodium cyanide Na(CN)	10 (4.54)
Sodium dodecylbenzenesulfonate	1000 (454)
Sodium fluoride	1000 (454)
Sodium hydrosulfide	5000 (2270)
Sodium hydroxide	1000 (454)
Sodium hypochlorite	100 (45.4)
Sodium methylate	1000 (454)
Sodium nitrite	100 (45.4)
Sodium phosphate, dibasic	5000 (2270)
Sodium phosphate, tribasic	5000 (2270)
Sodium selenite	100 (45.4)
Streptozotocin	1 (0.454)
Strontium chromate	10 (4.54)
Strychnidin-10-one, & salts	10 (4.54)
Strychnidin-10-one, 2,3-dimethoxy-	100 (45.4)
Strychnine, & salts	10 (4.54)
Styrene	1000 (454)
Styrene oxide	100 (45.4)
Sulfur chlorides[@]	1000 (454)
Sulfuric acid	1000 (454)
Sulfuric acid, dimethyl ester	100 (45.4)
Sulfuric acid, dithallium (1+) salt	100 (45.4)
Sulfur monochloride	1000 (454)
Sulfur phosphide	100 (45.4)
2,4,5-T	1000 (454)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
2,4,5-T acid	1000 (454)
2,4,5-T amines	5000 (2270)
2,4,5-T esters	1000 (454)
2,4,5-T salts	1000 (454)
TCDD	1 (0.454)
TDE	1 (0.454)
1,2,4,5-Tetrachlorobenzene	5000 (2270)
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1 (0.454)
1,1,1,2-Tetrachloroethane	100 (45.4)
1,1,2,2-Tetrachloroethane	100 (45.4)
Tetrachloroethylene	100 (45.4)
2,3,4,6-Tetrachlorophenol	10 (4.54)
Tetraethyl pyrophosphate	10 (4.54)
Tetraethyl lead	10 (4.54)
Tetraethyldithiopyrophosphate	100 (45.4)
Tetrahydrofuran	1000 (454)
Tetranitromethane	10 (4.54)
Tetraphosphoric acid, hexaethyl ester	100 (45.4)
Thallic oxide	100 (45.4)
Thallium[¢]	1000 (454)
Thallium (I) acetate	100 (45.4)
Thallium (I) carbonate	100 (45.4)
Thallium chloride TlCl	100 (45.4)
Thallium (I) nitrate	100 (45.4)
Thallium oxide Tl_2O_3	100 (45.4)
Thallium (I) selenite	1000 (454)
Thallium (I) sulfate	100 (45.4)
Thioacetamide	10 (4.54)
Thiodicarb	100 (45.4)
Thiodiphosphoric acid, tetraethyl ester	100 (45.4)
Thiofanox	100 (45.4)
Thioimidodicarbonic diamide $[(H_2N)C(S)]_2NH$	100 (45.4)
Thiomethanol	100 (45.4)
Thioperoxydicarbonic diamide $[(H_2N)C(S)]_2S_2$, tetramethyl-	10 (4.54)
Thiophanate-methyl	10 (4.54)
Thiophenol	100 (45.4)
Thiosemicarbazide	100 (45.4)
Thiourea	10 (4.54)
Thiourea, (2-chlorophenyl)-	100 (45.4)
Thiourea, 1-naphthalenyl-	100 (45.4)
Thiourea, phenyl-	100 (45.4)
Thiram	10 (4.54)
Tirpate	100 (45.4)
Titanium tetrachloride	1000 (454)
Toluene	1000 (454)
Toluenediamine	10 (4.54)
2,4-Toluene diamine	10 (4.54)
Toluene diisocyanate	100 (45.4)
2,4-Toluene diisocyanate	100 (45.4)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
o-Toluidine	100 (45.4)
p-Toluidine	100 (45.4)
o-Toluidine hydrochloride	100 (45.4)
Toxaphene	1 (0.454)
2,4,5-TP acid	100 (45.4)
2,4,5-TP esters	100 (45.4)
Triallate	100 (45.4)
1H-1,2,4-Triazol-3-amine	10 (4.54)
Trichlorfon	100 (45.4)
1,2,4-Trichlorobenzene	100 (45.4)
1,1,1-Trichloroethane	1000 (454)
1,1,2-Trichloroethane	100 (45.4)
Trichloroethylene	100 (45.4)
Trichloromethanesulfenyl chloride	100 (45.4)
Trichloromonofluoromethane	5000 (2270)
Trichlorophenol; 2,3,4-Trichlorophenol; 2,3,5-Trichlorophenol; 2,3,6-Trichlorophenol; 3,4,5-Trichlorophenol	10 (4.54)
2,4,5-Trichlorophenol	10 (4.54)
2,4,6-Trichlorophenol	10 (4.54)
Triethanolamine dodecylbenzenesulfonate	1000 (454)
Triethylamine	5000 (2270)
Trifluralin	10 (4.54)
Trimethylamine	100 (45.4)
2,2,4-Trimethylpentane	1000 (454)
1,3,5-Trinitrobenzene	10 (4.54)
1,3,5-Trioxane, 2,4,6-trimethyl-	1000 (454)
Tris(2,3-dibromopropyl) phosphate	10 (4.54)
Trypan blue	10 (4.54)
D002 Unlisted Hazardous Wastes Characteristic of Corrosivity	100 (45.4)
D001 Unlisted Hazardous Wastes Characteristic of Ignitability	100 (45.4)
D003 Unlisted Hazardous Wastes Characteristic of Reactivity	100 (45.4)
D004–D043 Unlisted Hazardous Wastes Characteristic of Toxicity:	
Arsenic (D004)	1 (0.454)
Barium (D005)	1000 (454)
Benzene (D018)	10 (4.54)
Cadmium (D006)	10 (4.54)
Carbon tetrachloride (D019)	10 (4.54)
Chlordane (D020)	1 (0.454)
Chlorobenzene (D021)	100 (45.4)
Chloroform (D022)	10 (4.54)
Chromium (D007)	10 (4.54)
o-Cresol (D023)	100 (45.4)
m-Cresol (D024)	100 (45.4)
p-Cresol (D025)	100 (45.4)
Cresol (D026)	100 (45.4)
2,4-D (D016)	100 (45.4)
1,4-Dichlorobenzene (D027)	100 (45.4)
1,2-Dichloroethane (D028)	100 (45.4)
1,1-Dichloroethylene (D029)	100 (45.4)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
2,4-Dinitrotoluene (D030)	10 (4.54)
Endrin (D012)	1 (0.454)
Heptachlor (and epoxide) (D031)	1 (0.454)
Hexachlorobenzene (D032)	10 (4.54)
Hexachlorobutadiene (D033)	1 (0.454)
Hexachloroethane (D034)	100 (45.4)
Lead (D008)	10 (4.54)
Lindane (D013)	1 (0.454)
Mercury (D009)	1 (0.454)
Methoxychlor (D014)	1 (0.454)
Methyl ethyl ketone (D035)	5000 (2270)
Nitrobenzene (D036)	1000 (454)
Pentachlorophenol (D037)	10 (4.54)
Pyridine (D038)	1000 (454)
Selenium (D010)	10 (4.54)
Silver (D011)	1 (0.454)
Tetrachloroethylene (D039)	100 (45.4)
Toxaphene (D015)	1 (0.454)
Trichloroethylene (D040)	100 (45.4)
2,4,5-Trichlorophenol (D041)	10 (4.54)
2,4,6-Trichlorophenol (D042)	10 (4.54)
2,4,5-TP (D017)	100 (45.4)
Vinyl chloride (D043)	1 (0.454)
Uracil mustard	10 (4.54)
Uranyl acetate	100 (45.4)
Uranyl nitrate	100 (45.4)
Urea, N-ethyl-N-nitroso-	1 (0.454)
Urea, N-methyl-N-nitroso-	1 (0.454)
Urethane	100 (45.4)
Vanadic acid, ammonium salt	1000 (454)
Vanadium oxide V_2O_5	1000 (454)
Vanadium pentoxide	1000 (454)
Vanadyl sulfate	1000 (454)
Vinyl acetate	5000 (2270)
Vinyl acetate monomer	5000 (2270)
Vinylamine, N-methyl-N-nitroso-	10 (4.54)
Vinyl bromide	100 (45.4)
Vinyl chloride	1 (0.454)
Vinylidene chloride	100 (45.4)
Warfarin, & salts	100 (45.4)
Xylene	100 (45.4)
m-Xylene	1000 (454)
o-Xylene	1000 (454)
p-Xylene	100 (45.4)
Xylene (mixed)	100 (45.4)
Xylenes (isomers and mixture)	100 (45.4)
Xylenol	1000 (454)
Yohimban-16-carboxylic acid,11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl) oxy]-, methyl ester (3beta,16beta,17alpha,18beta, 20alpha)	5000 (2270)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
Zinc[¢]	1000 (454)
Zinc acetate	1000 (454)
Zinc ammonium chloride	1000 (454)
Zinc, bis(dimethylcarbamodithioato-S,S')-	10 (4.54)
Zinc borate	1000 (454)
Zinc bromide	1000 (454)
Zinc carbonate	1000 (454)
Zinc chloride	1000 (454)
Zinc cyanide $Zn(CN)_2$	10 (4.54)
Zinc fluoride	1000 (454)
Zinc formate	1000 (454)
Zinc hydrosulfite	1000 (454)
Zinc nitrate	1000 (454)
Zinc phenolsulfonate	5000 (2270)
Zinc phosphide Zn_3P_2	100 (45.4)
Zinc silicofluoride	5000 (2270)
Zinc sulfate	1000 (454)
Ziram	10 (4.54)
Zirconium nitrate	5000 (2270)
Zirconium potassium fluoride	1000 (454)
Zirconium sulfate	5000 (2270)
Zirconium tetrachloride	5000 (2270)
F001	10 (4.54)
(a) Tetrachloroethylene	100 (45.4)
(b) Trichloroethylene	100 (45.4)
(c) Methylene chloride	1000 (454)
(d) 1,1,1-Trichloroethane	1000 (454)
(e) Carbon tetrachloride	10 (4.54)
(f) Chlorinated fluorocarbons	5000 (2270)
F002	10 (4.54)
(a) Tetrachloroethylene	100 (45.4)
(b) Methylene chloride	1000 (454)
(c) Trichloroethylene	100 (45.4)
(d) 1,1,1-Trichloroethane	1000 (454)
(e) Chlorobenzene	100 (45.4)
(f) 1,1,2-Trichloro-1,2,2-trifluoroethane	5000 (2270)
(g) o-Dichlorobenzene	100 (45.4)
(h) Trichlorofluoromethane	5000 (2270)
(i) 1,1,2-Trichloroethane	100 (45.4)
F003	100 (45.4)
(a) Xylene	1000 (454)
(b) Acetone	5000 (2270)
(c) Ethyl acetate	5000 (2270)
(d) Ethylbenzene	1000 (454)
(e) Ethyl ether	100 (45.4)
(f) Methyl isobutyl ketone	5000 (2270)
(g) n-Butyl alcohol	5000 (2270)
(h) Cyclohexanone	5000 (2270)
(i) Methanol	5000 (2270)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
F004	100 (45.4)
(a) Cresols/Cresylic acid	100 (45.4)
(b) Nitrobenzene	1000 (454)
F005	100 (45.4)
(a) Toluene	1000 (454)
(b) Methyl ethyl ketone	5000 (2270)
(c) Carbon disulfide	100 (45.4)
(d) Isobutanol	5000 (2270)
(e) Pyridine	1000 (454)
F006	10 (4.54)
F007	10 (4.54)
F008	10 (4.54)
F009	10 (4.54)
F010	10 (4.54)
F011	10 (4.54)
F012	10 (4.54)
F019	10 (4.54)
F020	1 (0.454)
F021	1 (0.454)
F022	1 (0.454)
F023	1 (0.454)
F024	1 (0.454)
F025	1 (0.454)
F026	1 (0.454)
F027	1 (0.454)
F028	1 (0.454)
F032	1 (0.454)
F034	1 (0.454)
F035	1 (0.454)
F037	1 (0.454)
F038	1 (0.454)
F039	1 (0.454)
K001	1 (0.454)
K002	10 (4.54)
K003	10 (4.54)
K004	10 (4.54)
K005	10 (4.54)
K006	10 (4.54)
K007	10 (4.54)
K008	10 (4.54)
K009	10 (4.54)
K010	10 (4.54)
K011	10 (4.54)
K013	10 (4.54)
K014	5000 (2270)
K015	10 (4.54)
K016	1 (0.454)
K017	10 (4.54)
K018	1 (0.454)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
K019	1 (0.454)
K020	1 (0.454)
K021	10 (4.54)
K022	1 (0.454)
K023	5000 (2270)
K024	5000 (2270)
K025	10 (4.54)
K026	1000 (454)
K027	10 (4.54)
K028	1 (0.454)
K029	1 (0.454)
K030	1 (0.454)
K031	1 (0.454)
K032	10 (4.54)
K033	10 (4.54)
K034	10 (4.54)
K035	1 (0.454)
K036	1 (0.454)
K037	1 (0.454)
K038	10 (4.54)
K039	10 (4.54)
K040	10 (4.54)
K041	1 (0.454)
K042	10 (4.54)
K043	10 (4.54)
K044	10 (4.54)
K045	10 (4.54)
K046	10 (4.54)
K047	10 (4.54)
K048	10 (4.54)
K049	10 (4.54)
K050	10 (4.54)
K051	10 (4.54)
K052	10 (4.54)
K060	1 (0.454)
K061	10 (4.54)
K062	10 (4.54)
K064	10 (4.54)
K065	10 (4.54)
K066	10 (4.54)
K069	10 (4.54)
K071	1 (0.454)
K073	10 (4.54)
K083	100 (45.4)
K084	1 (0.454)
K085	10 (4.54)
K086	10 (4.54)
K087	100 (45.4)
K088	10 (4.54)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
K090	10 (4.54)
K091	10 (4.54)
K093	5000 (2270)
K094	5000 (2270)
K095	100 (45.4)
K096	100 (45.4)
K097	1 (0.454)
K098	1 (0.454)
K099	10 (4.54)
K100	10 (4.54)
K101	1 (0.454)
K102	1 (0.454)
K103	100 (45.4)
K104	10 (4.54)
K105	10 (4.54)
K106	1 (0.454)
K107	10 (4.54)
K108	10 (4.54)
K109	10 (4.54)
K110	10 (4.54)
K111	10 (4.54)
K112	10 (4.54)
K113	10 (4.54)
K114	10 (4.54)
K115	10 (4.54)
K116	10 (4.54)
K117	1 (0.454)
K118	1 (0.454)
K123	10 (4.54)
K124	10 (4.54)
K125	10 (4.54)
K126	10 (4.54)
K131	100 (45.4)
K132	1000 (454)
K136	1 (0.454)
K141	1 (0.454)
K142	1 (0.454)
K143	1 (0.454)
K144	1 (0.454)
K145	1 (0.454)
K147	1 (0.454)
K148	1 (0.454)
K149	10 (4.54)
K150	10 (4.54)
K151	10 (4.54)
K156	10 (4.54)
K157	10 (4.54)
K158	10 (4.54)
K159	10 (4.54)

Table A4.3 Hazardous substance	Reportable Quantity (RQ) pounds (kilograms)
K161	1 (0.454)
K169	10 (4.54)
K170	1 (0.454)
K171	1 (0.454)
K172	1 (0.454)
K174	1 (0.454)
K175	1 (0.454)
K176	1 (0.454)
K177	5000 (2270)
K178	1000 (454)
K181	1 (0.454)

Footnotes:

[¢]The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 micrometers (0.004 inches).

[¢¢]The RQ for asbestos is limited to friable forms only.

[@]Indicates that the name was added by PHMSA because (1) the name is a synonym for a specific hazardous substance and (2) the name appears in the Hazardous Materials Table as a proper shipping name.

Attachment 5

CLASS 1--EXPLOSIVES AND AMMUNITION

A5.1. General Requirements. For military members, failure to obey the mandatory provisions from **paragraphs A5.2** through **A5.27** and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from **paragraph A5.2** through **A5.27** and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and must select the correct inner/intermediate packaging and outer container as specified in each packaging paragraph. Not all packaging paragraphs are inclusive and packaging is based on the category of explosive or ammunition as identified in each paragraph or subparagraph. This attachment contains information concerning packaging and general handling instructions for Class 1 material. See **Attachment 3** for additional information concerning Class 1 material.

A5.2. Unpackaged Explosives. Unless otherwise authorized in this manual, package all explosives according to **Attachment 5**. Explosives may only be removed from their required packaging to meet operational requirements of **Chapter 3** under the following circumstances:

A5.2.1. On airdrop parachute platforms configured according to TO 13C7/FM 10-500 series publications.

A5.2.2. When stored in approved racks or containers, or secured in/on tactical equipment or vehicles as operational components according to technical orders or publications.

A5.2.3. When secured/restrained in freight containers according to service drawings approved for air movement.

A5.3. Items requiring Special Approval. Ship according to a Special Approval (includes CAA or COE) issued for the particular item. See **paragraphs 2.5** and **2.6** for more information on CAAs and COEs. Comply with the following handling instructions only when shipping items containing a fuel that is corrosive or toxic.

A5.3.1. Handling Instructions. Exercise extreme caution in handling this item. Keep well ventilated, away from sparks, fire hazards, and oxidizing materials. Vapors are toxic when inhaled. Liquid is corrosive. Fuel in presence of an oxidizer is self-igniting and highly reactive. Approved protective clothing, gloves, safety goggles, and a positive pressure breathing apparatus must be available during handling of this material.

A5.3.2. Shipping Requirements. The following requirements apply:

A5.3.2.1. Load containers having an installed indicator in such a manner as to provide access to the indicator during flight. Inspect the indicator before aircraft loading, after aircraft loading, at cruise altitude, during flight every hour or as required by the applicable technical manual, as cargo tiedown is inspected, and after landing. The normal color of the indicator is white or off-white. The color will change to yellow if inhibited red fuming nitric acid (IRFNA) leak occurs. The color will change to black if an amine fuel mixture (AFM) leak occurs. Changes are obvious and do not require technical escort personnel to monitor.

A5.3.2.2. Containers that do not have an indicator installed must be preplanned under the same conditions as described in **paragraph 2.8**. The shipper must contact the carrier no less than 72 hours before movement. The shipper must also furnish the following:

A5.3.2.3. Protective clothing, gloves, and a positive pressure breathing apparatus for all personnel aboard the aircraft (see also **paragraph 1.9**).

A5.3.2.4. Fume-detecting equipment.

A5.3.2.5. A qualified technical escort or courier with equipment to monitor the item for leaks and is prepared to take emergency in-flight action.

A5.3.3. Emergency Procedures. When a leak is detected, either by observation of the indicator or by monitoring equipment:

A5.3.3.1. Get personnel out of the cargo compartment.

A5.3.3.2. Alert pilot and crew.

A5.3.3.3. Depressurize cargo compartment and ventilate as soon as possible.

A5.3.3.4. All personnel go on 100 percent oxygen.

A5.3.3.5. Declare an in-flight emergency.

A5.3.3.6. Be prepared to jettison cargo if possible.

A5.3.3.7. Descend and land as soon as possible.

A5.3.3.8. Aircraft must be parked in an isolated area.

A5.3.3.9. Aircraft must be unloaded by EOD personnel as soon as possible.

A5.4. Barium Azide; Barium Styphnate; Diazodinitrophenol, Wetted; Guanyl Nitrosaminoguanylidene Hydrazine, Wetted; Guanyl Nitrosaminoguanyltetrazene, Wetted; Tetrazene, Wetted; Lead Azide, Wetted; Lead Mononitroresorcinate; Lead Styphnate, Wetted; Lead Trinitroresorcinate, Wetted; and Mercury Fulminate, Wetted, must be packaged as follows:

A5.4.1. Fill the intermediate and outer packagings with an appropriate water-saturated material. The outer drum must have a watertight seal (except UN0224 when shipped dry). Package in drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: plastic textile, plastic coated or lined rubber textile, or rubberized textile	Bags: plastic textile, plastic coated or lined rubber textile, or rubberized textile bag *or* Receptacles: plastic or metal	Drums: removable head steel (1A2) or removable head plastic (1H2)

A5.4.2. Inner packagings must not contain more than 50 g of explosive substance (quantity corresponding to dry substance); separate inner packagings from each other with dividing partitions; and do not partition within the outer packaging with more than 25 compartments. Package in boxes as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: conductive rubber or plastic *or* Receptacles: conductive rubber or plastic, metal, or wood	Dividing Partitions: metal, wood, plastic, or fiberboard	Boxes: natural wood, sift-proof wall (4C2), plywood (4D), or reconstituted wood (4F)

A5.5. Powder Cake or Powder Paste, Wetted; or Nitrocellulose Plasticized. Package in boxes or drums as follows:

Inner packaging	Outer packaging
Bags: waterproof paper, plastic, or rubberized textile *or* Sheets: plastic or rubberized textile Note: Inner packagings are not required for UN0159 when metal (1A2 or 1B2) or plastic (1H2) drums are used as the outer packaging.	Boxes: steel (4A), aluminum (4B), fiberboard (4G), ordinary wood (4C1), natural sift-proof wood (4C2), plywood (4D), reconstituted wood (4F), expanded plastic (4H1), or solid plastic (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), or fiberboard (1G)

A5.6. Ammonium Picrate; Cyclotetramethylenetetranitramine, HMX, or Octogen Wetted; Cyclotrimethylenetrinitramine and Octogen, Mixtures, Wetted or Desensitized; Cyclotrimethylenetrinitramine, Cyclonite, Hexogen, or RDX Wetted; Cyclotrimethylenetrinitramine and Cyclotetramethylenetetranitramine, Mixtures, Wetted or Desensitized; Cyclotrimethylenetrinitramine and HMX Mixtures, Wetted or Desensitized; Dinitrophenol; Dinitroresorcinol; Dipicryl Sulfide; Hexolite or Hexotol; Hexotonal; Mannitol Hexanitrate or Nitromannite, Wetted; Nitrocellulose; Nitrostarch; Nitro Urea; Nitroguanidine or Picrite Trinitrophenol or Picric Acid; Octolite or Octol; Pentolite; Pentaerythrite Tetranitrate or Pentaerythritol Tetranitrate or PETN, Wetted; or Pentaerythrite Tetranitrate or Pentaerythritol Tetranitrate or PETN, Desensitized; RDX and Cyclotetramethylenetetranitramine, Wetted or Desensitized; Trinitrobenzene; Trinitrobenzoic Acid; Trinitroresorcinol or Styphnic Acid; Trinitroresorcinol, Wetted; Trinitrotoluene or TNT Tritonal; RDX and HMX Mixtures, Wetted or Desensitized Urea Nitrate. Packaging must be lead free for UN0004, 0076, 0078, 0154, 0216, 0219, 0386, and 0394.

A5.6.1. Wetted Solids. Package in drums as follows:

Inner packaging	Intermediate packaging	Outer packaging

Inner packaging	Intermediate packaging	Outer packaging
Bags: multiwall water resistant paper, plastic, textile, rubberized textile, woven plastic *or* Receptacles: metal or plastic	Bags: plastics, plastic coated or lined textile *or* Receptacles: metal or plastic Note: Intermediate packaging not required if leakproof drums are used as outer packaging or for UN0072 and UN0226.	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.6.2. Dry Solids Other Than Powders. Package in bags, boxes, or drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic Note: Inner packaging not required for UN0222 and UN0223.	Bags (required for UN0150 only): plastics, plastic coated or lined textile	Bags: sift-proof woven plastic (5H2/3), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3), multiwall water resistant paper (5M2) *or* Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2)

A5.6.3. Solid Dry Powders. Package in boxes as follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging
Bags: multiwall water resistant paper, plastic, woven plastic *or* Receptacles: fiberboard, metal, plastic, wood	Bags: multiwall water resistant paper with inner lining plastic *or* Receptacles: metal or plastic	Boxes: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.6.4. Solid Dry Powders. Package in drums as follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging
Not required	Bags: multiwall water resistant paper with inner lining plastic *or* Receptacles: metal or plastic	Drums: removable head steel (1A2), removable head aluminum (1B2), fiber (1G)

A5.7. Ammonium Nitrate; Ammonium Perchlorate; Cyclotetramethylenetetranitramine, Octogen, or HMX Desensitized; Cyclotrimethylenetrinitramine, Cyclonite, Hexogen, or RDX Desensitized; Dinitroglycoluril or Dingu; Octonal; Tetranitroaniline; Trinitro-Meta-Cresol; Trinitroaniline or Picramide; Trinitroanisole; Trinitrobenzenesulfonic Acid; Trinitrochlorobenzene or Picryl Chloride; Trinitrofluorenone; Trinitronaphthalene; Trinitrophenetole; Trinitrotoluene and Trinitrobenzene Mixtures or TNT and Trinitrobenzene Mixtures or TNT and Hexannitrostilbene Mixtures or Trinitrotoluene and Hexanitrostilnene Mixtures; Trinitrotoluene Mixtures Containing Trinitrobenzene and Hexanitrostilbene or TNT Mixtures containing Trinitrobenzene and Hexanitrostilbene must be packaged as follows. Packaging must be lead free for UN0004, 0076, 0078, 0154, 0216, 0219, and 0386.

A5.7.1. Dry Solids Other Than Powders. Package in bags, boxes, or drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic Note: Inner packaging not required for UN0222 and UN0223.	Bags (required for UN0150 only): plastics, plastic coated or lined textile	Bags: sift-proof woven plastic (5H2/3), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3), multiwall water resistant paper (5M2) *or* Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2)

A5.7.2. Solid Dry Powders. Package in boxes as follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging

Inner packaging	Intermediate packaging	Outer packaging
Bags: multiwall water resistant paper, plastic, woven plastic *or* Receptacles: fiberboard, metal, plastic, wood	Bags: multiwall water resistant paper with inner lining plastic *or* Receptacles: metal or plastic	Boxes: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.7.3. Solid Dry Powders. Package in drums as follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging
Not required	Bags: multiwall water resistant paper with inner lining plastic *or* Receptacles: metal or plastic	Drums: removable head steel (1A2), removable head aluminum (1B2), fiber (1G)

A5.8. Black Powder or Gunpowder; Black Powder, Compressed or Gunpowder, Compressed; Black Powder, in Pellets or Gunpowder, in Pellets, Flash Powder must be packaged as follows. At least one of the packagings must be sift-proof. Do not package more than 50 g (1.8 oz) of flash powder (UN0094 or UN0305) in each inner packaging. Package in boxes or drums as follows:

Inner packaging	Outer packaging
Bags: paper, plastic, or rubberized textile *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: Kraft paper or waxed paper (only authorized for UN0028).	Boxes: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), fiber (1G) Note: Inner packaging not required for UN0027.

A5.9. Deflagrating Metal Salts of Aromatic Nitroderivatives, N.O.S.; Dinitrophenolates; Dinitrosobenzene; Nitrocellulose, Wetted; 5-Mercaptotetrazol-1-Acetic Acid; Tetrazol-1-Acetic Acid; Powder, Smokeless; Propellant, Solid; Sodium Dinitro-O-Cresolate; Sodium Picramate; and Zirconium Picramate must be packaged as follows. Packagings must be lead free for UN0077, 0132, 0234, 0235 and 0236. Use **paragraph A5.9.1** for UN0342. Use **paragraph A5.9.2** for UN0132, 0160, UN0161, 0406, 0497, 0448, 0498, and 0499.

A5.9.1. Wetted Solids. Package in boxes or drums as follows:

Inner packaging	Intermediate packaging	Outer packaging

Inner packaging	Intermediate packaging	Outer packaging
Bags: plastic, textile, woven plastic *or* Receptacles: metal or plastic Note: Inner packaging not required for UN0342 when packed in outer 1A2, 1B2, or 1H2 drum.	Bags: plastic, plastic coated or lined textile *or* Receptacles: metal or plastic Note: Intermediate packaging not required if packed in outer leakproof removable head drum.	Boxes: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G)

A5.9.2. Dry Solids. Package in boxes or drums as follows:

Inner packaging	Outer packaging
Bags: kraft paper, plastic, sift-proof woven plastic or textile *or* Receptacles: fiberboard, metal, paper, plastic Note: Inner packaging not required for UN0160 and 0161 when packed in outer 1A2 or 1B2 drum.	Boxes: ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G) Notes: For UN0160 and 0161, 1A2 and 1B2 drums must be constructed so that risk of explosion caused by increased internal pressure (from internal or external causes) is prevented. For UN0508 and UN0509, metal packagings shall not be used.

A5.10. Nitroglycerin, Desensitized; Nitroglycerin, Solution in Alcohol; and Propellant, Liquid must be packaged as follows. For liquid explosives, surround each inner packaging with sufficient amount of non-combustible absorbent cushioning material to absorb the entire contents. Cushion metal receptacles from each other in all directions. Liquid substances must not freeze at temperatures above 15 degrees C (5 degrees F). A composite packaging consisting of a plastic receptacle in a metal drum (6HA1) may be used instead of the inner and intermediate packagings. Package in boxes or drums as follows:

Inner packaging	Intermediate packaging	Outer packaging

Inner packaging	Intermediate packaging	Outer packaging
Receptacles: metal or plastic Note: Tape screw cap closures and do not exceed 5 liters capacity each (does not apply to UN0144)	Bags: plastic in metal receptacles *or* Drums: metal Note: Intermediate packaging not required for UN0144	Boxes: ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) Note: Maximum net mass for box must not exceed 30 kg. *or* Drums: removable head steel (1A2), removable head aluminum (1B2), plywood (1D), fiber (1G) Note: Maximum net volume for drum must not exceed 120 liters.

A5.11. Ammonium Nitrate-Fuel Oil Mixture; Explosive, Blasting, Type A (UN0081); Explosive, Blasting, Type B (UN0082); and Explosive, Blasting, Type E (UN0241); Explosive, Blasting, Type B (UN0331) or Agent Blasting, Type B; Explosive, Blasting, Type C (UN0083); Explosive, Blasting, Type D (UN0084) and Explosive, Blasting, Type E (UN0332) must be packaged as follows. Inner packaging is not required for UN0082, 0241, 0331, and 0332 when the explosive is contained in a material impervious to liquid.

Package in boxes, drums, jerricans, or bags as follows:

Inner packaging	Outer packaging
Bags: water and oil resistant paper, plastic, plastic coated or lined textile, sift-proof woven plastic *or* Receptacles: water resistant fiberboard, metal, plastic, sift-proof wood *or* Sheets: water resistant paper, waxed paper, plastic Note: Inner packaging not required for UN0082, UN0241, UN0331, and UN0332 if packed in a leakproof outer drum. Note: Inner packaging not required for UN0331 when 5H2, 5H3 or 5H4 bags are outer packaging.	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2) *or* Jerricans: removable head steel (3A2), removable head plastic (3H2) *or* Bags: woven plastic (5H1/2/3), multiwall water resistant paper (5M2), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3) Notes: 5H2 or 5H3 bags only authorized for UN0082, 0241, 0331, and 0332. Do not use for UN0081.

A5.12. Ammunition, Illuminating; Ammunition, Incendiary; Ammunition, Incendiary, White Phosphorus; Ammunition, Practice; Ammunition, Proof; Ammunition, Smoke; Ammunition, Smoke, White Phosphorus; Ammunition, Tear-Producing; Bombs; Bombs, Photo-Flash; Cartridges, Depth; Cartridges for Weapons; Cartridges for Weapons, Blank; Cartridges for Weapons, Inert Projectile; Cartridges, Small Arms; Cartridges, Small Arms, Blank; Charges, Bursting, Charges, Demolition; Plastic Bonded; Charges, Propelling for Cannon; Mines; Projectiles; Rocket Motors; Rockets; Rockets, Line-Throwing; Torpedoes; Warheads, Rocket; and Warheads, Torpedo must be packaged as follows:

A5.12.1. Package in boxes or drums as follows:

Inner packaging	Outer packaging
Inner packaging not required	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.12.2. Large and Robust Articles of UN numbers UN0006, 0009, 0010, 0015, 0016, 0018, 0019, 0034, 0035, 0038, 0039, 0048, 0056, 0137, 0138, 0168, 0169, 0171, 0181, 0182, 0183, 0186, 0221, 0238, 0243, 0244, 0245, 0246, 0254, 0280, 0281, 0286, 0287, 0297, 0299, 0300, 0301, 0303, 0321, 0328, 0329, 0344, 0345 0346, 0347, 0362, 0363, 0370, 0412, 0424, 0425, 0434, 0435, 0436, 0437, 0438, 0451, 0459 and 0488. Large and robust articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked provided that a negative result was obtained in Test Series 4 of the UN Manual of Tests and Criteria on an unpackaged article. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of transport. Such articles will be in DOD-approved containers, crates, cradles, or other suitable handling, storage, or launching devices which have been tested to show that they will not become loose during normal conditions of transport.

A5.13. Detonators, Electric must be packaged as follows: Inner packagings are not required when detonators are packed in pasteboard tubes, or when their leg wires are wound on spools with the caps either placed inside the spool or securely taped to the wire on the spool restricting movement of the caps and protecting from impact. Package in boxes or drums as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic *or* Reels	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.14. Detonators, Non-electric and Detonator Assemblies, Non-electric must be packaged as follows: For detonators assemblies (UN0360, 0361, 0500), detonators are not required to be attached to the safety fuse, metal clad mild detonating cord, detonating cord, or shock tube. Inner packagings are not required if the packing configuration restricts free movement of the caps and protects them from impact forces. Package in boxes or drums as follows:

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic *or* Reels Note: For UN0029, UN0267, and UN0455, bags and reels will not be used as inner packagings.	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.15. Boosters and Charges, Supplementary Explosive must be packaged as follows:

A5.15.1. Package in boxes as follows:

Inner packaging	Outer packaging
Inner packaging not required	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.15.2. Package in combination packages as follows:

Inner packaging	Outer packaging
Receptacles: fiberboard, metal, plastic *or* Sheets: paper, plastic	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.16. Boosters with Detonator; Bursters; Detonators for Ammunition; Grenades, Empty Primed; Primers, Cap Type; Primers, Tubular; and Tracers for Ammunition must be packaged in boxes as follows:

Inner packaging	Intermediate packaging	Outer packaging

Inner packaging	Intermediate packaging	Outer packaging
Receptacles: fiberboard, metal, plastic, wood *or* Trays (fitted with dividing partitions): fiberboard, plastics, wood. Do not use trays for UN0043, 0212, 0225, 0268 or 0306.	Receptacles: fiberboard, metal, plastic, wood. Note: Intermediate packaging only required when trays are used as inner packaging.	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.17. Cutters, Cable, Explosive; Cartridges, Power Device; Cartridges, Oil Well; Fracturing Devices, Explosive; Release Devices, Explosive; Rivets, Explosive; and Sounding Devices, Explosive must be packaged in boxes or drums as follows:

Inner packaging	Outer packaging
Bags: water resistant material *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: fiberboard corrugated *or* Tubes: fiberboard	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastics (4H1), solid plastics (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), fiberboard (1G), plywood (1D), removeable head plastics (1H2)

A5.18. Air Bag Inflators; Air Bag Modules; Articles, Pyrotechnic; Cartridges, Flash; Cartridges, Signal; Fireworks; Flares, Aerial; Flares, Surface; Seat-Belt Pretensioners; Signal Devices, Hand; Signals, Distress; Signals, Smoke; and Signals, Railway Track, Explosive must be packaged in boxes or drums as follows:

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: paper, plastic	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastics (4H1), and solid plastics (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.19. Cases, Cartridge, Empty with Primer and Cases, Combustible, Empty, without Primer must be packaged in boxes or drums as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Bags: plastic, textile *or* Boxes: fiberboard, plastic, wood *or* Dividing partitions within outer packaging	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.20. Charges, Shaped or Explosive, Commercial must be packaged in boxes as follows. For UN0059, 0439, 0440, and 0441, when shaped charges are packed singly, the conical cavity must face downwards and the package marked "THIS END UP". When shaped charges are packed in pairs, the conical cavities must face inwards. Package as follows:

Inner packaging	Outer packaging
Bags: plastic *or* Boxes: fiberboard *or* Tubes: fiberboard, metal, plastic *or* Dividing partitions within outer packaging	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G)

A5.21. Charges, Shaped, Flexible, Linear must be packaged in boxes or drums as follows:

Inner packaging	Outer packaging
Bags: plastic Note: If ends of articles are sealed, inner packaging is not required.	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2) *or* Drums: removable head steel (1A2) removable head aluminum (1B2), fiber (1G)

A5.22. Cord or Fuse, Detonating; Cord or Fuse, Detonating Mild Effect must be packaged as follows. Seal and tie securely the ends of the detonating cord. Package in boxes or drums as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Bags: plastic *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: paper, plastic *or* Reels Note: Inner packaging is not required for UN0065 and 0289 when securely fastened in coils.	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G)

A5.23. Cord, Igniter; Fuse, Igniter; Fuse, Non-detonating; or Fuse, Safety must be packaged as follows. For UN0101, do not use steel or aluminum packaging and the packaging must be sift-proof unless the fuse is covered by a paper tube and both ends of tube are covered with removable caps. Package in boxes or drums as follows:

Inner packaging	Outer packaging
Bags: plastic *or* Sheets: kraft paper, plastic *or* Reels Note: Inner packaging not required for UN0105 if ends are sealed.	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), fiber (1G)

A5.24. Fuzes, Detonating; Fuzes, Igniting; Grenades; and Grenades, Practice must be packaged in boxes or drums as follows:

Inner packaging	Outer packaging
Receptacles: fiberboard, metal, plastic, wood *or* Trays (individual partitions): plastic wood *or* Dividing partitions in the outer packaging	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.25. Igniters or Lighters, Fuse must be packaged in boxes or drums as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Bags: paper, plastic *or* Receptacles: fiberboard, metal, plastic, wood *or* Sheets: paper *or* Trays (individual partitions): plastic	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.26. Charges, Propelling must be packaged as follows. Ensure metal packagings are constructed so that risk of explosion, by reason of increase in internal pressure (from internal or external causes), is prevented.

A5.26.1. Package in boxes or drums as follows:

Inner packaging	Outer packaging
Bags: kraft paper, plastic, textile, rubberized textile *or* Receptacles: fiberboard, metal, plastic *or* Trays (individual partitions): plastic, wood	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2) *or* Drums: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G)

A5.26.2. Package in composite packaging as follows:

Inner packaging	Outer packaging
Inner packaging not required with use of 6HH2 package.	Plastic receptacle with outer solid box (6HH2)

A5.27. Contrivances, Water-Activated must be packaged as follows:

A5.27.1. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: fiberboard, metal, plastic *or* Dividing partitions in the outer packaging	Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), plywood (4D), reconstituted wood (4F), expanded plastic (4H1). Wooden boxes 4C1, 4D and 4F must contain a metal liner. Seal packagings against the ingress of water.

A5.27.2. Large and Robust Articles must be packaged as follows. Large and robust articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked provided that a negative result was obtained in Test Series 4 of the UN Manual of Tests and Criteria on an unpackaged article. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of transport. Such articles

will be in DOD-approved containers, crates, cradles, or other suitable handling, storage, or launching devices which have been tested to show that they will not become loose during normal conditions of transport. Must contain at least two independent features which prevent the ingress of water.

Attachment 6

CLASS 2-COMPRESSED GASES

A6.1. General Requirements. For military members, failure to obey the mandatory provisions from **paragraphs A6.2** through **A6.25** and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from **paragraph A6.2** through **A6.25** and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from provisions provided and comply with cylinder selection and packaging paragraph requirements. Not all packaging paragraphs are inclusive and packaging selection is based on the type of flammable, nonflammable or toxic gas category as stated in each packaging paragraph or compressed gas Table. This attachment contains information concerning the packaging and general handling instructions for Class 2.1 (flammable gas), Class 2.2 (nonflammable, nontoxic compressed gas), and Class 2.3 (toxic gas). See **Attachment 3** for additional information concerning Class 2 material.

A6.2. Aerosols. Prepare aerosols meeting the definition of "Consumer Commodity" as authorized under **paragraph A13.3**. Aerosol products identified under the proper shipping name "Aerosols" must be packaged as follows:

A6.2.1. Aerosols Containing Non-Toxic Substances. For an aerosol containing non-toxic substances, pack in inner non-refillable non-metal receptacles not exceeding 120 mL (4 fluid-ounce) capacity each, or in inner non-refillable metal or plastic receptacles not exceeding 1 L (34 fluid-ounces) provided all of the following conditions are met:

A6.2.1.1. Pressure in the aerosol container must not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55 degrees C (130 degrees F).

A6.2.1.2. If the pressure exceeds 970 kPa at 55 degrees C (140 psig at 130 degrees F) but does not exceed 1105 kPa at 55 degrees C (160 psig at 130 degrees F) use a DOT 2P, IP7, IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1105 kPa at 55 degrees C (160 psig at 130 degrees F) but does not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) use a DOT 2Q, IP7A, or IP7B inner metal receptacle.

A6.2.1.3. Liquid content of the material and the gas must not completely fill the receptacle at 55 degrees C (130 degrees F).

A6.2.1.4. Each aerosol exceeding 120 mL (4 fluid ounce) capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the content at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.2.1.5. Protect the valves by a cap or other suitable means.

A6.2.1.6. Tightly pack aerosols in a strong outer packaging capable of meeting packaging performance test outlined in A19.3.4. UN specification (UN marked)

packaging is not required. The complete package must not exceed 30 kg (66 lbs) gross weight.

A6.2.2. Other Aerosols. For other aerosols (including those containing toxic substances), pack in inner non-refillable non-metal receptacles not exceeding 120 mL (4 fluid ounce) capacity each, or in inner non-refillable metal receptacles not exceeding 1 L (34 fluid ounces) provided all of the following conditions are met:

A6.2.2.1. Pressure in the aerosol container must not exceed 1500 kPa at 55 degrees C (217 psig at 130 degrees F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55 degrees C (130 degrees F).

A6.2.2.2. If the pressure exceeds 970 kPa at 55 degrees C (140 psig at 130 degrees F) but does not exceed 1105 kPa at 55 degrees C (160 psig at 130 degrees F) use a DOT 2P, IP7, IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1105 kPa at 55 degrees C (160 psig at 130 degrees F) but does not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) use a DOT 2Q, IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1245 kPa at 55 degrees C (180 psig at 130 degrees F) but does not exceed 1500 kPa at 55 degrees C (217 psig at 130 degrees F) use an IP7B inner metal receptacle.

A6.2.2.3. Liquid content of the material and the gas must not completely fill the receptacle at 55 degrees C (130 degrees F).

A6.2.2.4. Each aerosol exceeding 120 mL (4 fluid ounce) capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.2.2.5. Protect the valves by a cap or other suitable means.

A6.2.2.6. Tightly pack aerosols in an outer fiberboard (4G), wooden (4C1, 4C2), plywood (4D), reconstituted (4F), or plastic (4H1, 4H2) box. The packaging must meet PG II requirements.

A6.2.3. For an aerosol charged with a non-toxic solution containing a biological product or medical preparation that could be deteriorated by heat and compressed gases (except Class 6.1, PG III material that are poisonous or nonflammable) pack in inner non-refillable metal receptacles provided all of the following conditions are met:

A6.2.3.1. The capacity of each inner receptacle must not exceed 575 mL (20 fluid ounces).

A6.2.3.2. Pressure in the receptacle must not exceed 970 kPa at 55 degrees C (140 psig at 130 degrees F).

A6.2.3.3. The liquid content of the product and gas must not completely fill the receptacle at 55 degrees C.

A6.2.3.4. One aerosol out of each lot of 500 or less, filled for shipment, must be heated until the pressure in the container is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.2.3.5. Protect the valves by a cap or other suitable means.

A6.2.3.6. Package inner receptacles in a strong outer packaging. The outer packaging must be capable of meeting the limited quantity performance standards outlined in **A19.3.4**. UN specification (UN marked) packaging is not required.

A6.2.3.7. The complete package must not exceed 30 kg (66 lbs) gross weight.

A6.2.4. For an aerosol containing a biological product or medical preparation that could be deteriorated by heat and is nonflammable pack in inner non-refillable metal receptacles provided all of the following conditions are met:

A6.2.4.1. The first five subparagraph requirements of **A6.2.3** related to the aerosol receptacles apply.

A6.2.4.2. Tightly pack aerosol containers in an outer fiberboard (4G), wooden (4C1, 4C2), plywood (4D), reconstituted (4F), or plastic (4H1, 4H2) box. The packaging must meet PG II requirements.

A6.3. Small Receptacles Containing Compressed Gas. Small receptacles of compressed gases, other than aerosols or Consumer Commodities, as identified in this paragraph, must be packaged as follows. Unless otherwise specified, UN specification (UN marked) packaging is not required. Each package must not exceed 30 kg (66 lbs) gross weight. For unregulated compressed gases, comply with general handling requirements in A3.3.2.

A6.3.1. Use containers, except lighter refills, of not more than 120 mL (4 fluid ounces, 7.22 cubic inches or less) capacity each. Package inner receptacles in strong outer packaging.

A6.3.2. Use metal containers filled with nonhazardous material not over 90 percent capacity at 21 degrees C (70 degrees F) then charged with a nonflammable, nonliquefied gas. Each container must be tested to three times the gas pressure at 21 degrees C (70 degrees F). When refilled, the container must be retested to three times the gas pressure at 21 degrees C (70 degrees F) provided one of the following conditions are met:

A6.3.2.1. Container is not over 1 L (1 quart) capacity and charged to not more than 1172 kPa at 21 degrees C (170 psig at 70 degrees F).

A6.3.2.2. Container is not over 114L (30 gallon) capacity and charged to not more than 517 kPa at 21 degrees C (75 psig at 70 degrees F).

A6.3.3. Package electronic tubes of not more than 489 mL (30 cubic inch) volume charged with gas to a pressure of not more than 241 kPa (35 psig). Package in strong outer packaging.

A6.3.4. Use inside metal containers of a capacity not over 570.7 mL (35 cubic inches, 19.3 fluid ounces), charged with nonflammable, nonpoisonous or noncorrosive liquefied compressed gas designed for audible fire alarm systems. Pressure in the container must not exceed 482.6 kPa at 21 degrees C (70 psig at 70 degrees F). The completely assembled non-refillable container must be designed and fabricated with a burst pressure of not less than four times its charged pressure at 55 degrees C (130 degrees F.) Each refillable inside container must be designed and fabricated with a burst pressure of not less than four times its charged pressure at 55 degrees C (130 degrees F). The liquid portion of the gas must not completely fill the container at 55 degrees C (130 degrees F).

A6.3.5. Non-pressurized gas samples must be transported when its pressure corresponding to ambient atmospheric pressure in the container is not more than 105 kPa (15.22 psia) absolute.

For Toxic or Toxic and Flammable non-pressurized gases pack in a hermetically sealed glass or metal inner packagings of not more than 1 L (0.3 gallons) and overpacked in strong outer packaging. For flammable non-pressurized gases pack in hermetically sealed glass or metal inner packagings of not more than 5L (1.3 gallons) and overpacked in strong outer packaging.

A6.3.6. A cylinder that is a component part of a passenger restraint system and is installed in a motor vehicle, charged with nonliquefied, nonflammable compressed gas and having no more than two actuating cartridges per valve, is exempt from the requirements of this manual with the following exceptions:

A6.3.6.1. Cylinder must comply with one of the cylinder specifications in 49 CFR Part 178, and be authorized for use in A6.6. for the gas it contains.

A6.3.6.2. Cylinder must comply with the filling requirements of A3.3.2.6.

A6.3.7. A cylinder that is part of a tire inflation system in a motor vehicle, charged with a nonliquefied, nonflammable compressed gas, and is excepted from the requirements of this manual except the following:

A6.3.7.1. Cylinder must comply with one of the cylinder specifications in 49 CFR Part 178, and be authorized for use in **Table A6.1** for the gas it contains.

A6.3.7.2. Cylinder must comply with the filling requirements of A3.3.2.6.

A6.3.7.3. Each cylinder must be securely installed in the trunk of the motor vehicle, and the valve must be protected against accidental discharge.

A6.4. Liquefied Compressed Gases. Liquefied compressed gases must be packaged as follows:

A6.4.1. Ship liquefied compressed gases, including nontoxic and nonflammable mixtures, in accordance with the filling, pressure, and DOT cylinder specification requirements of **Table A6.1**. If the compressed gas is not specifically identified in **Table A6.1**, ship (except gas in solution) in DOT 3, 3A, 3AL, 3AA, 3B, 3BN, 3D, 3E, 4, 4A, 4B, 4BA, 4B240ET, 4BW, 4E, 9, 25, 26, 38, 39, 40, or 41 cylinders. Ensure compliance with general handling requirements in A3.1.7.2. Do not charge and ship DOT 4E, 9, 39, 40, or 41 cylinders with a mixture containing a pyrophoric liquid, carbon bisulfide (disulfide), ethyl chloride, ethylene oxide, nickel carbonyl, spirits of nitroglycerin, or toxic material, (Class 6.1 or 2.3) unless authorized in a specific packaging paragraph. Use of existing cylinders, DOT 3, 3D, 4, 4A, 9, 25, 26, 38, 40, and 41 is authorized, but new construction of these cylinders is not authorized.

A6.4.2. DOT 3AL Cylinders. Use DOT 3AL cylinders to ship Carbonyl sulfide, cyclobutane, dimethyl ether, hydrogen selenide, propylene, silane, and vinyl bromide. Shipments are authorized on cargo aircraft only. In addition, DOT 3AL cylinders must not be used for any material with a primary or subsidiary hazard of Class 8.

A6.4.3. Mixtures With Class 2.3. Ship a mixture containing any Class 2.3 material or irritating material, in such proportion that the mixture would be classed as toxic, in containers authorized for these poisonous materials.

A6.4.4. Ship carbon dioxide and oxygen mixture, compressed; liquefied gas, oxidizing, n.o.s.; or nitrous oxide in DOT-3A, 3AA, 3AL, 3E, 3HT, 39 cylinders, UN pressure

receptacles ISO 9809-1, ISO 9802-2, ISO 9809-3 and ISO 7866 cylinders in rigid outer packaging in accordance with 49 CFR §173.304(f).

A6.4.5. Carbon Dioxide, Refrigerated Liquid or Nitrous Oxide, Refrigerated Liquid. Ship in DOT 4AL cylinders in accordance with 49 CFR §173.304a(e).

A6.4.6. Refrigerant Gases. Ship refrigerant gases that are nonpoisonous and nonflammable in cylinders prescribed in A6.4.1. or as follows: In DOT 2P and 2Q containers must be packed in a strong wooden or fiberboard boxes designed to protect valves from damage or accidental functioning under conditions incident to transportation. Pressure in the container must not exceed 599 kPa at 21 degrees C (87 psia at 70 degrees F). Each completed metal container filled for shipment must be heated until contents reach a minimum temperature of 54 degrees C (130 degrees F), without evidence of leakage, distortion, or other defects.

A6.4.7. Engine Starting Fluid. Engine-starting fluids containing compressed gas (or gases) that are flammable in cylinders prescribed in A6.4.1. or as follows:

A6.4.7.1. Inside nonrefillable metal containers not over 500 mL (32 cubic inch) capacity. Pressure in the container must not exceed 999 kPa at 54 degrees C (145 psia at 130 degrees F).

A6.4.7.2. If the pressure exceeds 999 kPa at 54 degrees C (145 psia at 130 degrees F) use a DOT 2P container.

A6.4.7.3. Any metal container must be capable of withstanding a pressure of 1 1/2 times the pressure of the content at 54 degrees C (130 degrees F) without bursting.

A6.4.7.4. The liquid content of the material and gas must not completely fill the container at 54 degrees C (130 degrees F). Each container filled for shipment must have been heated until the contents reach a minimum temperature of 54 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.4.7.5. Pack inside nonrefillable metal containers in a strong tight outer packaging.

A6.4.8. Foreign Cylinders. Foreign cylinders meeting the requirements of A3.3.2.10.

A6.4.9. UN Specification cylinders meeting the requirements of 49 CFR §173.304b and marked with "USA" as country of approval.

A6.5. Nonliquefied Compressed Gases. Nonliquefied compressed gases must be packaged as follows:

A6.5.1. Ship nonliquefied, compressed gases in accordance with the filling, pressure, and DOT cylinder specification requirements of **Table A6.1**. If the compressed gas is not specifically identified in **Table A6.1**, ship in DOT 3, 3A, 3AA, 3AL, 3B, 3E, 4B, 4BA, or 4BW. Use of existing cylinders, DOT 3, 3C, 3D, 4, 4A, 4C, 25, 26, 33, and 38 is authorized, but new construction of these cylinders is not authorized.

A6.5.2. DOT-3HT Cylinders. DOT-3HT cylinders for use in aircraft only, having a maximum service life of 24 years, are only authorized for nonflammable gases. They must be equipped with a frangible disc safety relief device, without fusible metal backing, with a rated bursting pressure not over 90 percent of the minimum required test pressure of the cylinder with which the device is used. Pack cylinders in strong outer packagings.

A6.5.3. DOT 39 Cylinder. Use DOT 39 cylinder for compressed gasses. When used for flammable gases, the internal volume must not exceed 1.23 L (75 cubic inches). Use aluminum cylinders for oxygen only under the following conditions:

A6.5.3.1. Cylinder threads must be straight threads (except for UN Cylinders).

A6.5.3.2. Valves must be made of brass or stainless steel.

A6.5.3.3. Each cylinder must be cleaned to comply with the requirements of DLAI 4145.25 or MIL-STD-1411, *Inspection and Maintenance of Compressed Gas Cylinders*.

A6.5.3.4. The pressure in each cylinder must not exceed 20,684 kPa (3000 psig) at 21 degrees C (70 degrees F).

A6.5.4. DOT 3AL Cylinder. Use DOT 3AL cylinder only for the following nonliquefied gases: air, argon, carbon monoxide, ethylene, helium, mercury free hydrogen, krypton, methane, nitrogen, neon, oxygen, and xenon. Ship flammable gases in 3AL cylinders on cargo aircraft only. When used in oxygen service, the cylinders must comply with 49 CFR §173.302a(a)(5).

A6.5.5. DOT 3AX, 3AAX, 3T Cylinders. Use cylinders, DOT 3AX, 3AAX, or 3T for Division 2.1 and 2.2 materials and for carbon monoxide. DOT 3T cylinders are not authorized for hydrogen. When used in methane service, the methane must be a nonliquefied gas with a minimum purity of 98.0 percent methane and which is commercially free of corroding components.

A6.5.6. UN Specification cylinders marked with "USA" as country of approval. UN cylinders must comply with the requirements of 49 CFR §173.302b.

A6.5.7. Foreign Cylinders. Foreign cylinders meeting the requirements of A3.3.2.10.

A6.5.8. Compressed Oxygen and Oxidizing Gases. A cylinder containing compressed oxygen, compressed oxidizing gases, or nitrogen trifluoride must be packaged in a rigid outer packaging that conforms to the requirements of either 49 CFR Part 178, Subparts L and M, at the Packing Group I or II performance level; or the performance criteria in Air Transport Association (ATA) Specification No. 300 for a Category I Shipping Container. In addition, is capable of meeting the following additional requirements:

A6.5.8.1. Pass the Flame Penetration Resistance Test specified in 49 CFR Part 178, Appendix E.

A6.5.8.2. Pass the Thermal Resistance Test specified in 49 CFR Part 178, Appendix D.

A6.5.8.3. Prior to each shipment, passes a visual inspection that verifies that all features of the packaging are in good condition, including all latches, hinges, seams, and other features, and that the packaging is free from perforations, cracks, dents, or other abrasions that may negatively affect the flame penetration resistance and thermal resistance characteristics of the packaging.

A6.5.9. Carbon Monoxide. Ship carbon monoxide in a DOT-3A, 3AX, 3AA, 3AAX, 3AL, 3, 3E, or 3T cylinder having a minimum service pressure of 12,411 kPa (1800 psig). The pressure in the cylinder must not exceed 6895 kPa at 21 degrees C (1000 psig at 70 degrees F), except that if the gas is dry and sulfur free, charge the cylinder to no more than five-sixths

of the cylinder service pressure or 13,790 kPa (2000 psig), whichever is the least. Fill DOT 3AL cylinders to no more than its marked service pressure.

A6.5.10. Fluorine. For fluorine gas use only DOT 3A1000, 3AA1000, or 3BN400 cylinders without a safety relief device and equipped with valve protection caps. Do not charge cylinders over 2758 kPa at 21 degrees C (400 psig at 70 degrees F) and ensure contents do not exceed 2.7 kg (6 pounds) of gas.

A6.5.11. Liquid Argon, Oxygen, and Nitrogen Samples. Ship liquid argon, oxygen, or nitrogen samples under pressure, in Cosmodyne Gas Samplers, Models CS 4.4 and CS 2.0 or in TTU-131/E Sampler (MIL-S-27626). See applicable technical directive for overpack instructions. Take samples in the liquid state but vaporize before shipment.

A6.5.12. Diborane and Diborane Mixtures. For Diborane and Diborane mixtures, use only a DOT 3AL or 3AA cylinders having a minimum service pressure of 12,411 kPa (1800 psig). The maximum filling density of the diborane will not exceed 7 percent. Diborane mixed with compatible compressed gas will not have a pressure exceeding the service pressure of the cylinder if complete decomposition of the diborane occurs.

A6.5.13. Recoil Mechanisms/Artillery Gun Mounts. Pack recoil mechanisms or artillery gun mounts containing nitrogen charged to a maximum pressure of 15,858 kPa at 21 degrees C (2300 psig at 70 degrees F) in strong outer wooden containers. Ship recoil mechanisms or artillery gun mounts containing nitrogen unpackaged when securely attached to the weapon system.

A6.5.14. Satellites, Spacecraft, and Other Articles Charged with Nitrogen or Dry Air. These items may be transported inside a protective shipping container with a nitrogen or air purge during flight. The compressed gas must be in authorized cylinders and protected from damage during transport. The system must be equipped with a safety valve, enabling the nitrogen flow to be immediately shut off in the event of a problem while on the aircraft. Transport authorized on C-5, and C-17 aircraft only. The following limitations apply:

A6.5.14.1. Nitrogen may be purged into the shipping container at a rate not to exceed five (5) cubic feet per hour.

A6.5.14.2. Nitrogen may be purged into the shipping container at a rate not to exceed twenty (20) cubic feet per hour during transport. A technical escort must, using a portable oxygen monitor, continuously check the atmosphere inside the aircraft during flight. If the percentage of oxygen drops to 19.5% per volume, the escort must notify the aircraft commander immediately and the nitrogen purge immediately discontinued. All personnel will use supplemental oxygen until the percentage of oxygen exceeds 19.5% per volume. Provide maximum airflow rate in the cargo compartment during flight. Cargo doors must remain open during ground operations to provide adequate ventilation.

A6.5.14.3. Dry air may be purged into the shipping container at a rate not to exceed 70 cubic feet per hour.

A6.5.14.4. All other requirements of this manual must be met.

A6.5.14.5. See **Attachment 17** for additional certification requirements.

Table A6.1. Cylinder Requirements for Compressed Gases.

Table A6.1 Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.6)	Cylinders Marked as Shown Below Must be Used
Anhydrous ammonia	54	DOT-3A480, DOT-3AA480, DOT3A480X, DOT-4AA480, DOT-3E, DOT-3E1800, DOT-3AL480
Bromotrifluoromethane (R-13B1 or H-1301)	124	DOT-3A400, DOT-3AA400, DOT-3B400, DOT-4AA480, DOT-4B400, DOT-4BA400, DOT-4BW400, DOT-3E1800, DOT-39, DOT-3AL400
Carbon dioxide (see notes 3 and 4)	68	DOT-3A1800, DOT-3AX1800, DOT-3AA1800, DOT-3AAX1800, DOT-3, DOT-3E1800, DOT-3T1800, DOT-3HT2000, DOT-39, DOT-3AL1800,
Carbon dioxide refrigerated liquid		DOT-4L
Chlorine (see note 1)	125	DOT-3A480, DOT-3AA480, DOT-3, DOT-3BN480, DOT-3E1800, DOT-25
Chlorodifluroethane (R142b) or 1-Chloro-1, 1-Difluoroethane (see note 4)	100	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-4BW225, DOT-3E1800, DOT-39, DOT-3AL150,
Chlorodifluoromethane (R22) (see note 4)	105	DOT-3A240, DOT-3AA240, DOT-3B240, DOT-4B240, DOT-4BA240, DOT-4BW240, DOT-4B240ET, DOT-4E240, DOT-39, DOT-41, DOT-3E1800, DOT-3ALA240,
Chloropentafluorethane (R-115)	110	DOT-3A225, DOT-3AA225, DOT-3B225, DOT4A225, DOT-4BA225, DOT-4B225, DOT-4BW225, DOT-3E1800, DOT-39, DOT-3AL225,

Chlorotrifluoromethane (R-13) (see note 4)	100	DOT-3A1800, DOT-3AA1800, DOT-3, DOT-3E1800, DOT-39, DOT-3AL1800
Cyclopropane (see note 4)	55	DOT-3A225, DOT-3A480X, DOT-3AA225, DOT-3B225, DOT4A225, DOT-4AA480, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-3, DOT-3E1800, DOT-39, DOT-3AL225
Dichlorodifluoromethane (R-12) (see note 4)	119	DOT-3A225, DOT-3AA225, DOT-3B225, DOT4A225, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-4E225, DOT 9, DOT-39, DOT-41, DOT-3E1800, DOT-3AL225
Dichlorodifluoromethane and difluoroethane mixture (constant boiling mixture) (R-500) (see note 4)	Not liquid full at 55 degrees C (131 degrees F)	DOT-3A240, DOT-3AA240, DOT-3B240, DOT-3E1800, DOT4A240, DOT-4B240, DOT-4BA240, DOT-4BW240, DOT-4E240, DOT-9, DOT-39
Difluoroethane (R-152a) (see note 4)	79	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-4BW225, DOT-3E1800, DOT-3AL150
1,1-Difluoroethylene (R-1132A)	73	DOT-3A2200, DOT-3AA2200, DOT-3AX2200, DOT-3AAX2200, DOT-3T2200, DOT-39
Dimethylamine, anhydrous	59	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-4BW225, ICC-3E1800

Ethane (see note 4)	35.8	DOT-3A1800, DOT-3AX1800, DOT-3AA1800, DOT-3AAX1800, DOT-3, DOT 3E1800, DOT-3T1800, DOT-39, DOT-3AL1800
Ethane (see note 4)	36.8	DOT-3A2000, DOT-3AX2000, DOT-3AA2000, DOT-3AAX2000, DOT-3T2000, DOT-39, DOT-3AL2000
Ethylene (see note 4)	31.0	DOT-3A1800, DOT-3AX1800, DOT-3AA1800, DOT-3AAX1800, DOT -3, DOT-3E1800, DOT-3T1800, DOT-39, DOT-3AL1800
Ethylene (see note 4)	32.5	DOT-3A2000, DOT-3AX2000, DOT-3AA2000, DOT-3AAX2000, DOT-3T2000, DOT-39, DOT-3AL2000
Ethylene (see notes 4)	35.5	DOT-3A2400, DOT-3AX2400, DOT-3AA2400, DOT-3AAX2400, DOT-3T2400, DOT-39, DOT-3AL2400
Hydrogen chloride, anhydrous	65	DOT-3A1800, DOT-3AA1800, DOT-3AX1800, DOT-3AAX1800, DOT-3, DOT-3T1800, DOT-3E1800
Hydrogen sulfide (see notes 5 and 6)	62.5	DOT-3A, DOT-3AA, DOT-3B, DOT-4A, DOT-4B, DOT-4BA, DOT-4BW, DOT-3E1800, DOT-3AL

Insecticide, gases liquefied (see note 4 and 8)	Not liquid full at 55 degrees C (131 degrees F)	DOT-3A300, DOT-3AA300, DOT-3B300, DOT-4B300, DOT-4BA300, DOT-4BW300, DOT-3E1800, DOT 9, DOT40, DOT-41
Liquefied nonflammable gases, other than classified flammable, corrosive, toxic & mixtures or solution thereof filled with nitrogen, carbon dioxide or air (see notes 3 and 4)	Not liquid full at 55 degrees C (131 degrees F)	DOT specification cylinders identified in A6.4.1. and DOT-3HT, DOT-4D, DOT-4DA, DOT-4DS
Methylacetylene-propadiene, mixtures, stabilized (see note 2)	Not liquid full at 55 degrees C (131 degrees F)	DOT-4B240, without brazed seams, DOT-4BA240, without brazed seams, DOT-3A240, DOT-3AA240, DOT-3B240, DOT-3E1800, DOT-4, DOT-4BW240, DOT-4E240, DOT-4B240ET, DOT-3AL240, DOT-41
Methyl chloride	84	DOT-3A225, DOT-3AA225, DOT-3B225, DOT4, DOT4A225, DOT-4B225, DOT-4BA225,DOT-4BW225 , DOT-3, DOT-3E1800, DOT-4B240ET, DOT-25, DOT-26-300, DOT-38, DOT-4A150, Cylinders complying with DOT-3A150, 3B150, and 4B150 manufactured before 7 December 1936 are also authorized.
Methyl mercaptan	80	DOT-3A240, DOT-3AA240, DOT-3B240, DOT-4B240, DOT-4B240ET, DOT-3E1800, DOT-4BA240, DOT-4BW240
Nitrosyl Chloride	110	DOT-3BN400 only

Nitrous Oxide (see notes 3, 4, and 7)	68	DOT-3A1800, DOT-3AA1800, DOT-3AX1800, DOT-3AAX1800, DOT-3, DOT-3E1800, DOT-3T1800, DOT-3HT2000, DOT-39, DOT-3AL1800
Refrigerant gas, n.o.s or Dispersant gas, n.o.s. (see notes 4 and 9)	Not liquid full at 55 degrees C (131 degrees F)	DOT-3A240, DOT-3AA240, DOT-3B240, DOT-3E1800, DOT4A-240, DOT-4B240, DOT-4BA240, DOT-4BW240, DOT-4E240, DOT-39, DOT-3AL240
Sulfur dioxide (see note 4)	125	DOT-3A225, DOT-3AA225, DOT-3B225, DOT-4, DOT4A225, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-3, DOT-25, DOT26-150, DOT-38, DOT-39, DOT-3E1800, DOT-3AL225
Sulfur hexafluoride	120	DOT-3A1000, DOT- 3AA1000, DOT-3AAX2400, DOT-3, DOT-3AL1000, DOT-3E1800, DOT-3T1800
Sulfuryl fluoride	106	DOT-3A480, DOT-3AA480, DOT-3E1800, DOT-4B480, DOT-4BA480, DOT-4BW480
Tetrafluoroethylene, stabilized	90	DOT-3A1200, DOT-3AA1200, DOT-3E1800
Trifluorochloroethylene	115	DOT-3A300, DOT-3AA300, DOT-3B300, DOT-4A-300, DOT-4B300, DOT-4BA300, DOT-4BW300, DOT-3E1800
Trimethylamine, anhydrous	57	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-4BW225, DOT-3E1800

Vinyl chloride (see note 2)	84	DOT-4B150 without brazed seams, DOT-4BA225 without brazed seams, DOT-4BW225, DOT-3A150, DOT- 3AA150, DOT-3E1800, DOT-3AL150, DOT-25
Vinyl fluoride, stabilized	62	DOT-3A1800, DOT-3AA1800, DOT-3E1800, DOT-3AL1800
Vinyl methyl ether (see note 2)	68	DOT-4B150 without brazed seams, DOT-4BA225 without brazed seams, DOT-4BW225, DOT-3A150, DOT-3AA150, DOT3B150, DOT-3B1800, DOT 3E1800, DOT-25

NOTES:

1. Cylinders purchased after 1 October 1944 for the transportation of chlorine must contain no aperture other than that provided in the neck of the cylinder for attachment of a valve equipped with an approved safety device. Cylinders purchased after November 1, 1935 and charged with chlorine must not contain over 150 pounds of gas.

2. All parts of valve and safety devices in contact with contents of cylinders must be of a metal or other material, suitably treated if necessary, which will not cause formation of any acetylides.

3. DOT-3HT cylinders are authorized for use in aircraft only for a maximum service life of 24 years. They must be equipped with a frangible disc safety relief device, without fusible metal backing, and with a rated bursting pressure not over 9 percent of the minimum required test pressure of the cylinder with which the device is used. Ship only nonflammable gases in these cylinders and pack in strong outer packagings.

4. Refer to A3.3.2.7. for additional packaging requirements, if applicable.

5. Use of a DOT specification cylinder with a service pressure of 480 psi is not authorized.

6. Ensure each valve outlet is sealed by a threaded cap or a threaded solid plug.

7. Ensure DOT-3AL cylinders are equipped with brass or stainless steel valves and cleaned in compliance with Federal Specification RR-C-901c.

8. See A6.4.1. and A6.4.6. (Only DOT 2P is authorized).

9. See A6.4.6.

A6.6. Liquefied Petroleum Gas (see A3.3.2. for additional cylinder and filling requirements). Liquefied petroleum gas must be packaged as follows:

A6.6.1. Use DOT 3, 3A, 3AA, 3AL, 3B, 3E, 4B, 4BA, 4B240ET, 4BW, 4E, or 39, cylinders. Ensure the internal volume of DOT 39 cylinders is not over 1.23 L (75 cubic inches). Comply with the requirements of **Table A6.1** for the gases named.

A6.6.2. DOT 2P or 2Q Containers. Use DOT 2P or 2Q containers, packed in strong wooden or fiberboard boxes designed to protect valves from damage or accidental functioning under normal transportation conditions. Each completed container filled for shipment must have been heated until contents reached a minimum temperature of 54 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects. DOT 2P or 2Q containers with a maximum capacity of 31.83 cubic inches are authorized under the following conditions:

A6.6.2.1. Maximum filling pressure of 310.3 kPa (45 psig) at 21 degrees C (70 degrees F), and 724 kPa (105 psig) at 54 degrees C (130 degrees F) when equipped with safety devices which will prevent rupture of the container and dangerous projection of a closing device when it is exposed to fire.

A6.6.2.2. Maximum filling pressure of 241 kPa (35 psig) at 21 degrees C (70 degrees F) and 689.5 kPa (100 psig) at 54 degrees C (130 degrees F).

A6.6.3. Foreign Cylinders. Foreign cylinders meeting the requirements of A3.3.2.10.

A6.6.4. UN Specification cylinders marked with "USA" as country of approval.

A6.7. Fire Extinguishers. Fire extinguishers authorized below may be shipped secured in holders as part of a vehicle/equipment according to A3.3.2.13. If these fire extinguishers are not fastened in a designed holder, they must be packed in strong outer containers. Ship fire extinguishers in DOT specification cylinders identified in **paragraphs A6.7.1** and **A6.7.2**. Ship fire extinguishers in non-DOT specification cylinders as identified in **paragraphs A6.7.3** and **A6.7.4**. Fire suppression bottles in DOT specification 3HT, 4D, 4DA, or 4DS, use description “Liquefied Gases, UN1058”; “Compressed Gas, N.O.S., UN1956”; or the hazard classification assigned by the manufacturer. See **paragraph A6.4.1** and **Table A6.1**.

A6.7.1. DOT 3A, 3AA, 3AL, 3E, 4B, 4BA, 4B240ET, or 4BW Cylinders. Use these cylinders provided:

A6.7.1.1. Cylinders contain only fire extinguishing agents such as ammonium phosphate, sodium bicarbonate, potassium bicarbonate, potassium imido dicarboxamide and bromochlorodifluromethane or bromotriflouromethane, which is commercially free from corroding components.

A6.7.1.2. Cylinders are charged with a nonflammable, nontoxic, noncorrosive, dry gas, having a dew point at or below minus 46.7 degrees C (minus 52 degrees F) at 101 kPa (1 atmosphere), to not more than the service pressure of the cylinder.

A6.7.1.3. Cylinders have an external corrosion-resistant coating.

A6.7.1.4. Cylinders are retested in accordance with Title 49 CFR §178.209(j).

A6.7.1.5. Fire extinguisher, DOT 4BW240, on a cart does not require additional packaging.

A6.7.2. DOT 2P or 2Q Containers. Use DOT 2P or 2Q inner nonrefillable metal containers provided:

A6.7.2.1. The liquid portion of the gas plus any additional liquid or solid does not completely fill the container at 55 degrees C (130 degrees F).

A6.7.2.2. The pressure in the container does not exceed 1250 kPa (181 psig) at 55 degrees C (130 degrees F). If the pressure exceeds 920 kPa (141 psig) at 55 degrees C (130 degrees F), but does not exceed 1100 kPa (160 psig) at 55 degrees C (130 degrees F), use a DOT 2P inner metal container. If the pressure exceeds 1100 kPa (160 psig) at 55 degrees C (130 degrees F) use a DOT 2Q inner metal container. The metal container must be capable of withstanding, without bursting, a pressure of one and one-half times the equilibrium pressure of the contents at 55 degrees C (130 degrees F).

A6.7.2.3. Each completed inner container filled for shipment must have been heated until the pressure in the container is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defect.

A6.7.3. Fire Extinguishers with a Small Amount of Compressed Gas. Must not contain more than 1660 kPa at 21 degrees C (241 psig at 70 degrees F). Fire extinguishers marked “MEETS DOT REQUIREMENTS” are excepted from DOT cylinder specification requirements provided:

A6.7.3.1. They are shipped as inside containers. Use original manufacturer’s packaging or suitable outer packaging to protect extinguisher during normal transportation.

A6.7.3.2. The contents are not flammable, toxic, or corrosive.

A6.7.3.3. Internal volume is not over 18 L (1,100 cubic inches). For fire extinguishers not over 900 mL (55 cubic inch) capacity, the liquid portion of the gas plus any additional liquid or solid must not completely fill the container at 55 degrees C (130 degrees F). Fire extinguishers over 900 mL (35 cubic inches) must not contain liquefied compressed gas.

A6.7.3.4. Fire extinguishers manufactured on and after 1 January 1976 must be designed and fabricated with a burst pressure not less than six times its charged pressure at 21 degrees C (70 degrees F).

A6.7.3.5. Fire extinguishers are tested to three times the charged pressure at 21 degrees C (70 degrees F), but not less than 825 kPa (120 psig) without failure before the initial shipment. For any subsequent shipments, they must meet retest requirements of 29 CFR §1910.157(e).

A6.7.4. FEU-1/M Extinguisher. Transport extinguisher (FEU-1/M) 37.8 L (10 gallon) capacity on military aircraft without special packing and crating. Use caution during handling and transportation to avoid damage to valves.

A6.7.5. Foreign Fire Extinguishers. Foreign fire extinguishers must meet the requirements of A3.3.2.10.

A6.7.6. UN Specification cylinders marked with "USA" as country of approval.

A6.8. Refrigerating Machines, Air Conditioners, and Articles, Pressurized Hydraulic or Pneumatic must be packaged as follows:

A6.8.1. Refrigerating Machines, Air Conditioners, and Components. Factory-tested refrigerating machines, air conditioners, and components are exempted from specification

packaging, marking, and labeling except for the name of contents on the outer packaging, provided (see A3.3.2.9. for small quantities):

A6.8.1.1. Each pressure vessel is charged to not more than 2268 kg (5,000 pounds) of Group A1 refrigerant as classified in ANSI/ASHRAE Standard 15, or not more than 22.7 kg (50 pounds) of refrigerant other than Group A1.

A6.8.1.2. Machines containing two or more charged vessels must not contain more than 907 kg (2,000 pounds) of Group 1 refrigerant, or more than 45.4 kg (100 pounds) of refrigerant other than Group 1.

A6.8.1.3. Each pressure vessel is equipped with a safety relief device meeting the requirements of ANSI/ASHRAE Standard 15.

A6.8.1.4. Each pressure vessel is equipped with an individual shut-off valve at each opening except openings used for safety devices and with no other connection. Close shut-off valves during transportation.

A6.8.1.5. Pressure vessels are manufactured, inspected, and tested according to ANSI/ASHRAE Standard 15, or when over 152.4 mm (6 inches) internal diameter, according to American Society of Mechanical Engineers (ASME) Code.

A6.8.1.6. All parts subject to refrigerant pressure during shipment are tested under ANSI/ ASHRAE Standard 15.

A6.8.1.7. The liquid portion of refrigerant, if any, does not completely fill any pressure vessel at 55 degrees C (130 degrees F).

A6.8.1.8. Filling densities prescribed in A3.3.2.6. are not exceeded.

A6.8.2. Articles, Pressurized Hydraulic or Pneumatic. The following apply to Articles, Pressurized, Hydraulic or Pneumatic (e.g., accumulators) containing nonliquefied, nonflammable gas, and nonflammable liquids or pneumatic accumulators containing nonliquefied, nonflammable gas, fabricated from materials that do not fragment upon rupture:

A6.8.2.1. Accumulators installed in motor vehicles, construction equipment, and assembled machinery, designed and fabricated with a burst pressure of not less than five times their charged pressure at 21 degrees C (70 degrees F) are exempt from the requirements of this manual.

A6.8.2.2. When charged to not more than 1380 kPa (200 psig) at 21 degrees C (70 degrees F), the following conditions apply:

A6.8.2.2.1. Each article must have a fluid space not exceeding 41L (2,500 cubic inches) under stored pressure.

A6.8.2.2.2. Ship each article as an inside package. There are no specification requirements.

A6.8.2.2.3. Each article must be tested, without evidence of failure or damage, to at least three times its charged pressure at 21 degrees C (70 degrees F) but not less than 120 psig (830 kPa) before initial shipment and before each refilling and reshipment.

A6.8.2.3. When charged over 1380 kPa (200 psig) at 21 degrees C (70 degrees F) the following conditions apply:

A6.8.2.3.1. Each article must have a fluid space not exceeding 41L (2,500 cubic inches) under stored pressure.

A6.8.2.3.2. Each article must be tested, without evidence of failure or damage, to at least three times its charged pressure at 21 degrees C (70 degrees F) but not less than 120 psig (830 kPa) before initial shipment and before each refilling and reshipment.

A6.8.2.3.3. Each article must be designed and fabricated with a burst pressure of not less than five times its charged pressure when shipped.

A6.9. Acetylene Gas must be packaged as follows:

A6.9.1. DOT 8 or 8AL Cylinders. Ship in DOT 8 or 8AL cylinders with the following provisions:

A6.9.1.1. Ensure cylinders are filled with a porous material charged with a suitable solvent as identified in 49 CFR §178.59 or §178.60.

A6.9.1.2. The specific gravity of acetone solvent in acetylene cylinders must be 0.796 or over at 15.5 degrees C (60 degrees F). The amount of solvent added in the refilling operation must not cause the tare weight of the cylinder to be over its marked tare weight. The tare weight includes the weight of the cylinder shell, porous filling, safety relief devices, valve, and solvent, but without removable cap.

A6.9.1.3. The pressure in cylinders containing acetylene gas must not exceed 1724 kPa at 21 degrees C (250 psig at 70 degrees F); however, if the cylinders are marked for a lower allowable charging pressure at 21 degrees C (70 degrees F), then do not exceed that pressure.

A6.9.2. Foreign Cylinders. Foreign cylinders must meet the requirements of A3.3.2.6.

A6.9.3. UN Specification cylinders meeting the requirements of 49 CFR §173.303(f) and marked with "USA" as country of approval.

A6.10. Cigarette Lighters or Other Similar Devices Charged With Fuel must be packaged as follows: Do not ship any package containing a cigarette lighter or other similar ignition device charged with fuel and equipped with an ignition element, or any self-lighting cigarette, unless the design of the device and its packaging has been approved according to 2.3. or by the DOT. The DOT approval process is identified in 49 CFR §173.308. Ship a cigarette lighter or other similar device charged with a flammable gas according to the following:

A6.10.1. No more than 10 grams (0.35 fluid ounces) of liquefied gas may be loaded into each device.

A6.10.2. The liquid portion of the gas must not be over 85 percent of the volumetric capacity of each chamber at 15 degrees C (59 degrees F).

A6.10.3. Each device including closures must be capable of withstanding, without leakage or rupture, an internal pressure of at least two times the vapor pressure of the fuel at 55 degrees C (130 degrees F).

A6.10.4. Lighters must be placed in an inner packaging that is designed to prevent movement of the lighters and inadvertent ignition or leakage. The ignition device and gas control lever of each lighter must be designed, or securely sealed, taped, or otherwise fastened or packaged to protect against accidental functioning or leakage of the contents during transport. If lighters are packed vertically in a plastic tray, a plastic, fiberboard or paperboard partition must be used to prevent friction between the ignition device and the inner packaging.

A6.10.5. Lighters and their inner packagings must be tightly packed and secured against movement in any rigid non-bulk UN specification outer packaging authorized in 49 CFR Part 178 at the Packing Group II performance level.

A6.10.6. Lighter refills must not contain an ignition element but must contain a release device. Lighter refills must not exceed 4 fluid ounces capacity (7.22 cubic inches) or contain more than 65 grams of a Division 2.1 fuel. Lighter refills must be tightly packed and secured against movement in any rigid non-bulk UN specification outer packaging authorized in 49 CFR Part 178 at the Packing Group II performance level.

A6.11. Cryogenic Liquids must be packaged as follows:

A6.11.1. Handling Instructions. Store in cool, well-ventilated area away from fire hazards, direct rays of the sun, and organic or easily oxidizable materials such as grease and oil. Handle containers with extreme care. Avoid direct contact.

A6.11.2. Packaging Requirements. Ensure all containers are prepared IAW T.O. 37C2-8-1-127 and designed to hold low temperature liquefied gases and are strong enough to withstand all shocks and loading normally incident to air shipment and associated handling. Ship cryogenic liquids of argon, helium, neon, nitrogen, and oxygen according to filling density requirements in **Figure A3.4**. Ship hydrogen (minimum 95 percent parahydrogen) according to filling density requirements in **Figure A3.5**. Unless excepted in this paragraph, connect container to the aircraft's overboard vent system as required by A3.3.2.16.2. Protect container accessories against damage in handling.

A6.11.2.1. DOT 4L cylinders in a vertical position.

A6.11.2.2. Type TMU-27M, MIL-T-38170, or MA-1, trailer mounted, 189 L (50 gallon) capacity containers.

A6.11.2.3. C-1, 1892 L (500 gallons) capacity containers.

A6.11.2.4. Dewars, 25 L (6.6 gallon) capacity each. Not more than 6 per aircraft.

A6.11.2.5. Nonpressurized metal vacuum-type containers, dewars, 100 liter (26.42 gallon capacity) attached to nonskid base. Ship no more than one container per aircraft.

A6.11.2.6. NRU-5/E air-transportable 1514L (400 gallon tank) (MIL-T-38261).

A6.11.2.7. LS-160 container attached to shipping platform. Ship a maximum of one container per aircraft. Maximum 150 liters (39.63 gallons) nitrogen per container.

A6.11.2.8. TMU-70/M (MIL-A-85415) LOX servicing trailers. The trailers must be equipped with absolute pressure relief valve.

A6.11.2.9. TMU-24E (MIL-T-27720), mounted on aircraft cargo pallet, 1514 L (400 gallons), liquid oxygen or liquid nitrogen storage and transfer tanks.

A6.11.2.10. LSHe-102, 109 L (28.79 gallon) capacity, attached to shipping skid. Container must be equipped with an absolute pressure relief valve for air shipment. Authorized for liquid helium.

A6.11.2.11. LSHe-30, 30 L (7.92 gallon) capacity, packed in a specially designed shipping container (P/N 0305-0002) equipped with plastic foam pads. Ship no more than five containers per aircraft. Authorized for liquid helium and neon.

A6.11.2.12. LSNe-75, liquid neon container, with a maximum quantity of 75 L (19.81 gallon) attached to a shipping skid. Ship not more than two containers per aircraft. Containers must be equipped with an absolute pressure relief valve.

A6.11.2.13. Liquid oxygen and liquid nitrogen in specification MIL-T-38170 containers vented to the outside of the aircraft. The container vent valve must be monitored by a crewmember to make sure the pressure buildup within the container is not over 40 psig. The container must be vented down to 5 psig whenever necessary during flight and the valve again shut off.

A6.11.2.14. CRU-87/U, 10-liter, Portable Therapeutic Liquid Oxygen (PTLOX) Converters. Up to 25 PTLOX converters per aircraft may be shipped without overboard venting, except that C-21 aircraft is limited to 10 PTLOX converters without overboard venting.

A6.11.2.15. Foreign cylinders meeting the requirements of A3.3.2.10.

A6.11.2.16. UN Specification cylinders marked with "USA" as country of approval.

A6.12. Ethyl Chloride must be packaged as follows: Package ethyl chloride in any of the following single or combination nonbulk packagings which meet the PG I performance level. (Outage for all containers must be 7.5 percent or more at 21 degrees C (70 degrees F)).

A6.12.1. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware or metal Note: Must not be over 500 g (17.6 ounces) capacity each.	Boxes: ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), or reconstituted wood (4F), fiberboard (4G) Note: Gross weight of 4G must not exceed 30 kg (66 pounds).

A6.12.2. Package in drums as follows:

Inner packaging	Outer packaging
Inner packaging not required	Drum: steel (1A1) not over 100 L (26 gallon) capacity each

A6.12.3. DOT Cylinders. Any DOT specification cylinder prescribed for any compressed gas except acetylene. Cylinders made of aluminum alloy are not authorized.

A6.12.4. Package in capsules with a maximum net mass of 150 g (5.30 ounces) per capsule. The capsule must be free of faults liable to impair its strength. The leakproofness integrity of the closure must be maintained by a secondary means (e.g., cap, crown, seal, binding, etc.) capable of preventing any leakage of the closure while in transportation. Place capsules in a strong outer packaging suitable for the contents and must not exceed a gross mass of 75 kg (165 pounds).

A6.13. Ethylene Oxide must be packaged as follows: Silver mercury, or any of its alloys, or copper must not be used in any part of a packaging, valve, or other packaging appurtenance if that part, during normal conditions of transportation, may come in contact with ethylene oxide liquid or vapor. Copper alloys may be used only where gas mixtures do not contain free acetylene at any concentration that will form copper acetylene. All packaging and gaskets must be constructed of materials which are compatible with ethylene oxide and do not lower the auto-ignition temperature of ethylene oxide.

A6.13.1. Package in boxes as follows: Inner packagings must be hermetically sealed and suitably cushioned in the outer packaging. After filling, each inner packaging shall be determined to be leak-tight by placing the inner packaging in a hot water bath at a temperature, and for a period of time, sufficient to ensure that an internal pressure equal to the vapor pressure of ethylene oxide at 55 degrees C is achieved. Each completed package must meet PG I performance requirements.

Inner packaging	Outer packaging
Glass ampoules / vials Note: The capacity of each inner packaging must not exceed 100 g (3.5 ounces).	Box: fiberboard (4G)
Metal receptacles Note: The capacity of each inner packaging must not exceed 340 g (12 ounces).	Boxes: wooden (4C1, 4C2, 4D, or 4F) or fiberboard (4G)

A6.13.2. In DOT specification cylinders or UN pressure receptacles, as authorized for any compressed gas except acetylene. Eductor tubes must be provided for cylinders over 19L (5 gallons) capacity. Cylinders must be seamless or welded steel (not brazed) with a nominal capacity of no more than 115 L (30 gallons) and must not be liquid full below 82 degrees C (180 degrees F). Before each refilling, each cylinder must be tested for leakage at no less than 103.4 kPa (15 psig) pressure. In addition, each cylinder must be equipped with a fusible type relief device and the effectiveness of the insulation must be such that the charged cylinder will not explode when tested by the method described in CGA Pamphlet C-14 or other equivalent method.

A6.13.3. Steel (1A1) Drums. In steel (1A1) drums of no more than 231 L (61 gallons) and meeting Packing Group I performance standards. The drum must be lagged, of all welded construction with the inner shell having a minimum thickness of 1.7 mm (0.068 inches) and the outer shell must have a minimum thickness of 2.4 mm (0.095 inches). Drums must be capable of withstanding a hydrostatic test pressure of 690 kPa (100 psig). Lagging must be of sufficient thickness so that the drum, when filled with ethylene oxide and equipped with the required pressure relief device, will not rupture when exposed to fire. The drum must not be

liquid full below 85 degrees C (185 degrees F). Before each refilling, each drum must be pressure tested for leakage at no less than 103 kPa (15 psig). Each drum must be equipped with a fusible-type relief device with a yield temperature of 69 to 77 degrees C (157 to 170 degrees F). The capacity of the relief device and the effectiveness of the insulation must be such that the filled drum is capable of passing, without rupture, the test method described in CGA Pamphlet C-14 or other equivalent method.

A6.14. Ethylamine (Monoethlamine, Aminoethane) must be packaged as follows:

A6.14.1. Use metal drums (1A1) which meet PG I performance level requirements.

A6.14.2. Use any DOT specification cylinder prescribed for any compressed gas except acetylene.

A6.15. Arsine; Cyanogen Chloride, Stabilized; Cyanogen, Liquefied; Germane; Liquefied Gas, Toxic; Phosgene; Phosphine must be packaged as follows. See **paragraph 2.8** for additional information.

A6.15.1. Handling Instructions. These items are extremely dangerous. Approved chemical safety mask and clothing must be available when handling this material.

A6.15.2. Packaging Requirements. Package in DOT specification 3A1800, 3AA1800, 3AL1800, 3D, 3E1800, and 33 cylinders. Specification 3A, 3AA, 3AL, 3D, and 33 cylinders must not exceed 57 kg (125 pounds) water capacity (nominal). Shipments of "Arsine" or "Phosphine" will not be accepted for transportation if packaged in a specification 3AL cylinder. Cylinders containing "phosgene" must not exceed a filling density of 125 percent (see A3.3.2.6.). The cylinder must not contain more than 68 kg (150 pounds) of phosgene. Also, each filled cylinder must be tested for leakage before it is offered for transportation and must show absolutely no leakage. This test must consist of immersing the cylinder and valve, without the protection cap attached, in a bath of water at a temperature of approximately 66 degrees C (150 degrees F) for at least 30 minutes. During which time, frequent examinations must be made to identify any escape of gas. After the test has been accomplished the valve of the cylinder must not be loosened before the cylinder is offered for transportation, and must not be loosened during transportation.

A6.16. Bromoacetone; Methyl Bromide; Chloropicrin and Methyl Bromide, or Methyl Chloride Mixtures; Insecticide Gases, Toxic, N.O.S. must be packaged as follows. See **paragraph 2.8** for additional information.

A6.16.1. Handling Instructions. These materials and mixtures are extremely dangerous poisons. Approved chemical safety mask and clothing must be available when handling this material.

A6.16.2. Packaging Requirements:

A6.16.2.1. Pack bromoacetone in ordinary wood (4C1), ordinary wood, with sift-proof walls (4C2), plywood (4D), or reconstituted wood (4F), boxes with inner glass receptacles or tubes in hermetically sealed metal receptacles in corrugated fiberboard cartons. Bottles must not contain over 500 g (17.6 ounces) of liquid each and must be cushioned in cans with at least 12.7 mm (.5 inches) of absorbent cushioning material. The total amount of liquid in the outer box must not exceed 11 kg (24 pounds). Packagings must conform to the PG I performance level.

A6.16.2.2. Pack bromoacetone, methyl bromide, chloropicrin and methyl bromide mixtures, chloropicrin and methyl chloride mixtures, and chloropicrin mixtures charged with a nonflammable, nonliquefied compressed gas in DOT specification 3A, 3AA, 3B, 3C, 3E, 4A, 4B, 4BA, 4BW, or 4C cylinders having not over 113 kg (250 pounds) water capacity (nominal). However, this capacity does not apply to shipments of methyl bromide.

A6.16.2.3. Package methyl bromide mixtures containing up to 2 percent chloropicrin in a fiberboard (4G) box with inside metal cans containing not over 0.454 kg (1 pound) each, or inside metal cans with a minimum wall thickness of 0.178 mm (0.007 inch) containing not over 0.7945 kg (1 3/4 pounds) each. The 0.454 kg (1 pound) can must be capable of withstanding an internal pressure of 896.6 kPa (130 psig) without leakage or permanent distortion. Vapor pressure of the contents must not exceed 896.6 kPa (130 psig) at 55 degrees C (130 degrees F). The 0.7945 kg (1 3/4 pound) can must be capable of withstanding an internal pressure of 965.6 kPa (140 psig) without leakage or permanent distortion. Vapor pressure of the contents must not exceed 965.6 kPa (140 psig) at 55 degrees C (130 degrees F). Cans must not be liquid full at 55 degrees C (130 degrees F). Cans must be constructed of tinplate or lined with suitable material and must have concave or pressure ends.

A6.17. Gas Identification Sets must be packaged as follows: Gas identification sets containing toxic material must meet the requirements of the PG I performance level.

A6.17.1. Pack in hermetically sealed glass inner receptacles not over 40 ml (1.4 fluid ounces). Each glass inner receptacle must be placed in a sealed fiberboard receptacle cushioned with absorbent material. Not more than 12 fiberboard receptacles may be placed in a 4G fiberboard box. No more than four fiberboard boxes, well-cushioned, may be placed in a steel cylinder. The cylinder must have a wall thickness of at least 3.7 mm (0.146 inches) and must have a hermetically sealed steel closure.

A6.17.2. When the toxic material is absorbed in a medium such as activated charcoal or silica gel, pack gas identification sets as follows:

A6.17.2.1. If the liquid toxic material does not exceed 5 ml (0.2 fluid ounces) or the solid toxic material does not exceed 5 g (0.2 ounces), they may be packed in glass inner receptacles of not over 120 ml (4.1 fluid ounces) each. Each glass receptacle, cushioned with absorbent material, must be packed in a hermetically sealed metal can. The metal can must have a wall thickness of not less than 0.30 mm (0.012 inch). Then the metal cans must be packed in wooden boxes (4C1, 4C2, 4D, or 4F) surrounded on all sides by at least 25 mm (1 inch) of dry sawdust. Not more than 100 ml (3.4 fluid ounces) or 100 g (3.5 ounces) of toxic materials may be packed in one outer wooden box.

A6.17.2.2. If the liquid toxic material does not exceed 5 ml (0.2 fluid ounces) or the solid toxic material does not exceed 20 g (0.7 ounces), they may be packed in glass inner receptacles with screw-top closures of not less than 60 ml (2 fluid ounces) that are hermetically sealed. Twelve bottles containing toxic material not exceeding 100 ml (3.4 ounces) for liquids or 100 g (3.5 ounces) for solids may be placed in a plastic carrying case. Each glass receptacle must be surrounded by absorbent cushioning material and must also be separated from each other by sponge rubber partitions. The plastic carrying

case must be placed in a tightly fitted fiberboard box and then placed in a tight fitting wooden box (4C1, 4C2, 4D, or 4F).

A6.18. Hexaethyl Tetraphosphate and Compressed Gas Mixtures; Insecticide Gases, Toxic, N.O.S.; Parathion and Compressed Gas Mixture; Tetraethyl Dithiopyrophosphate and Gases, in Solution or Tetraethyl Dithiopyrophosphate and Gases, Mixtures (LC50 Less Than or Equal to 200 Parts Per Million (ppm)); Tetraethyl Dithiopyrophosphate and Gases, in Solution or Tetraethyl Dithiopyrophosphate and Gases, Mixtures (LC50 over 200 but not Greater Than 5000 ppm); Tetraethyl Pyrophosphate and Compressed Gas Mixture (LC50 Less Than or Equal to 200 ppm); Tetraethyl Pyrophosphate and Compressed Gas Mixture (LC50 Over 200 but not greater than 5000 ppm) must be packaged as follows: See **paragraph 2.8** for additional information.

A6.18.1. Handling Instructions. These materials and mixtures are extremely dangerous poisons. Approved chemical safety mask and clothing must be available when handling this material.

A6.18.2. Packaging Requirements.

A6.18.2.1. Hexaethyl tetraphosphate, parathion, tetraethyl dithiopyrophosphate, and tetraethyl pyrophosphate may be mixed with a nonflammable compressed gas. This mixture must not contain more than 20 percent by weight of an organic phosphate and must be packaged in DOT specification 3A240, 3AA240, 3B240, 4A240, 4B240, 4BA240, or 4BW240 cylinders meeting the following requirements:

A6.18.2.1.1. Each cylinder must not be charged with more than 5 kg (11.0pounds) of the mixture. The maximum filling density of the cylinder must not exceed 80 percent of its water capacity.

A6.18.2.1.2. Each cylinder must be charged in compliance with A3.3.2.6.

A6.18.2.1.3. No cylinder may be equipped with an education tube or a fusible plug.

A6.18.2.1.4. No cylinder may be equipped with any valve unless the valve is a type approved by the DOT.

A6.18.2.2. Cylinders must be overpacked in a fiberboard box (4G) and packaged in a way to protect each valve or other closing device from damage. Except as provided in A6.17.2.2, no more than four cylinders may be packed in a box. Each box with its closing device protection must be sufficiently strong to protect all parts of each inside cylinder from deformation or breakage if the completed package is dropped 1.8 m (5.9 feet) onto solid concrete impacting at the package's weakest point.

A6.18.2.3. Cylinders may be packed in a strong wooden box (4C1, 4C2, 4D, or 4F) and packed in a way to protect each valve or other closing device from damage. No more than twelve cylinders may be packed in one outer wooden box. Each wooden box with its closing device protection must be sufficiently strong to protect all parts of each inside cylinder from deformation or breakage if the completed package is dropped 1.8 m (5.9 feet) onto solid concrete impacting at the package's weakest point.

A6.19. Packaging for Class 2.3 Materials, Poisonous by Inhalation (Hazard Zone A) must be packaged as follows:

A6.19.1. Handling Instructions. These items are extremely dangerous. Approved chemical safety mask and clothing must be available when handling this material.

A6.19.2. Packaging Requirements. Package Class 2.3, PG I materials with an Inhalation Hazard Zone A as follows:

A6.19.2.1. In DOT cylinders as identified in 49 CFR Part 178 Subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of A3.3.2.

A6.19.2.2. Pack in an inner drum (1A1, 1B1, 1H1, 1N1, or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The outer 1A2 and 1H2 drums must withstand a hydrostatic test pressure of 100 kPa (15 psi). The capacity of the inner drum must not exceed 220 L (58 gallons). The inner drum must also meet the following requirements:

A6.19.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR §178.605) of 550 kPa (80 psig).

A6.19.2.2.2. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR §178.604) using an internal air pressure at 55 degrees C (130 degrees F) of at least twice the vapor pressure of the material to be packaged.

A6.19.2.2.3. Have screw-type closures that are:

A6.19.2.2.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A6.19.2.2.3.2. Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation.

A6.19.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A6.19.2.2.4. Meet the following minimum thickness requirements:

A6.19.2.2.4.1. If the capacity of the inner drum is less than or equal to 120 L (32 gallons) the minimum thickness of the inner drum is: 1.3 mm (0.051 inches) for 1A1 and 1N1 drums, 3.9 mm (0.154 inches) for 1B1 drums, 3.16 mm (0.124 inches) for 1H1 drums, 1.58 mm (0.0622 inches) for the plastic inner container and 0.96 mm (0.0378) for the outer steel drum of a 6HA1 drum.

A6.19.2.2.4.2. If the capacity of the inner drum is greater than 120 L (32 gallons) the minimum thickness of the inner drum is: 1.7 mm (0.067 inches) for 1A1 and 1N1 drums, 4.7 mm (0.185 inches) for 1B1 drums, 3.16 mm (0.124 inches) for 1H1 drums, 1.58 mm (0.0622 inches) for the plastic inner container and 1.08 mm (0.0378) for the outer steel drum of a 6HA1 drum.

A6.19.2.2.5. Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface

(side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum.

A6.19.2.3. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal securely cushioned with a nonreactive absorbent material. The package must be packed within a leak-tight packaging of metal or plastic, then packed in a steel drum (1A2), aluminum drum (1B2), metal drum (other than steel or aluminum (1N2)), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2). The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure, must have the closure held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A6.20. Nitric Oxide must be packaged as follows: See **paragraph 2.8** for additional information.

A6.20.1. Handling Instructions. Nitric oxide is extremely dangerous and poisonous. Approved chemical safety mask and clothing must be available when handling this material.

A6.20.2. Packaging Requirements. Pack nitric oxide in DOT 3A1800, 3AA1800, 3E1800, or 3AL1800 cylinders, charged to a pressure of not more than 5,170 kPa (750 psi) at 21 degrees C (70 degrees F). Cylinders must be equipped with a valve of stainless steel and a valve seat of material that is not deteriorated by contact with nitric oxide or nitrogen dioxide. Cylinders or valves must not be equipped with safety devices (pressure relief) of any type. Ensure valve outlets are sealed by a solid threaded cap or plug and an inert gasketing material. Each cylinder must be cleaned as identified in 49 CFR §173.337(b).

A6.20.2.1. Pack cylinders, DOT 3E1800, in strong wooden boxes to protect valves from injury or accidental functioning under conditions incident to transportation.

A6.20.2.2. Cylinders, DOT 3A, 3AA, and 3AL, must have their valves protected by metal caps, or other equally protective guards, securely attached to the cylinders and be of sufficient strength to protect the valves from injury or accidental functioning under conditions incident to transportation.

A6.21. Ethyl Methyl Ether must be packaged as follows: Each packaging must meet the requirements of the PG I performance level.

A6.21.1. Package in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, metal or glass ampoules	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G), or plastic (1H1 or 1H2) *or* Jerricans: steel (3A1 or 3A2), plastic (3H1 or 3H2) *or* Boxes: steel (4A1 or 4A2), aluminum (4B1 or 4B2), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2)

A6.21.2. Package in drums or jerricans as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2) or plastic (1H1 or 1H2) *or* Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A6.21.3. Package in the following single composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, fiber or plastic (6HA1, 6HB1, 6HG1, 6HH) *or* Boxes: steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, 6HG2)

A6.21.4. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum or fiber (6PA1, 6PB1, 6PG1) *or* Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, 6PG2) *or* solid or expanded plastic packaging (6PH1 or 6PH2)

A6.21.5. DOT Cylinders. Any DOT specification cylinders as prescribed for any compressed gas, except for acetylene.

A6.22. Gas Generator Assemblies must be packaged as follows: Package gas generator assemblies (aircraft) containing liquefied non-flammable, non-toxic gas and a solid propellant cartridge as follows:

A6.22.1. Package the gas in specification steel cylinders authorized for any compressed gas except acetylene not exceeding 10.5L (2.8 gallons) internal volume and having a minimum design burst pressure of 19,000 kPa (2,857 psi).

A6.22.2. Protect fittings against damage under conditions normal to transport, any trigger must be fitted with a safety locking pin, and a non-propulsive plug must be installed on the discharge tube; and

A6.22.3. Individually and tightly pack each complete unit to prevent movement in wooden boxes (4C1 or 4C2), plywood boxes (4D), reconstituted wood boxes (4F), fiberboard boxes (4G), or plastic boxes (4H1 and 4H2) of PG II performance level, or in the original manufacturer's transit box.

A6.23. Fuel Cell Cartridges.

A6.23.1. The weight of the fuel cells must not exceed 1 kg Package fuel cell cartridges in drums, jerricans or boxes as follows:

Inner packaging	Outer packaging
Not required	Drums: Plywood (1D), Fibre (1G), Plastic (1H2) *or* Jerricans: Plastic (3H2) *or* Boxes: Wood (4C1, 4C2), Plywood (4D), Reconstituted Wood (4F), Fibreboard (4G), Plastic (4H2)

A6.24. Fuel Cell Cartridges Contained in Equipment.

A6.24.1. UN specification packaging is not required. Fuel cells installed in equipment must be protected against short circuit and the entire system must be protected against inadvertent operation. Fuel cell systems must not charge batteries during transport.

A6.25. Fuel Cell Packed With Equipment.

A6.25.1. UN specification packaging is not required. Fuel cells packed with equipment must be packed in inner packagings or placed in the outer packaging with cushioning material or divider(s) in order to protect fuel cartridges from damage during transportation. The maximum number of fuel cell cartridges in the intermediate packaging may not be more than the number required to power the equipment plus two spares.

A6.26. Metal hydride storage systems.

A6.26.1. The following packing instruction is applicable to transportable UN Metal hydride storage systems (UN3468) with pressure receptacles not exceeding 150 liters (40 gallons) in water capacity and having a maximum developed pressure not exceeding 25 MPa. Metal hydride storage systems must be designed, constructed, initially inspected and tested in

accordance with ISO 16111. Steel pressure receptacles or composite pressure receptacles with steel liners must be marked in accordance with 49 CFR §173.301b(f) which specifies that a steel UN pressure receptacle bearing an “H” mark must be used for hydrogen bearing gases or other gases that may cause hydrogen embrittlement. Requalification intervals must be no more than every five years as specified in 49 CFR §180.207 in accordance with the requalification procedures prescribed in ISO 16111.

Attachment 7

CLASS 3--FLAMMABLE LIQUIDS

A7.1. General Requirements. For military members, failure to obey the mandatory provisions from **paragraphs A7.2** through **A7.9** and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from **paragraph A7.2** through **A7.9** and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and fully comply with inner/receptacle packaging and outer container options as mandated per each packaging paragraph. Not all packaging paragraphs are inclusive and packaging is based on category of flammable liquid, cylinder type and quantity shipped. This attachment contains information concerning the packaging for Class 3 material (flammable liquids). See **Attachment 3** for other details concerning Class 3 material.

A7.2. Packaging for Class 3 Materials. Class 3 materials must be packaged as follows:

A7.2.1. Package in drums, boxes, jerricans, or barrels as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, or metal	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or removable head plastic (1H2) *or* Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2) *or* Jerricans: removable head steel (3A2), plastic removable head (3H2), or aluminum removable head (3B2) *or* Barrel: wooden (2C2) Note: Wood barrels not authorized for PG I material.

A7.2.2. Package in the following drums, jerricans, or barrels:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Not required	Drums: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal drum other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), fiber (1G) with liner, or plastic (1H1 or 1H2) Note: Fiber drum with liner only authorized for PG III material. *or* Jerricans: steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) *or* Barrel: wooden (2C1) Note: Wooden Barrels not authorized for PG I material.

A7.2.3. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Boxes: steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2 or 6HG2) *or* Drum: steel, aluminum, fiber, plastic or plywood (6HA1, 6HB1, 6HG1, 6HH1, or 6HD1) Note: Plywood drum (6HD1) only authorized for PG II or PG III.

A7.2.4. Package in the following composite packages:

Inner packaging	Outer packaging
Receptacle: glass, porcelain or stoneware	Drum: steel, aluminum, fiber, plywood drum (6PA1, 6PB1, 6PG1 or 6PD1) or wickerwork hamper (6PD2) Note: Plywood drum (6PD1) and wicker work hamper (6PD2) only authorized for PG II or PG III. *or* Box: steel (6PA2), aluminum (6PB2), wooden (6PC), fiberboard (6PG2), solid plastic (6PH1), or expanded plastic packaging (6PH2)

A7.2.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A7.2.6. BLU-27/BLU-32 Firebombs must be packaged as follows. Pack BLU-27 firebombs according to SPI 1325-912-3175. Pack BLU-32 firebombs according to SPI 1325-912-3175 or SPI 1325-483-3035. Do not stack containers more than two high for air transportation. Ship firebombs as flammable liquids, N.O.S..

A7.2.7. DOT 5L Jerrican. DOT 5L jerry cans must be completely drained to the maximum extent possible.

A7.2.8. MIL-D-23119 Drum. MIL-D-23119 500-gallon capacity collapsible fabric drums authorized under mobility operations conducted according to DTR 4500.9-R, Part III. Five hundred (500) gallon fabric drums shipped on other than mobility missions must be drained to the greatest extent possible.

A7.2.9. Bulk Fuel. Except as authorized in this manual, servicing trucks, trailers, semitrailers, or storage tanks containing bulk fuel, or any bulk hazardous material must not be transported by air. The following draining/purging requirements apply, as appropriate:

A7.2.9.1. Purge bulk tanks for all liquids with a flash point below 38 degrees C (100 degrees F), regardless of whether the technical manual only requires draining. If other hazardous materials are present, certify to the appropriate packaging paragraph. If no other hazards are present, comply with **paragraph A3.1.16.4** to identify purged tanks.

A7.2.9.2. Drain, but need not purge, liquids with a flash point at or above 38 degrees C (100 degrees F), unless the technical manual specifically requires purging. If other hazardous materials are present, certify to the appropriate packaging paragraph.

A7.2.9.3. Bulk combustible liquids flash points above 60 degrees C (140 degrees F) must be transported in UN specification packaging (e.g., IBCs) meeting air eligibility requirements of **paragraph A3.1.7.2** for PG III.

A7.3. Refrigerating Machines must be packaged as follows: A refrigerating machine assembled for shipment and containing 7 kg (15 pounds) or less of flammable liquid for operation in a strong, tight receptacle is excepted from specification packaging, marking, and labeling except for the PSN of the flammable liquid.

A7.4. Aircraft Hydraulic Power Unit Fuel Tank must be packaged as follows:

A7.4.1. Handling Instructions. In the event of a leak during transportation of hydrazine, crew members use their aircraft oxygen masks in a positive pressure mode.

A7.4.2. Packaging Requirements. Aircraft hydraulic power unit fuel tanks containing a mixture of anhydrous hydrazine and monomethyl hydrazine (M86 fuel) and designed for installation as complete units in aircraft are excepted from specification packaging requirements if the units comply with one of the following:

A7.4.2.1. The unit must consist of an aluminum pressure vessel made from tubing and having welded heads. Primary containment of the fuel within this vessel must consist of a welded aluminum bladder having a maximum internal volume of 46 L (12 gallons). The outer vessel must have a minimum design gauge pressure of 1.275 kPa (185 psi) and a minimum burst gauge pressure of 2.755 kPa (400 psi). Each vessel must be leak-checked during manufacture and before shipment and must be found leak proof. The complete inner unit must be securely packed in noncombustible cushioning material, in a strong

outer tightly closed metal packaging that will adequately protect all fittings. The maximum quantity of fuel per unit and package is 42 L (11 gallons).

A7.4.2.2. The unit must consist of an aluminum pressure vessel. Primary containment of the fuel within this vessel must consist of a welded hermetically sealed fuel compartment with an elastomeric bladder having a maximum internal volume of 46 L (12 gallons). The pressure vessel must have a minimum design gauge pressure of 5.17 kPa (750 psi). Each vessel must be leak-checked during manufacture and before shipment and must be found leak proof. The complete inner unit must be securely packed in noncombustible cushioning material, in a strong outer tightly closed metal packaging that will adequately protect all fittings. The maximum quantity of fuel per unit and package is 42 L (11 gallons).

A7.5. Packaging for Class 3 Materials, Poisonous by Inhalation (Hazard Zone A or B). Class 3 materials with an Inhalation Hazard (Hazard Zone A and B) must be packaged as follows:

A7.5.1. Handling Instructions. These items are extremely dangerous. Approved chemical safety mask and clothing must be available when handling this material.

A7.5.2. DOT Cylinders. Package in DOT specification cylinders as identified in 49 CFR Part 178 Subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of A3.3.2.

A7.5.3. Pack in an inner drum (1A1, 1B1, 1N1, 1H1, or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, or 1N1) must not exceed 220 L (58 gallons). Cushion the inner drum within the outer drum with a shock-mitigating, non-reactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum. There must also be at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet all of the following requirements:

A7.5.3.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR §178.605) of 550 kPa (80 psig).

A7.5.3.2. Satisfactorily withstand a leak proof test (as outlined in 49 CFR §178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A7.5.3.3. Have screw-type closures that meet all the following requirements:

A7.5.3.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A7.5.3.3.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A7.5.3.4. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A7.5.3.5. Meet the following minimum thickness requirements:

A7.5.3.5.1. 1A1 and 1N1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.3 mm (0.051 inches). 1B1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches).

A7.5.3.5.2. 1A1 and 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.7 mm (0.067 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches).

A7.5.4. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal securely cushioned with a non reactive absorbent material. The package must be packed within a leak-tight packaging of metal or plastic, then packed in a steel drum (1A2), aluminum drum (1B2), metal drum (other than steel or aluminum (1N2)), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2). The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure must have a screw-type closure, which is held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A7.5.5. This paragraph is only authorized for Crotonaldehyde, Stabilized; Diketene, Stabilized; Dimethylhydrazine, Symmetrical; Isopropyl Cloroformate and Methyl Orthosilicate. Pack in metal drums (1A1, 1B1, or 1N1), or plastic drum (1H1), then place in metal drums (1A2 or 1H2), or a plastic receptacle with outer steel drum (6HA1). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, 1N1, or 1H1) must not exceed 220 L (58 gallons). Cushion the inner drum within the outer drum with a shock-mitigating, non reactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum. There must also be at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must meet all of the following requirements:

A7.5.5.1. Satisfactorily withstand a leak-proof test (as outlined in 49 CFR §178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A7.5.5.1.1. Have screw-type closures that meet all the following requirements:

A7.5.5.1.2. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A7.5.5.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A7.5.5.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A7.5.5.4. Meet the following minimum thickness requirements:

A7.5.5.4.1. 1A1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 0.69 mm (0.027 inches). 1B1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 2.79 mm (0.110 inches). 1H1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.14 mm (0.045 inches). 6HA1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.96 mm (0.038 inches) for the outer steel drum.

A7.5.5.4.2. 1A1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.08 mm (0.043 inches). 1B1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches). 1H1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.125 inches). 6HA1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.96 mm (0.038 inches) for the outer steel drum.

A7.5.5.4.3. 1A1 or 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.35 mm (0.053 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches). 1H1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.124 inches). 6HA1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 1.08 mm (0.43 inches) for the outer steel drum.

A7.6. Polyester Resin Kits must be packaged as follows: Polyester resin and fiberglass repair kits consist of two components: a base material in Class 3, PG II or III, and an organic peroxide activator. Only organic peroxides of Type D, E, or F not requiring temperature controls are authorized. Assign PG II or III according to the criteria for Class 3, applied to the base material. Ensure each component is separately packed in an inner packaging. The components may be placed in the same outer packaging provided they will not react dangerous in the event of leakage.

A7.6.1. Package organic peroxides in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Plastic tube packaging *or* Flexible tube packaging *or* Note: Maximum quantity of organic peroxide per inner packaging is 125 ml (4.22 ounces) for liquids and 500 g (1 lb.) for solids.	Drums: steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), or plastic (1H2) *or* Jerricans: steel (3A2) or plastic (3H2) *or* Boxes: fiberboard (4G), wooden (4C1 or 4C2), reconstituted wood (4F), plywood (4D), or plastic (4H2)

A7.6.2. Package flammable liquids in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Receptacle: glass or earthenware, plastic, metal or aluminum	Drums: steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), or plastic (1H2) *or* Jerricans: steel (3A2) or plastic (3H2) *or* Boxes: fiberboard (4G), wooden (4C1 or 4C2), reconstituted wood (4F), plywood (4D), or plastic (4H2)

A7.7. Fuel Cell Cartridges.

A7.7.1. Package fuel cell cartridges in drums, jerricans or boxes as follows:

Inner packaging	Outer packaging
Receptacle: cartridge	Drums: plywood (1D), fiber (1G) or plastic (1H2) *or* Jerricans: plastic (3H2) *or* Boxes: fiberboard (4G), wooden (4C1 or 4C2), reconstituted wood (4F), plywood (4D), or plastic (4H2)

A7.8. Fuel Cell Cartridges Contained in Equipment.

A7.8.1. UN specification packaging is not required. Fuel cells installed in equipment must be protected against short circuit and the entire system must be protected against inadvertent operation. Fuel cell systems must not charge batteries during transport.

A7.8.2. Protect the terminals of the installed fuel cells to prevent short circuit by use of protective coverings, taping, etc.

A7.9. Fuel Cell Packed With Equipment.

A7.9.1. UN specification packaging is not required. Fuel cells packed with equipment must be packed in inner packagings or placed in the outer packaging with cushioning material or divider(s) in order to protect fuel cartridges from damage during transportation. The

maximum number of fuel cell cartridges in the intermediate packaging may not be more than the number required to power the equipment plus two spares.

A7.10. Chlorosilanes must be packaged as follows: Packaging must meet the PG I or PG II performance standards.

A7.10.1. Package in the following combination drums, or boxes:

Inner packaging	Outer packaging
Receptacles: Glass, or steel	Drums: steel (1A2), plywood (1D), fiber (1G), or plastic (1H2) *or* Boxes: steel (4A), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)

A7.10.2. Package in the following composite drums:

Inner receptacle	Outer packaging
Plastic	Drums: steel drum (6HA1),

A7.10.3. Package in the following single drums, or jerricans:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1) *or* Jerricans: steel (3A1)

A7.10.4. Package in Cylinders as prescribed for any compressed gas, except Specification 8, 3HT, and aluminum cylinders.

Attachment 8

CLASS 4--FLAMMABLE SOLIDS, SPONTANEOUSLY COMBUSTIBLE MATERIAL, AND DANGEROUS WHEN WET MATERIAL

A8.1. General Requirements. For military members, failure to obey the mandatory provisions from **paragraphs A8.2** through **A8.21** and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from **paragraph A8.2** through **A8.21** and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and fully comply with the inner/receptacle and outer container options as mandated per each packaging paragraph. Not all packaging paragraphs are inclusive and packaging container selection is based on the type of flammable solid type and quantity shipped. This attachment contains information concerning the packaging and general handling instructions for Class 4.1 (flammable solids), Class 4.2 (spontaneously combustible material), and Class 4.3 (dangerous when wet material). See **Attachment 3** for other details concerning Class 4 material.

A8.2. Packaging for Class 4 Liquids. Class 4 liquids must be packaged as follows.

A8.2.1. Package in drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, or metal	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or removable head plastic (1H2) *or* Barrel: wood (2C2) Note: Not authorized for PG I material. *or* Jerrican: removable head steel (3A2), plastic removable head (3H2), or aluminum removable head (3B2) *or* Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expended plastic box (4H1), solid plastic (4H2)

A8.2.2. Package in the following drums or barrels:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Not required	Drums: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), fiber (1G) with liner, plastic (1H1), and removable head plastic Note: Fiber drum (1G) not authorized for PG 1 materials. *or* Barrel: wood (2C1) Note: Not authorized for PG 1 materials.

A8.2.3. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drum: steel, aluminum, plywood, fiber or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) Note: Plywood (6HD1) not authorized for PG I material. *or* Box: steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2 or 6HG2)

A8.2.4. Package in the following composite packages:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	Drum: steel, aluminum, fiber, plywood or wickerwork hamper (6PA1, 6PB1, 6PG1, 6PD1 or 6PD2) Note: Plywood drum or wickerwork hamper (6PD1 or 6PD2) not authorized for PG I material. *or* Box: steel, aluminum, wooden, fiberboard, or expanded plastic packaging (6PA2, 6PB2, 6PC, 6PG2, 6PH1, or 6PH2)

A8.2.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A8.3. Packaging for Class 4 Solids. Class 4 solids must be packaged as follows: See also A3.3.4.2.

A8.3.1. Package in drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, metal or glass ampoules	Drums: removable head steel (1A2), removable head aluminum (1B2), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or removable head plastic (1H2) *or* Barrel: wood (2C2) *or* Jerrican: removable head steel (3A2), plastic removable head (3H2), or aluminum removable head (3B2) *or* Boxes: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic (4H2)

A8.3.2. Package in drums, barrels, jerricans, boxes, or bags as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Not required	Drums: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal drum other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), plastic (1H1), or removable head plastic (1H2) Note: Plywood (1D) not authorized for PG I material. *or* Barrel: wood (2C2) Note: Wood 2C2 not authorized for PG I material. *or* Jerrican: steel (3A1), removable head steel (3A2), plastic (3H1), plastic removable head (3H2), aluminum (3B1) or aluminum removable head (3B2) *or* Boxes: steel (4A), steel (4A) with liner, aluminum (4B), aluminum (4B) with liner, ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic (4H2 or 4H1) *or* Bags: woven plastic (5H1, 5H2, or 5H3); plastic film (5H4); textile (5L1, 5L2, or 5L3); paper, multiwall, water-resistant (5M2) Note: Bags not authorized for PG I material.

A8.3.3. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drum: steel, aluminum, plywood, fiber or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) *or* Box: steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2 or 6HG2)

A8.3.4. Package in the following composite packages:

Inner receptacle	Outer packaging

Inner receptacle	Outer packaging
Glass, porcelain or stoneware	Drum: steel, aluminum, plywood or fiber (6PA1, 6PB1, 6PD1 or 6PG1) *or* Box: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC or 6PG2) *or* expanded plastic packaging (6PH1 or 6PH2)

A8.4. Class 4 Materials requiring CAA. Prepare Class 4 materials referenced in **Table A4.1** to this paragraph, according to a competent authority approval (CAA). Packaging must be in compliance with the CAA. See **paragraph 2.5** for more information on CAAs.

A8.5. Pyrophoric Liquid Materials (Class 4.2). Pyrophoric liquid materials must be packaged as follows: See also **A3.3.4.2**.

A8.5.1. Steel or Nickel Cylinders. Specification steel or nickel cylinders prescribed for any compressed gas except acetylene having a minimum design pressure of 1206 kPa (175 psi). The following applies:

A8.5.1.1. Cylinders with valves must be equipped with steel valve protection caps or collars, or

A8.5.1.2. Pack in wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), or plastic box (4H1 or 4H2). Secure cylinders to prevent movement in the box and when offered for transportation, load so that the pressure relief devices remain in the vapor space of the cylinder.

A8.5.2. Boxes. Wooden boxes (4C1, 4C2, 4D, or 4F), or fiberboard boxes (4G) with not more than four strong, tight metal cans with inner receptacles of glass or metal. Inner receptacles must not be over 1 L (0.3 gallons) capacity each. Inner receptacles must have a positive screw cap closure with gasket. Cushion inner packagings on all sides with dry, incombustible absorbent cushioning material in a quantity sufficient to absorb the entire contents. The strong, tight metal cans must be closed by positive means, not by friction.

A8.5.3. Drums. Steel drums (1A2) or fiber drums (1G) not exceeding 220 L (58 gallons) capacity each with inner metal cans not over 4 L (1 gallon) capacity each, closed by positive means, not by friction. The following additional requirements must be met:

A8.5.3.1. Inner packaging must have no opening exceeding 25 mm (1 inch) in diameter and must be surrounded with non combustible absorbent cushioning material.

A8.5.3.2. Net quantity of pyrophoric liquids must not exceed two-thirds of the rated capacity of the outer drum. For example, a 220 L (58 gallon) outer drum must not contain more than 147 L (39 gallons) of pyrophoric liquids.

A8.5.3.3. A metal plate separator in addition to the noncombustible absorbent cushioning material must separate each layer of inner packagings.

A8.6. Diphenyloxide-4, 4-Disulphohydrazide; N, N Dinitroso-N, N Dimethyl Teraphthlamide (not more than 72 percent as a paste) must be packaged as follows: Temperature controls are not

required. Maximum gross weight must not exceed 110 pounds (50 kg). Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: fiber (1G) with a plastic liner or internal coating; or sift-proof fiber (1G)

A8.7. 1,1 Azodi-(Hexahydrobenzonitrile); Benzene Sulfohydrazide; Benzene-1,3-Disulfohydrazide (not more than 52 percent as a paste); N,N-Dinitrosopentamethylenetetramine (not more than 82 percent with phlegmatizer) must be packaged as follows: Temperature controls are not required.

A8.7.1. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: fiber (1G) with a plastic liner or internal coating; or sift-proof fiber (1G) Note: Maximum gross weight is 50 kg (110 pounds).

A8.7.2. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacle: single plastic bag	Box: fiberboard (4G) Note: Maximum gross weight is 50 kg (110 pounds).

A8.7.3. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: plastic boxes, plastic bottles, or jars Note: Maximum weight of inner packaging is 5 kg (11 pounds).	Box: fiberboard (4G) Note: Maximum gross weight is 40 kg (88 pounds).

A8.8. 3-Chloro-4-Diethylaminobenzenediazonium Zinc Chloride; 4-Dipropylaminobenzenediazonium Zinc Chloride; Sodium 2-Diazo-1Naphthol-4-Sulphonate; Sodium 2-Diazo-1-Naphthol-5-Sulphonate must be packaged as follows: Temperature controls are not required.

A8.8.1. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: fiber (1G) with a plastic liner or internal coating Note: Maximum gross weight is 50 kg (110 pounds).

A8.8.2. Package in drums as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Receptacle: plastic bag	Drums: steel removable head (1A2) or an aluminum removable head (1B2) Note: Maximum gross weight is 55 kg (121 pounds).

A8.9. 2-Diazo-1-Naphthol-4-Sulphochloride and 2-Diazo-1-Naphhthol-5-Sulphochloride. Temperature controls are not required. Must be packaged in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: fiber (1G) with plastic liner or internal coating Note: Maximum gross weight is 50 kg (110 pounds).

A8.10. Barium Azide, Wetted (with not less than 50 percent water by mass) must be packaged as follows: Pack barium azide, wetted (with not less than 50 percent water by mass) in the following packaging. Inner glass receptacles must not be over 0.5 kg (1.1 pounds) capacity each. Inner receptacles must have rubber stoppers wire-tied for securement. If transportation is to take place when freezing weather is possible, a suitable antifreeze solution must be used to prevent freezing. Package in boxes or drums as follows:

Inner packaging	Outer packaging
Receptacles: glass	Boxes: wood (4C1, 4C2, 4D, or 4F) *or* Drum: fiber (1G)

A8.11. Calcium Pyrophoric; Magnesium Diphenyl; Metal Catalyst, Dry; Pyrophoric Metals, N.O.S. and Pyrophoric Solids, N.O.S. must be packaged as follows:

A8.11.1. Inner receptacles must have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 15 kg (33 pounds) each. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: metal	Boxes: wood (4C1, 4C2, 4D, or 4F)

A8.11.2. Inner receptacles must have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 7.5 kg (17 pounds) each. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: metal	Box: fiberboard (4G)

A8.11.3. Inner receptacles must have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 15 kg (33 pounds) each. Package in drums as follows:

Inner packaging	Outer packaging
Receptacles: metal	Drums: fiber (1G) or plywood (1D)

A8.11.4. Package in drums as follows:

Inner packaging	Outer packaging
Not required	Drum: steel (1A1 or 1A2) Note: Gross weight must not exceed 150 kg (331 pounds) each.

A8.11.5. Package in boxes as follows:

Inner packaging	Outer packaging
Receptacles: metal Note: Maximum net weight for each inner packaging is 15 kg (33 pounds). Inner packages shall be hermetically sealed and have threaded closures.	Boxes: steel (4A)

A8.12. Films, Nitrocellulose Base (gelatin coated [except scrap]) must be packaged as follows: Each reel must be in a tightly closed inner packaging with its cover securely held in place with adhesive tape or adhesive paper. Package in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Receptacles: metal can, polypropylene canister, or strong fiberboard	Drums: steel (1A2), aluminum (1B2), or plywood (1D), or fiber (1G) Note: Fiber drums (1G) may only be used for film not exceeding 600 m (1969 feet). *or* Jerrican: steel (3A2) *or* Boxes: wood (4C1 or 4C2), plywood (4D), or reconstituted wood (4F), fiberboard (4G) Note: Fiberboard (4G) may only be used for film not exceeding 600 m (1969 feet).

A8.13. Fusees (railway or highway) must be packaged as follows:

A8.13.1. General Requirements. Fusees that are equipped with spikes must have reinforced ends to prevent penetration of the spikes through the outer packaging. Also, the packages must be capable of passing at least one drop test with the spike in a downward position.

A8.13.2. Package in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A2), plywood (1D), or fiber (1G) *or* Jerrican: steel (3A2) *or* Boxes: wood (4C1, 4C2), plywood (4D), reconstituted (4F), fiberboard (4G)

A8.14. Matches, Fusee; Matches, Safety (book, card, or strike-on-box); Matches Strike-Anywhere, and Matches, Wax Vesta must be packaged as follows: Matches must be of a type

that will not ignite spontaneously when subjected to a temperature of 93.3 degrees C (200 degrees F) for 8 consecutive hours in a properly conducted laboratory test.

A8.14.1. Do not pack matches, strike-anywhere, in the same outer packaging with any other article except safety matches or wax vesta matches. The safety matches or wax vesta matches must be packaged in separate inside containers. Each inside packaging must not contain over 700 matches. Gross weight must not be over 27.2 kg (60 pounds) for fiberboard boxes or 45.4 kg (100 pounds) for all other outer packagings.

A8.14.2. Do not pack fusee matches, in the same outer packaging with any other article except safety matches or wax vesta matches. The safety matches or wax vesta matches must be packaged in separate inside containers. Each inside packaging must not contain over 700 matches. Gross weight must not be over 27.2 kg (60 pounds) for fiberboard boxes or 45.4 kg (100 pounds) for all other outer packagings.

A8.14.3. Tightly pack safety matches (strike-on-box, book, and card) or wax vesta matches in securely closed inside containers then packed in an outer packaging. Safety matches may be packed in the same outer packaging with non hazardous materials.

A8.14.4. Package in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	Drums: steel (1A2), aluminum (1B2), plywood (1D) or fiber (1G) *or* Jerrican: steel (3A2) *or* Boxes: wood (4C1, 4C2), plywood (4D), reconstituted (4F) or fiberboard (4G)

A8.15. Pentaborane must be packaged as follows: Package in any DOT specification cylinder, except those specified for acetylene.

A8.16. Phosphorus, White or Yellow, Dry, or Under Water, or in Solution must be packaged as follows: The packaging requirements are:

A8.16.1. Phosphorus White or Yellow. Phosphorus white or yellow, when dry, must be cast solid and shipped in containers as follows:

A8.16.1.1. Steel drums (1A2) not over a 115 L (30 gallons) capacity each.

A8.16.1.2. In projectiles or bombs without bursting elements.

A8.16.2. Phosphorus White or Yellow in Water or Solution. Pack phosphorus, white or yellow, when in water or solution, in:

A8.16.2.1. Wooden boxes (4C1, 4C2, 4D, or 4F) with inside soldered or hermetically-sealed metal cans placed inside another soldered or hermetically-sealed metal can.

A8.16.2.2. Wooden boxes (4C1, 4C2, 4D, or 4F) with inside water-tight metal cans containing not over .45 kg (1 pound) of phosphorus with screw-top closures.

A8.16.2.3. Steel drums (1A1 or 1A2).1A1 drums must not exceed 250 L (66 gallons), and 1A2 drums must not exceed 114 L (30 gallon) capacity each.

A8.16.3. White Phosphorus Igniters. Pack white phosphorus igniters one each in a hermetically-sealed (soldered) or watertight metal can, sealed airtight and positively fastened. Pack no more than 25 metal cans in a wooden box (4C1, 4C2, 4D, or 4F).

A8.17. Smokeless Powder for Small Arms (100 pounds or less) must be packaged as follows: The PSN "SMOKELESS POWDER FOR SMALL ARMS" is only valid for domestic movement. For international shipment you must use the PSN "POWDER, SMOKELESS" and package the material as required by the packaging paragraph for powder, smokeless. The complete package must be a type examined by the Bureau of Explosives, approved by the DOT, and meet A3.3.1. Not more than 45.4 kg (100 pounds) is allowed on the aircraft. Only combination packaging with inner packagings not exceeding 3.6 kg (8 pounds) net mass are authorized. Arrange and protect inner packagings to prevent simultaneous ignition of the contents.

A8.18. Batteries and Cells Containing Sodium must be packaged as follows: Ensure batteries and cells do not contain any hazardous material other than sodium, sulfur, or polysulfides. Do not offer batteries or cells for transportation at a temperature at which there is any liquid elemental sodium present in the battery or cell. Ensure the external battery temperature does not exceed 55 degrees C (130 degrees F). Ensure batteries are protected from external short circuit.

A8.18.1. Batteries must consist of cells secured within and fully enclosed by a metal casing. Ship unpackaged or in nonspecification protective packagings. UN specification containers are not required.

A8.18.2. Cells must consist of hermetically sealed metal casings that completely enclose the hazardous material. Pack cells with sufficient cushioning material to secure against movement; and to prevent contact between cells and between cells and the internal surfaces of the outer packaging. Pack cells in packaging that meets the PG II performance level. Package in drums or boxes as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), or plastic (1H2) *or* Boxes: ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), or plastic (4H2)

A8.19. Fuel Cell Cartridges.

A8.19.1. The weight of the fuel cells must not exceed 1 kg.

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Not required	Drums: Plywood (1D), Fibre (1G), Plastic (1H2) *or* Jerricans: Plastic (3H2) *or* Boxes: Wood (4C1, 4C2), Plywood (4D), Reconstituted Wood (4F), Fibreboard (4G), Plastic (4H2)

A8.20. Fuel Cells Contained in Equipment

A8.20.1. UN specification packaging is not required. Pack fuel cells in strong outer container. Installed fuel cells in equipment must be protected against short circuit and the entire system must be protected against inadvertent operation. Fuel cell systems must not charge batteries during transport.

A8.20.2. Protect the terminals of the installed fuel cells to prevent short circuit by use of protective coverings, taping, etc.

A8.21. Fuel Cells Packed With Equipment

A8.21.1. UN specification packaging is not required. Pack fuel cells in strong outer container. Fuel cells must be packed in inner packagings or placed in the outer packaging with cushioning material or divider(s) in order to protect against damage that may be caused by the movement or placement of contents within the outer packaging. The maximum number of fuel cell cartridges in the intermediate packaging may not be more than the number required to power the equipment plus two spares.

Attachment 9

CLASS 5--OXIDIZING MATERIALS AND ORGANIC PEROXIDES

A9.1. General Requirements. For military members, failure to obey the mandatory provisions from **paragraphs A9.3** through **A9.10** and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from **paragraph A9.3** through **A9.10** and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and fully comply with the inner/receptacle and outer container selections as specified in each packaging paragraph. Not all packaging paragraphs are inclusive and packaging selection is based on the type of oxidizing materials and organic peroxides shipped. This attachment contains information concerning the packaging and general handling instructions for Class 5.1 (oxidizing material) and Class 5.2 (organic peroxides). See **Attachment 3** for other details concerning Class 5 material.

A9.2. Organic Peroxides Table. The Organic Peroxides Table (refer to 49 CFR §173.225 or appropriate international regulation) specifies, by technical name, the organic peroxides authorized for transportation. An organic peroxide identified by technical name in the organic peroxide table must comply with all of the applicable provisions of the table. An organic peroxide not identified in the organic peroxide table by technical name or a new formulation of identified organic peroxides requires written approval from the DOT according to 49 CFR §173.128 before transportation.

Table A9.1. Organic Peroxides.

ORGANIC PEROXIDES	See 49 CFR §173.225, or appropriate international regulation

A9.3. Class 5.2 Organic Peroxides must be packaged as follows: With the exception of organic peroxide samples, packaging requirements for packaging paragraphs does not specify Class 5.2 organic peroxides. Determine appropriate containers by using **Table A4.1** generic proper shipping names in conjunction with **Table A9.2** or **Table A9.3** Containers selected from **Table A9.2** or **Table A9.3** must pass PG II performance tests and must be UN marked. **Table A9.2** applies to liquid organic peroxides. **Table A9.3** applies to solid organic peroxides. Use **paragraphs A9.3.1** through **A9.3.6** to determine the packaging requirements for organic peroxides.

A9.3.1. Determine the applicable generic PSN.

A9.3.2. Locate the packaging reference (table and item number) for the generic PSN in column 8 of **Table A4.1**. The technical name and associated table or item reference will be listed in lower case letters beneath the generic PSN entry. Select the table or item reference pertaining to the technical name, but use the generic PSN (with technical name in parenthesis) to certify the shipment. The item number is the last number in the packaging reference (i.e., Table A9.2.1. is **Table A9.2**, Item 1). Labels, special provisions, etc., specified for the generic PSN also apply to the technical names listed beneath it.

A9.3.3. Turn to **Table A9.2** or **Table A9.3** as specified by column 8 of **Table A4.1**.

A9.3.4. Locate the quantity nearest to the quantity to be shipped. This number represents the maximum net quantity per package authorized. Lesser item numbers (quantities) may be used instead of the item number specified for the material. Quantities specified for greater item numbers will not be used. For example, if the packaging reference is Table A9.3.4, item number 4 of **Table A9.3** represents the maximum net quantity of the material that can be shipped in one package. However, the lesser quantities listed for item numbers 1-3 could also be used; quantities listed for item numbers 5-8 could not be used for the material because the quantities exceed the maximum net quantity per package permitted for the material.

A9.3.5. Go across the row that contains the quantity to be shipped to identify the appropriate container (including applicable notes). Any container fitting the general container description in the table may be used if it has been tested to a PG II (or PG I) performance level.

A9.3.6. Column 8 of **Table A4.1** specifies the packaging requirements (table and item number) for organic peroxides. **Table A9.2** specifies the type of packagings and the maximum net quantity per package authorized for liquid organic peroxides. **Table A9.3** specifies the type of packaging and the maximum net quantity per package authorized for solid organic peroxides.

Table A9.2. Packaging For Liquid Organic Peroxides.

PACKAGING FOR LIQUID ORGANIC PEROXIDES (See A9.3. for instructions on use of this table.)									
Maximum Quantity or Net Mass Permitted per Container									
TYPE CONTAINERS AND MATERIALS	PKG CODE	A9.2.1	A9.2.2	A9.2.3	A9.2.4	A9.2.5	A9.2.6	A9.2.7	A9.2.8
STEEL DRUM	1A1							60L	225L
STEEL DRUM (1)	1A2							50Kg	200Kg
ALUMINUM DRUM	1B1							60L	225L
FIBER DRUM	1G	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	200Kg
PLASTIC DRUM	1H1	0.5L	0.5L	5L	5L	30L	60L	60L	255L
PLASTIC JERRICAN	3H1	0.5L	0.5L	5L	5L	30L	60L	60L	60L
WOOD BOX (1)	4C1	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	100Kg
PLYWOOD BOX (1)	4D	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	100Kg
FIBERBOARD BOX (1)	4G	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	100Kg
PLASTIC RECEPTACLE WITH OUTER STEEL DRUM	6HA1							60L	225L

PACKAGING FOR LIQUID ORGANIC PEROXIDES (See A9.3. for instructions on use of this table.)									
Maximum Quantity or Net Mass Permitted per Container									
TYPE CONTAINERS AND MATERIALS	PKG CODE	A9.2.1	A9.2.2	A9.2.3	A9.2.4	A9.2.5	A9.2.6	A9.2.7	A9.2.8
PLASTIC RECEPTACLE WITH OUTER ALUMINUM DRUM	6HB1							60L	225L
PLASTIC RECEPTACLE WITH OUTER FIBER DRUM	6HG1	0.5L	0.5L	5L	5L	30L	60L	60L	225L
PLASTIC RECEPTACLE WITH OUTER FIBERBOARD BOX	6HG2	0.5L	0.5L	5L	5L	30L	60L	60L	60L
PLASTIC RECEPTACLE WITH OUTER PLASTIC DRUM	6HH1	0.5L	0.5L	5L	5L	30L	60L	60L	225L
PLASTIC RECEPTACLE WITH OUTER SOLID PLASTIC BOX	6HH2	0.5L	0.5L	5L	5L	30L	60L	60L	60L

NOTES:

1. Packaging only authorized as part of a combination packaging. Inner receptacles must be suitable for liquids.

2. For Items 1 through 6, combination packagings containing organic peroxide type B or C, only plastic bottles, plastic jars, glass bottles, or glass ampoules may be used as inner packagings. However, glass may only be used for inner receptacles for Items 1 and 2.

3. Where two values are given (i.e. .5/10 kg), the first applies to the maximum net quantity per inner receptacle and the second applies to the maximum net quantity of the complete package.

4. If no entry for an item number appears in a specific row, then the type of packaging specified for the row is not authorized for the item number.

Table A9.3. Packaging For Solid Organic Peroxides.

PACKAGING FOR SOLID ORGANIC PEROXIDES (See A9.3. for instructions on use of this table.)
Maximum Quantity or Net Mass Permitted per Container

TYPE CONTAINERS AND MATERIALS	PKG CODE	A.9.3.1	A.9.3.2	A9.3.3	A.9.3.4	A9.3.5	A9.3.6	A9.3.7	A9.3.8
STEEL DRUM	1A2							50Kg	200Kg
ALUMINUM DRUM	1B2							50Kg	200Kg
FIBER DRUM	1G	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	200Kg
PLASTIC DRUM	1H2	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	200Kg
WOOD BOX	4C1	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	100Kg
PLYWOOD BOX	4D	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	100Kg
FIBERBOARD BOX	4G	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	100Kg
PLASTIC RECEPTACLE WITH OUTER STEEL DRUM	6HA1							50Kg	200Kg
PLASTIC RECEPTACLE WITH OUTER ALUMINUM DRUM	6HB1							50Kg	200Kg
PLASTIC RECEPTACLE WITH OUTER FIBER DRUM	6HG1	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	200Kg
PLASTIC RECEPTACLE WITH OUTER FIBERBOARD BOX	6HG2	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	75Kg
PLASTIC RECEPTACLE WITH OUTER PLASTIC DRUM	6HH1	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	200Kg
PLASTIC RECEPTACLE WITH OUTER SOLID PLASTIC BOX	6HH2	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	75Kg

NOTES:

1. For Items 1 through 6, combination packagings containing organic peroxide type B or C, only nonmetallic packagings are authorized. However, glass may only be used for inner receptacles for Items 1 and 2.

2. Where two values are given (i.e. .5/10 kg) the first applies to the maximum net quantity per inner receptacle and the second applies to the maximum net quantity of the complete package.

3. If no entry for an item number appears in a specific row, then the type of packaging in that row is not authorized for that item number.

4. If fire retardant partitions are used, the maximum net weight of the complete package for Item 2 may be 25 kg.

A9.4. Samples of Organic Peroxides must be packaged as follows: Samples of new organic peroxides or new formulations of identified organic peroxides for which complete test data is not available, and which are being transported for testing and evaluation, may be transported and assigned a PSN for organic peroxide, type C. Data available to the person offering the material for transportation must indicate that the sample would pose a threat no greater than that of an organic peroxide, type B, and that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation. Packaging requirements are as follows:

A9.4.1. The sample must be packaged according to **Table A9.2** or **Table A9.3**.

A9.4.2. The maximum quantity must not exceed 10 kg (22 pounds) per shipment.

A9.4.3. The PSN must be organic peroxide type C, liquid; organic peroxide type C, solid; organic peroxide type C, liquid, temperature controlled; or organic peroxide type C, solid, temperature controlled, as applicable.

A9.5. Class 5.1 Liquids must be packaged as follows: See also A3.3.5.

A9.5.1. Package in drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	Drums: steel (1A2), aluminum (1B2), metal drum other than steel or aluminum (1N2), plywood (1D), fiber (1G) or plastic drum (1H2) *or* Barrel: wood (2C2) Note: Wood barrel (2C2) not authorized for PG I material. *or* Jerricans: steel (3A2) or plastic (3H2) *or* Boxes: steel (4A), aluminum (4B), natural (4C1 or 4C2), plywood (4D), or reconstituted (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A9.5.2. Package in drums, barrels, or jerricans as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), or plastic drum (1H1 or 1H2) *or* Barrel: wood (2C1) Note: Wood barrel (2C1) not authorized for PG I material. *or* Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A9.5.3. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, fiber, plastic, or plywood (6HA1, 6HB1, 6HG1, 6HH, or 6HD1) Note: Plywood drums not authorized for PG I material. *or* Box: steel, aluminum, wooden, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A9.5.4. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1) *or* Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2) *or* solid or expanded plastic packaging (6PH1 or 6PH2)

A9.5.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A9.6. Class 5.1 Solids must be packaged as follows: See A3.3.5. for additional packaging requirements.

A9.6.1. Package in drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	Drums: steel (1A2), aluminum (1B2), metal other than steel or aluminum (1N2), plywood (1D), fiber (1G) or plastic (1H2) *or* Barrel: wood (2C2) *or* Jerricans: steel (3A2) or plastic (3H2) *or* Boxes: steel (4A), aluminum (4B), natural (4C1 or 4C2), plywood (4D), or reconstituted (4F), fiberboard (4G), or solid plastic (4H2)

A9.6.2. Package in drums, barrels, jerricans, boxes, or bags as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), metal other than steel or aluminum (1N1 or 1N2), plastic (1H1 or 1H2) or fiber (1G) Note: Plywood drum not authorized for PG I material. *or* Barrel: wood (2C1 or 2C2) Note: Wood barrels not authorized for PG I material. *or* Jerrican: steel (3A1 or 3A2) or plastic (3H1 or 3H2) *or* Boxes: steel (4A), steel with liner (4A), aluminum (4B), aluminum with liner (4B), natural wood (4C1), natural wood, siftproof (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) Note: Steel (4A), aluminum (4B), plywood (4D), reconstituted wood (4F), natural wood (4C1) or fiberboard (4G) boxes not authorized for PG I material. *or* Bags: woven plastic (5H1, 5H2, or 5H3); plastic film (5H4); textile (5L1, 5L2, or 5L3); paper, multiwall, water-resistant (5M2) Note: Bags not authorized for PG I material.

A9.6.3. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH) *or* Boxes: steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A9.6.4. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, plywood, or fiber (6PA1, 6PB1, 6PD1, or 6PG1) *or* Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2) *or* expanded or solid plastic (6PH1 or 6PH2)

A9.7. Iodine Pentafluoride must be packaged as follows: Package in any DOT specification cylinder, except those specified for acetylene.

A9.8. Oxidizing Substances, Solid, Self-Heating, N.O.S.; Oxidizing Substances, Solid, Flammable, N.O.S.; Oxidizing Substances, Solid, Water Reactive, N.O.S. must be packaged as follows: Ship according to a competent authority approval (CAA). See **paragraph 2.5** for more information on CAAs.

A9.9. Bromine Pentafluoride or Bromine Trifluoride must be packaged as follows:

A9.9.1. Handling Instructions. These items are extremely dangerous. Approved chemical safety mask and clothing must be available when handling this material.

A9.9.2. Packaging Requirements. Package bromine pentafluoride or bromine trifluoride in specification cylinders, 3A150, 3AA150, 3B240, 3BN150, 3E1800, 4B240, 4BA240, or 4BW240. Seal each valve outlet by a threaded cap or a threaded plug. No cylinder may be equipped with any pressure relief device. Overpack specification 3E1800 cylinders in a strong wooden box.

A9.10. Oxygen Generators, Chemical. An oxygen generator, chemical may be transported only under the following conditions:

A9.10.1. Approval. A chemical oxygen generator that is shipped with an explosive or non-explosive means of initiation attached must be classed and approved by the Associate Administrator in accordance with the procedures specified in 49 CFR §173.56.

A9.10.2. Impact resistance. A chemical oxygen generator, without any packaging, must be capable of withstanding a 1.8 meter drop onto a rigid, non-resilient, flat and horizontal surface, in the position most likely to cause actuation or loss of contents.

A9.10.3. Protection against inadvertent actuation. A chemical oxygen generator must incorporate one of the following means of preventing inadvertent actuation:

A9.10.3.1. A chemical oxygen generator that is not installed in protective breathing equipment (PBE):

A9.10.3.1.1. Mechanically actuated devices must have two pins, installed so that each is independently capable of preventing the actuator from striking the primer; one pin and one retaining ring, each installed so that each is independently capable of preventing the actuator from striking the primer; or a cover securely installed over the primer and a pin installed so as to prevent the actuator from striking the primer and cover.

A9.10.3.1.2. Electrically actuated devices must have the electrical leads mechanically shorted and the mechanical short must be shielded in metal foil.

A9.10.3.1.3. Devices with a primer but no actuator must have a protective cover over the primer to prevent actuation from external impact.

A9.10.3.2. A chemical oxygen generator installed in a PBE must contain a pin installed so as to prevent the actuator from striking the primer, and be placed in a protective bag, pouch, case or cover such that the protective breathing equipment is fully enclosed in such a manner that the protective bag, pouch, case or cover prevents unintentional actuation of the oxygen generator.

A9.10.4. Packaging. A chemical oxygen generator and a chemical oxygen generator installed in equipment, (e.g., a PBE) must be placed in a rigid outer packaging that conforms to the requirements of either 49 CFR Part 178, Subparts L and M, at the Packing Group I or II performance level; or the performance criteria in Air Transport Association (ATA) Specification No. 300 for a Category I Shipping Container. In addition, with its contents, is capable of meeting the following additional requirements:

A9.10.4.1. The Flame Penetration Resistance Test specified in 49 CFR Part 178, Appendix E.

A9.10.4.2. The Thermal Resistance Test specified in 49 CFR Part 178, Appendix D.

A9.10.5. A chemical oxygen generator is forbidden for transportation by both passenger-carrying and cargo-only aircraft after the manufacturer's expiration date; or after the contents of the generator have been expended.

Attachment 10

CLASS 6-- TOXIC(POISONOUS) MATERIALS AND INFECTIOUS SUBSTANCES

A10.1. General Requirements. For military members, failure to observe the provisions from **paragraphs A10.2** through **A10.10** and any subsequent paragraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to observe the provisions from **paragraph A10.2** through **A10.10** and any subsequent paragraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and fully comply with cylinder specifications and/or inner/receptacle and outer container selection as specified in each packaging paragraph. Not all packaging paragraphs are inclusive and packaging selection is determined by the toxic materials or infectious substances and quantity shipped. This attachment contains information concerning the packaging of Class 6.1 toxic material. The term "toxic" and "poisonous" are used synonymously in this manual. See **Attachment 3** for other details concerning Class 6 material.

A10.2. Packing Group I Class 6.1 Toxic Materials must be packaged as follows:

A10.2.1. Handling Instructions. These items may produce extremely toxic vapors. Approved chemical safety mask and clothing must be available when handling this material. See **paragraph 2.8** for additional requirements.

A10.2.2. Packaging Requirements. Package in DOT specification 3A1800, 3AA1800, 3AL1800, 3D, 3E1800, and 33 cylinders meeting the requirements of A3.3.2. Specification 3A, 3AA, and 3AL cylinders must not exceed 57 kg (125 pounds) water capacity (nominal). Specification 3D and 33 cylinders must not exceed 127 kg (280 pounds) water capacity (nominal). Shipments of arsine or phosphine will not be accepted for transportation if packaged in a specification 3AL cylinder. Cylinders containing phosgene must not exceed a filling density of 125 percent. The cylinder must not contain more than 68 kg (150 pounds) of phosgene. Also, each filled cylinder must be tested for leakage before it is offered for transportation and must show absolutely no leakage. This test must consist of immersing the cylinder and valve, without the protection cap attached, in a bath of water at a temperature of approximately 66 degrees C (150 degrees F) for at least 30 minutes. During which time, frequent examinations must be made to identify any escape of gas. After the test has been accomplished the valve of the cylinder must not be loosened before the cylinder is offered for transportation, and must not be loosened during transportation.

A10.3. Bromoacetone, Methyl Bromide, Chloropicrin, and Methyl Bromide or Methyl Chloride Mixtures must be packaged as follows:

A10.3.1. Handling Instructions. These materials and mixtures are extremely dangerous poisons. Approved chemical safety mask and clothing must be available when handling this material. See **paragraph 2.8** for additional information.

A10.3.2. Packaging Requirements.

A10.3.2.1. Package bromoacetone in a wooden box (4C1, 4C2, 4D, or 4F) with an inner glass receptacle or tube in a hermetically-sealed metal receptacle in a corrugated fiberboard carton. A bottle must not contain over 500 g (17.6 ounces) of liquid and must be cushioned inside the can with at least 12.7 mm (0.5 inch) of absorbent material. The

total amount of liquid in the outer box must not exceed 11 kg (24 pounds). The package must be tested to the PG I performance level.

A10.3.2.2. Package bromoacetone in DOT specification 3A, 3AA, 3B, 3C, 3E, 4A, 4B, 4BA, 4BW, or 4C cylinder with a water capacity (nominal) not exceeding 113 kg (250 pounds). All cylinders must meet the requirements of A3.3.2.

A10.3.2.3. Package methyl bromide, chloropicrin and methyl bromide mixtures, chloropicrin and methyl chloride mixtures, and chloropicrin mixtures charged with nonflammable, nonliquefied compressed gas in DOT specification 3A, 3AA, 3B, 3C, 3E, 4A, 4B, 4BA, 4BW, or 4C cylinder with a water capacity (nominal) not exceeding 113 kg (250 pounds). All cylinders must meet the requirements of A3.3.2.

A10.4. Packaging for Liquid Class 6.1 Materials must be packaged as follows:

A10.4.1. Package in drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, metal, or glass ampoules	Drums: steel (1A2), aluminum (1B2), metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or plastic (1H2) *or* Barrel: wood (2C2) Note: Wood barrels not authorized for PG I material. *or* Jerricans: steel (3A2), aluminum (3B2), or plastic (3H2) *or* Boxes: steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A10.4.2. Package in drums, barrels, or jerricans as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plastic (1H1 or 1H2), or fiber (1G) with liner Note: Fiber drum with liner only authorized for PG III material. *or* Barrel: wood (2C1) Note: Wood barrel not authorized for PG I material. *or* Jerricans: steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A10.4.3. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, fiber, plastic (6HA1, 6HB1, 6HG1, or 6HH1), or plywood (6HD1) Note: Plywood drum (6HD1) not authorized for PG I material. *or* Boxes: steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A10.4.4. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1) *or* Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2) *or* solid or expanded plastic packaging (6PH1 or 6PH2) *or* plywood drum or wickerwork hamper (6PD1 or 6PD2)

A10.4.5. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drum: plywood (6HD1) Note: Not authorized for PG I material.

A10.4.5.1. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A10.5. Solid Class 6.1 Materials must be packaged as follows:

A10.5.1. Package in drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic or metal	Drums: steel (1A2), aluminum (1B2), metal other than steel or aluminum (1N2), plywood drum (1D), fiber (1G), or plastic (1H2) *or* Barrel: wood (2C2) *or* Jerricans: steel (3A2) or plastic (3H2) *or* Boxes: steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic (4H2)

A10.5.2. Package in drums, barrels, jerricans, boxes, or bags as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), plastic (1H1 or 1H2), or fiber drum (1G) Note: Plywood drum (1D) not authorized for PG I material. *or* Barrel: wood (2C1 or 2C2). Note: Wood barrels (2C1 or 2C2) not authorized for PG I material. *or* Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2) *or* Boxes: steel with liner (4A), aluminum with liner (4B), natural wood sift-proof (4C2) Boxes (not authorized for PG I material): steel (4A), aluminum (4B), plywood (4D), reconstituted wood (4F), natural wood (4C1), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) *or* Bags: woven plastic (5H1, 5H2, or 5H3), plastic film (5H4), textile (5L1, 5L2, or 5L3), or paper, multiwall, water-resistant (5M2) Note: Bags not authorized for PG I material.

A10.5.3. Package in the following composite packages:

Inner receptacle	Outer packaging

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) *or* Boxes: steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A10.5.4. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, plywood, or fiber drum (6PA1, 6PB1, 6PD1, or 6PG1) *or* Boxes: steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2) *or* expanded or solid plastic packaging (6PH1 or 6PH2)

A10.6. Class 6.1, PG I, Hazard Zone A and B (Poisonous by Inhalation) must be packaged as follows:

A10.6.1. Handling Instructions. These items are extremely dangerous. Approved chemical safety mask and clothing must be available when handling this material.

A10.6.2. Packaging Requirements. Package Class 6.1, PG I materials with an Inhalation Hazard (Hazard Zone A and B) as follows:

A10.6.2.1. In seamless DOT or UN specification cylinders that conform to 49 CFR §173.40 and one of the specifications for cylinders in 49 CFR Part 178, Subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of A3.3.2.

A10.6.2.2. In an inner drum (1A1, 1B1, 1H1, 1N1 , or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. An outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). An outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum must not exceed 220 L (58 gallons). The outer drum (1A2 or 1H2) must withstand a hydrostatic test pressure of 100kPa (15 psi). Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material which completely surrounds the inner packaging on all sides. The inner drum must also meet the following requirements:

A10.6.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR §178.605) of 300 kPa (45 psig).

A10.6.2.2.2. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR §178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A10.6.2.2.3. Have screw-type closures that meet all the following requirements:

A10.6.2.2.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A10.6.2.2.3.2. Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation.

A10.6.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A10.6.2.2.4. Meet the following minimum thickness requirements:

A10.6.2.2.4.1. 1A1 and 1N1 drums must have a minimum thickness of 1.3 mm (0.051 inches).

A10.6.2.2.4.2. 1B1 drums must have a minimum thickness of 3.9 mm (0.154 inches).

A10.6.2.2.4.3. 1H1 drums must have a minimum thickness of 3.16 mm (0.124 inches).

A10.6.2.2.4.4. 6HA1 drums the plastic inner container must have a minimum thickness of 1.58 mm (0.0622 inches) and the outer steel drum must have a minimum thickness of 0.96 mm (0.0378 inches).

A10.6.2.3. Pack in combination packagings with an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal, securely cushioned with a nonreactive absorbent material packed within a leak-tight packaging of metal or plastic. The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure must have a closure that is held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation. Pack the inner packaging system in an outer steel drum (1A2), aluminum drum (1B2), metal drum (other than steel or aluminum (1N2)), plywood drum (1D), fiber drum (1G), plastic drum (1H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2). Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A10.6.2.4. Pack in a metal drum (1A1, 1B1, or 1N1), plastic drum (1H1), or composite drum (6HA1 or 6HH1), then placed in a metal drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum must not exceed 220 L (58 gallons). The outer drum (1A2 or 1H2) must withstand a hydrostatic test pressure of 100kPa (15 psi). This package is only authorized for Class 6.1, PG I, Hazard Zone B material. Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material which completely surrounds the inner packaging on all sides. The inner drum must also meet the following requirements:

A10.6.2.4.1. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR §178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A10.6.2.4.2. Have screw-type closures that are:

A10.6.2.4.2.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A10.6.2.4.2.2. Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation.

A10.6.2.4.2.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A10.6.2.4.3. Meet the following minimum thickness requirements:

A10.6.2.4.3.1. 1A1 drums must have a minimum thickness of 0.69 mm (0.027 inches). 1B1 drums must have a minimum thickness of 2.79 mm (0.110 inches). 1H1 drums must have a minimum thickness of 1.14 mm (0.045 inches). 6HA1 drums must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.70 mm (0.027 inches) for the outer steel drum.

A10.7. Tear Gas Candles must be packaged as follows: Any newly developed packaging must be approved by the DOT before initial transportation from the manufacturer. Package tear gas candles, tear gas grenades, and similar devices (with more than 2 percent tear gas substance by mass).

A10.7.1. Pack in a metal-strapped natural wood box (4C1 or 4C2), metal-strapped plywood box (4D), or metal-strapped reconstituted wood box (4F). Functioning elements not assembled in grenades or devices must be packed in a separate compartment within the box, packed in inner boxes, then placed inside the outer box, or packed in a separate outside wooden (4C1, 4C2, 4D, or 4F) box. Pack and cushion the elements so they cannot come into contact with each other or in contact with the walls of the box during transportation. No more than 50 items and 50 functioning elements can be packed in one outer container. The gross weight of the outer container must not exceed 35 kg (77 pounds). Tear gas devices can be shipped completely assembled provided the functioning elements are packed so that they cannot accidentally function. Package items completely assembled as specified in this paragraph.

A10.7.2. Pack in steel drum (1A2.) Pack functioning elements in a separate inner packaging or separate compartment. Pack no more than 24 items and 24 functioning elements in one outer drum. The gross weight of the outer container must not exceed 35 kg (77 pounds).

A10.7.3. DOT 2P and 2Q. Pack in inner containers meeting the DOT 2P or 2Q specification (inside nonrefillable metal containers), then packaged in a fiberboard box (4G). Place each inside container into fiberboard tubes with metal ends or a fiberboard box with suitable padding. Pack no more than 30 inner packagings in one outer fiberboard box. The gross weight must not exceed 16 kg (35 pounds).

A10.8. Infectious Substances (Etiologic Agent) and Genetically Modified Microorganisms must be packaged as follows:

A10.8.1. Handling Instructions.

A10.8.1.1. Infectious Substance, Affecting Humans, UN2814. This material has the potential to cause disease in humans.

A10.8.1.2. Infectious Substance, Affecting Animals, UN2900. This material has the potential to cause disease in animals.

A10.8.1.3. Damaged Packages. Do not handle if package is leaking or damaged. Notify technical escorts, Biological Personnel Reliability Program (BPRP) personnel escorting the sample or medical personnel. Person(s) responsible for the carriage of packages containing infectious substances must: (1) avoid handling the package or keep handling to a minimum; (2) inspect adjacent packages for contamination and put aside any that may have been contaminated; (3) notify the shipper and/or the receiver that the package has leaked. Upon discovering damage to the package, which indicates damage to the primary container, the carrier must isolate the container and notify the Director, Center for Disease Control and Prevention, U.S. Public Health Service, 1600 Clifton Road NE, Atlanta GA 30333 (telephone number (800) 232-0124), and the shipper.

A10.8.2. The following requirements apply to all shipments of Category A and Category B (in cultures) infectious substances, and genetically modified microorganisms:

A10.8.2.1. Use inner packagings that consist of a leakproof primary receptacle, then place in a leakproof secondary packaging.

A10.8.2.2. Place absorbent material between the primary receptacle and the secondary packaging. If multiple primary receptacles are placed in a single secondary packaging they must be separated with enough absorbent material to make sure there is no contact between the primary receptacles. There must be sufficient absorbent material to absorb the entire contents of all primary receptacles.

A10.8.2.3. This inner packaging must then be placed in a rigid outer packaging.

A10.8.2.4. Each package for infectious substances must be capable of passing the tests specified in 49 CFR §178.609.

A10.8.2.5. Each package must be at least 100 mm (3.9 inches) in the smallest overall external dimensions.

A10.8.2.6. Each package of infectious substances must have an itemized list of the contents enclosed between the secondary packaging and the outer packaging.

A10.8.2.7. For packages containing material that is unknown but suspected of meeting the criteria for inclusion in Category A and assignment to UN2814 or UN2900, the words “Suspected Category A Infectious Substance” must be shown in parenthesis following the PSN on the itemized list of contents inside the outer package.

A10.8.2.8. Whatever the intended temperature of shipment, the primary receptacle or the secondary packaging used for infectious substances must be capable of withstanding without leakage an internal pressure (which produces a pressure differential) of not less than 95 kPa (14 psi). Also, the primary receptacle and the secondary packaging must be

capable of withstanding temperatures of -40 degrees C to +55 degrees C (-40 degrees F to +131 degrees F).

A10.8.2.9. In addition to the requirements of this paragraph, personnel must also meet the requirements for biological select agents and toxins in the 42 CFR Part 73 (Department of Health and Human Services); 7 CFR Part 331 and 9 CFR Part 121 (Department of Agriculture); and all applicable Department of Defense regulations.

A10.8.2.10. Personnel transporting infectious substances, genetically modified microorganisms, or associated biological material must make advanced arrangements to ensure that all necessary permits are obtained prior to transport and that transport of the samples and specimens occurs without delay of delivery.

A10.8.3. In addition to the requirements identified above, package infectious substances, genetically modified microorganisms, and genetically modified organisms as specified below. Exceptional cases, such as whole organs, may require special packaging. Guidance for packaging material that requires temperature control during shipment is contained in DLAI 4145.21/TB MED 284/NAVSUPINST 4610.31/AFJI 41-208, "Preparation of Medical Materiel Requiring Freeze or Chill Environment for Shipment."

A10.8.3.1. Lyophilized substances. Primary receptacles must be flame-sealed glass ampoules or rubber stopped glass vials fitted with metal seals.

A10.8.3.2. Liquid or solid substances shipped at ambient temperatures or higher. Primary receptacles must be glass, metal, or plastic. Provide a positive means of ensuring a leak proof seal, such as a heat seal, skirted stopper, or metal crimp seal. If screw caps are used, they must be reinforced with adhesive tape.

A10.8.3.3. Liquid or solid substances shipped refrigerated or frozen (ice, prefrozen packs, or dry ice.) Place ice or dry ice outside the secondary packagings. Provide interior supports to secure the secondary packagings in their original position after the ice or dry ice has dissipated. If ice is used, the outer packaging must be leak proof. If dry ice is used, the outer packaging must permit the release of carbon dioxide gas.

A10.8.3.4. Liquid or solid substances shipped in liquid nitrogen. Primary receptacles must be plastic, capable of withstanding very low temperatures. The secondary packaging must also withstand very low temperatures and in most cases will need to be fitted over individual primary receptacles. All requirements for shipment of liquid nitrogen must also be met.

A10.8.4. Damaged Packages. Upon discovering damage to the package, which indicates damage to the primary container, the carrier must isolate the container and notify the Director, Center for Disease Control and Prevention, U.S. Public Health Service, 1600 Clifton Road NE, Atlanta GA 30333 (telephone number (800) 232-0124), and the shipper.

A10.9. Biological Substances, Category B, (formerly Diagnostic Specimens) must be packaged as follows:

A10.9.1. Except as listed below, Biological Substances, Category B (includes patient/diagnostic specimens containing or believed to contain Biological Substances, Category B) are exempted from all other requirements of this manual (to include a Shipper's Declaration For Dangerous Goods) when offered for transportation or transported in

accordance with this paragraph. A patient/diagnostic specimen meeting the definition of a patient specimen (see **Attachment 1**), and not containing or believed to contain infectious substance Category A or Category B is not regulated by this manual. A patient/diagnostic specimen meeting the definition of a hazard class must be transported as required for that class. The following requirements apply to Biological Substances, Category B:

A10.9.1.1. Use packaging consisting of a primary receptacle, a secondary packaging, and a rigid outer packaging.

A10.9.1.2. The primary receptacles must be packed in secondary packaging in such a way that, under normal conditions of transport, it cannot break, be punctured, or leak the contents into the secondary packaging.

A10.9.1.3. Secondary packagings must be secured in outer rigid packagings with suitable cushioning material such that any leakage of the contents will not impair the protective properties of the cushioning material or the outer packaging.

A10.9.1.4. Completed package must be capable of successfully passing the drop test in 49 CFR §178.603 at a drop height of at least 1.2 meters (3.9 feet).

A10.9.1.5. The outer packaging must be clearly and durably marked with the words "Biological Substance, Category B" in letters at least 6mm high and must be marked adjacent to " UN3373" (see **paragraph A14.4.5.3**).

A10.9.2. Liquid Biological Substances, Category B. Liquid Biological Substances, Category B must be packaged as follows:

A10.9.2.1. The primary receptacle must be leakproof with a volumetric capacity of not more than 1 L (33.8 ounces).

A10.9.2.2. Place absorbent material between the primary receptacle and secondary packaging. If several fragile primary receptacles are placed in a single secondary packaging, they must be individually wrapped or separated so as to prevent contact between them. The absorbent material must be of sufficient quantity to absorb the entire contents of the primary receptacles.

A10.9.2.3. The secondary packaging must be leakproof.

A10.9.2.4. The primary receptacle or the secondary packaging must be capable of withstanding without leakage an internal pressure producing a pressure differential of not less than 95 kPa (0.95 bar, 14 psi) in the range of -40 degrees C to 55 degrees C (-40 degrees F to 130 degrees F).

A10.9.2.5. The outer packaging must not exceed 4 L (1 gallon) capacity.

A10.9.3. Solid Biological Substances, Category B. Solid Biological Substances, Category B must be packaged as follows:

A10.9.3.1. The primary receptacle must be siftproof and must not exceed the outer packaging weight limit.

A10.9.3.2. The secondary packaging must be siftproof.

A10.9.3.3. If several fragile primary receptacles are placed in a single secondary packaging, they must be individually wrapped or separated so as to prevent contact between them.

A10.9.3.4. Except for packages containing body parts, organs, or whole bodies, the outer packaging must not exceed 4 kg (8.8 pounds). This quantity excludes ice, dry ice, or liquid nitrogen, when used to ship specimens cold.

A10.9.3.5. If there is the possibility of residual liquid in the primary receptacle during transport, then a packaging suitable for liquids, including absorbent material, must be used.

A10.9.4. Refrigerated or Frozen Specimens. The following applies:

A10.9.4.1. Liquid or solid substances shipped refrigerated or frozen (ice, prefrozen packs, or dry ice.) Place ice or dry ice outside the secondary packagings. Provide interior supports to secure the secondary packagings in their original position after the ice or dry ice has dissipated. If ice is used, the outer packaging must be leak proof. If dry ice is used, the outer packaging must permit the release of carbon dioxide gas.

A10.9.4.2. Liquid or solid substances shipped in liquid nitrogen. Primary receptacles must be plastic, capable of withstanding very low temperatures. The secondary packaging must also withstand very low temperatures and in most cases will need to be fitted over individual primary receptacles. All requirements for shipment of liquid nitrogen must also be met.

A10.10. Regulated Medical Waste, N.O.S; Biomedical Waste, N.O.S.; Clinical Waste, Unspecified, N.O.S.; Medical Waste, N.O.S. must be packaged as follows: Use non bulk packagings that meet the PG II performance level. Additionally, ensure the packaging is:

A10.10.1. Rigid, leak resistant, and impervious to moisture.

A10.10.2. Of sufficient strength to prevent tearing or bursting under normal conditions of handling and use.

A10.10.3. Sealed to prevent leakage during transport.

A10.10.4. Puncture-resistant for sharps and sharps with residual fluids as demonstrated by meeting the performance tests in 49 CFR Part 178, Subpart M, break-resistant, and tightly lidded for fluids in quantities greater than 20 cubic centimeters.

A10.11. Chlorosilanes must be packaged as follows: Packaging must meet the PG I or PG II performance standards.

A10.11.1. Package in the following combination drums, or boxes:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Receptacles: glass, or steel	Drums: steel (1A2), plywood (1D), fiber (1G), or plastic (1H2) *or* Boxes: steel (4A), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)

A10.11.2. Package in the following composite drums:

Inner receptacle	Outer packaging
Plastic	Drums: steel drum (6HA1)

A10.11.3. Package in the following single drums, or jerricans:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1) *or* Jerricans: steel (3A1)

A10.11.4. Package in Cylinders as prescribed for any compressed gas, except Specification 8, 3HT, and aluminum cylinders.

Attachment 11

CLASS 7--RADIOACTIVE MATERIALS

A11.1. General Requirements. For military members, failure to obey the mandatory provisions from **paragraphs A11.2** through **A11.12** and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from **paragraph A11.2** through **A11.12** and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and must comply with the outer container options as specified in packaging paragraph. Not all packaging paragraphs are inclusive and packaging selection is determined by the type of radioactive material. This attachment contains information concerning the packaging and general handling instructions for Class 7 (Radioactive Material). See **Attachment 3** for other details concerning Class 7 material.

A11.2. Activity Limits for Type A and Type B Packages:

A11.2.1. A Type A package must not contain a quantity of radioactivity greater than A_1 (for special form radioactive material) or A_2 for all other radioactive materials as listed in A11.4. Activity limits not listed in A11.4. are determined per 49 CFR §173.431.

A11.2.2. The limits on activity contained in a Type B(U) or Type B(M) package are those prescribed in A11.9. and A11.10. or in the applicable approval certificate in accordance with 49 CFR §173.471, §173.472 or §173.473.

A11.3. Determining A1 and A2 Values for Radionuclides:

A11.3.1. For single radionuclides of known identity, the values of A_1 and A_2 are those given in A11.4. The values of A_1 and A_2 are also applicable for radionuclides contained in (a,n) or (h,n) neutron sources.

A11.3.2. For any single radionuclide of known identity, that is not listed in A11.4., the values of A_1 and A_2 must be determined according to 49 CFR §173.433.

A11.4. **Table A11.1** This table gives A_1 and A_2 values for radionuclides. This table also gives values on exempt material activity concentrations and exempt consignment activity limits for radionuclides. The information in this table is taken from 49 CFR §173.435 and §173.436.

Table A11.1. Table of A1 and A2 Values for Common Radionuclides.

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Ac-225[a]	Actinium (89)	0.8	0.006	1×10^{1}	1×10^{4}
Ac-227[a]		0.9	0.00009	1×10^{-1}	1×10^{3}
Ac-228		0.6	0.5	1×10^{1}	1×10^{6}
Ag-105	Silver (47)	2	2	1×10^{2}	1×10^{6}
Ag-108m[a]		0.7	0.7	1×10^{1b}	1×10^{6b}
Ag-110m[a]		0.4	0.4	1×10^{1}	1×10^{6}
Ag-111		2	0.6	1×10^{3}	1×10^{6}

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Al-26	Aluminum (13)	0.1	0.1	1×10^{1}	1×10^{5}
Am-241	Americium (95)	10	0.001	1×10^{0}	1×10^{4}
Am-242m[a]		10	0.001	1×10^{0}[b]	1×10^{4}[b]
Am-243[a]		5	0.001	1×10^{0}[b]	1×10^{3}[b]
Ar-37	Argon (18)	40	40	1×10^{6}	1×10^{8}
Ar-39		40	20	1×10^{7}	1×10^{4}
Ar-41		0.3	0.3	1×10^{2}	1×10^{9}
As-72	Arsenic (33)	0.3	0.3	1×10^{1}	1×10^{5}
As-73		40	40	1×10^{3}	1×10^{7}
As-74		1	0.9	1×10^{1}	1×10^{6}
As-76		0.3	0.3	1×10^{2}	1×10^{5}
As-77		20	0.7	1×10^{3}	1×10^{6}
At-211	Astatine (85)	20	0.5	1×10^{3}	1×10^{7}
Au-193	Gold (79)	7	2	1×10^{2}	1×10^{7}
Au-194		1	1	1×10^{1}	1×10^{6}
Au-195		10	6	1×10^{2}	1×10^{7}
Au-198		1	0.6	1×10^{2}	1×10^{6}
Au-199		10	0.6	1×10^{2}	1×10^{6}
Ba-131[a]	Barium (56)	2	2	1×10^{2}	1×10^{6}
Ba-133		3	3	1×10^{2}	1×10^{6}
Ba-133m		20	0.6	1×10^{2}	1×10^{6}
Ba-140[a]		0.5	0.3	1×10^{1}[b]	1×10^{5}[b]
Be-7	Beryllium (4)	20	20	1×10^{3}	1×10^{7}
Be-10		40	0.6	1×10^{4}	1×10^{6}
Bi-205	Bismuth (83)	0.7	0.7	1×10^{1}	1×10^{6}
Bi-206		0.3	0.3	1×10^{1}	1×10^{5}
Bi-207		0.7	0.7	1×10^{1}	1×10^{6}
Bi-210		1	0.6	1×10^{3}	1×10^{6}
Bi-210m[a]		0.6	0.02	1×10^{1}	1×10^{5}
Bi-212[a]		0.7	0.6	1×10^{1}[b]	1×10^{5}[b]
Bk-247	Berkelium (97)	8	0.0008	1×10^{0}	1×10^{4}
Bk-249[a]		40	0.3	1×10^{3}	1×10^{6}
Br-76	Bromine (35)	0.4	0.4	1×10^{1}	1×10^{5}
Br-77		3	3	1×10^{2}	1×10^{6}
Br-82		0.4	0.4	1×10^{1}	1×10^{6}
C-11	Carbon (6)	1	0.6	1×10^{1}	1×10^{6}
C-14		40	3	1×10^{4}	1×10^{7}
Ca-41	Calcium (20)	Unlimited	Unlimited	1×10^{5}	1×10^{7}
Ca-45		40	1	1×10^{4}	1×10^{7}
Ca-47[a]		3	0.3	1×10^{1}	1×10^{6}
Cd-109	Cadmium (48)	30	2	1×10^{4}	1×10^{6}
Cd-113m		40	0.5	1×10^{3}	1×10^{6}
Cd-115[a]		3	0.4	1×10^{2}	1×10^{6}

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Cd-115m		0.5	0.5	1×10^3	1×10^6
Ce-139	Cerium (58)	7	2	1×10^2	1×10^6
Ce-141		20	0.6	1×10^2	1×10^7
Ce-143		0.9	0.6	1×10^2	1×10^6
Ce-144[a]		0.2	0.2	1×10^{2}[b]	1×10^{5}[b]
Cf-248	Californium (98)	40	0.006	1×10^1	1×10^4
Cf-249		3	0.0008	1×10^0	1×10^3
Cf-250		20	0.002	1×10^1	1×10^4
Cf-251		7	0.0007	1×10^0	1×10^3
Cf-252		0.1	0.003	1×10^1	1×10^4
Cf-253[a]		40	0.04	1×10^2	1×10^5
Cf-254		0.001	0.001	1×10^0	1×10^3
Cl-36	Chlorine (17)	10	0.6	1×10^4	1×10^6
Cl-38		0.2	0.2	1×10^1	1×10^5
Cm-240	Curium (96)	40	0.02	1×10^2	1×10^5
Cm-241		2	1	1×10^2	1×10^6
Cm-242		40	0.01	1×10^2	1×10^5
Cm-243		9	0.001	1×10^0	1×10^4
Cm-244		20	0.002	1×10^1	1×10^4
Cm-245		9	0.0009	1×10^0	1×10^3
Cm-246		9	0.0009	1×10^0	1×10^3
Cm-247[a]		3	0.001	1×10^0	1×10^4
Cm-248		0.02	0.0003	1×10^0	1×10^3
Co-55	Cobalt (27)	0.5	0.5	1×10^1	1×10^6
Co-56		0.3	0.3	1×10^1	1×10^5
Co-57		10	10	1×10^2	1×10^6
Co-58m		40	40	1×10^4	1×10^7
Co-58		1	1	1×10^1	1×10^6
Co-60		0.4	0.4	1×10^1	1×10^5
Cr-51	Chromium (24)	30	30	1×10^3	1×10^7
Cs-129	Cesium (55)	4	4	1×10^2	1×10^5
Cs-131		30	30	1×10^3	1×10^6
Cs-132		1	1	1×10^3	1×10^6
Cs-134		0.7	0.7	1×10^1	1×10^4
Cs-134m		40	0.6	1×10^3	1×10^5
Cs-135		40	1	1×10^4	1×10^7
Cs-136		0.5	0.5	1×10^1	1×10^5
Cs-137[a]		2	0.6	1×10^{1}[b]	1×10^{4}[b]
Cu-64	Copper (29)	6	1	1×10^2	1×10^6
Cu-67		10	0.7	1×10^2	1×10^6
Dy-159	Dysprosium (66)	20	20	1×10^3	1×10^7
Dy-165		0.9	0.6	1×10^3	1×10^6
Dy-166[a]		0.9	0.3	1×10^3	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Er-169	Erbium (68)	40	1	1×10^4	1×10^7
Er-171		0.8	0.5	1×10^2	1×10^6
Eu-147	Europium (63)	2	2	1×10^2	1×10^6
Eu-148		0.5	0.5	1×10^1	1×10^6
Eu-149		20	20	1×10^2	1×10^7
Eu-150 (short lived)		2	0.7	1×10^3	1×10^6
Eu-150 (long lived)		0.7	0.7	1×10^1	1×10^6
Eu-152		1	1	1×10^1	1×10^6
Eu-152m		0.8	0.8	1×10^2	1×10^6
Eu-154		0.9	0.6	1×10^1	1×10^6
Eu-155		20	3	1×10^2	1×10^7
Eu-156		0.7	0.7	1×10^1	1×10^6
F-18	Fluorine (9)	1	0.6	1×10^1	1×10^6
Fe-52[a]	Iron (26)	0.3	0.3	1×10^1	1×10^6
Fe-55		40	40	1×10^4	1×10^6
Fe-59		0.9	0.9	1×10^1	1×10^6
Fe-60[a]		40	0.2	1×10^2	1×10^5
Ga-67	Gallium (31)	7	3	1×10^2	1×10^6
Ga-68		0.5	0.5	1×10^1	1×10^5
Ga-72		0.4	0.4	1×10^1	1×10^5
Gd-146[a]	Gadolinium (64)	0.5	0.5	1×10^1	1×10^6
Gd-148		20	0.002	1×10^1	1×10^4
Gd-153		10	9	1×10^2	1×10^7
Gd-159		3	0.6	1×10^3	1×10^6
Ge-68[a]	Germanium (32)	0.5	0.5	1×10^1	1×10^5
Ge-71		40	40	1×10^4	1×10^8
Ge-77		0.3	0.3	1×10^1	1×10^5
Hf-172[a]	Hafnium (72)	0.6	0.6	1×10^1	1×10^6
Hf-175		3	3	1×10^2	1×10^6
Hf-181		2	0.5	1×10^1	1×10^6
Hf-182		Unlimited	Unlimited	1×10^2	1×10^6
Hg-194[a]	Mercury (80)	1	1	1×10^1	1×10^6
Hg-195m[a]		3	0.7	1×10^2	1×10^6
Hg-197m		10	0.4	1×10^2	1×10^6
Hg-197		20	10	1×10^2	1×10^7
Hg-203		5	1	1×10^2	1×10^5
Ho-166	Holmium (67)	0.4	0.4	1×10^3	1×10^5
Ho-166m		0.6	0.5	1×10^1	1×10^6
I-123	Iodine (53)	6	3	1×10^2	1×10^7
I-124		1	1	1×10^1	1×10^6
I-125		20	3	1×10^3	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
I-126		2	1	1×10^2	1×10^6
I-129		Unlimited	Unlimited	1×10^2	1×10^5
I-131		3	0.7	1×10^2	1×10^6
I-132		0.4	0.4	1×10^1	1×10^5
I-133		0.7	0.6	1×10^1	1×10^6
I-134		0.3	0.3	1×10^1	1×10^5
I-135[a]		0.6	0.6	1×10^1	1×10^6
In-111	Indium (49)	3	3	1×10^2	1×10^6
In-113m		4	2	1×10^2	1×10^6
In-114m[a]		10	0.5	1×10^2	1×10^6
In-115m		7	1	1×10^2	1×10^6
Ir-189[a]	Iridium (77)	10	10	1×10^2	1×10^7
Ir-190		0.7	0.7	1×10^1	1×10^6
Ir-192		1[c]	0.6	1×10^1	1×10^4
Ir-194		0.3	0.3	1×10^2	1×10^5
K-40	Potassium (19)	0.9	0.9	1×10^2	1×10^6
K-42		0.2	0.2	1×10^2	1×10^6
K-43		0.7	0.6	1×10^1	1×10^6
Kr-81	Krypton (36)	40	40	1×10^4	1×10^7
Kr-85m		8	3	1×10^3	1×10^{10}
Kr-85		10	10	1×10^5	1×10^4
Kr-87		0.2	0.2	1×10^2	1×10^9
La-137	Lanthanum (57)	30	6	1×10^3	1×10^7
La-140		0.4	0.4	1×10^1	1×10^5
LSA		Note 4	Note 4		
Lu-172	Lutetium (71)	0.6	0.6	1×10^1	1×10^6
Lu-173		8	8	1×10^2	1×10^7
Lu-174m		20	10	1×10^2	1×10^7
Lu-174		9	9	1×10^2	1×10^7
Lu-177		30	0.7	1×10^3	1×10^7
MFP	Mixed Fission Products	Note 3	Note 3		
Mg-28[a]	Magnesium (12)	0.3	0.3	1×10^1	1×10^5
Mn-52	Manganese (25)	0.3	0.3	1×10^1	1×10^5
Mn-53		Unlimited	Unlimited	1×10^4	1×10^9
Mn-54		1	1	1×10^1	1×10^6
Mn-56		0.3	0.3	1×10^1	1×10^5
Mo-93	Molybdenum (42)	40	20	1×10^3	1×10^8
Mo-99[a]		1	0.6	1×10^2	1×10^6
N-13	Nitrogen (7)	0.9	0.6	1×10^2	1×10^9
Na-22	Sodium (11)	0.5	0.5	1×10^1	1×10^6
Na-24		0.2	0.2	1×10^1	1×10^5
Nb-93m	Niobium (41)	40	30	1×10^4	1×10^7

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Nb-94		0.7	0.7	1×10^1	1×10^6
Nb-95		1	1	1×10^1	1×10^6
Nb-97		0.9	0.6	1×10^1	1×10^6
Nd-147	Neodymium (60)	6	0.6	1×10^2	1×10^6
Nd-149		0.6	0.5	1×10^2	1×10^6
Ni-59	Nickel (28)	Unlimited	Unlimited	1×10^4	1×10^8
Ni-63		40	30	1×10^5	1×10^8
Ni-65		0.4	0.4	1×10^1	1×10^6
Np-235	Neptunium (93)	40	40	1×10^3	1×10^7
Np-236 (short lived)		20	2	1×10^3	1×10^7
Np-236 (long lived)		9	0.02	1×10^2	1×10^5
Np-237		20	0.002	1×10^{0}[b]	1×10^{3}[b]
Np-239		7	0.4	1×10^2	1×10^7
Os-185	Osmium (76)	1	1	1×10^1	1×10^6
Os-191m		40	30	1×10^3	1×10^7
Os-191		10	2	1×10^2	1×10^7
Os-193		2	0.6	1×10^2	1×10^6
Os-194[a]		0.3	0.3	1×10^2	1×10^5
P-32	Phosphorus (15)	0.5	0.5	1×10^3	1×10^5
P-33		40	1	1×10^5	1×10^8
Pa-230[a]	Protactinium (91)	2	0.07	1×10^1	1×10^6
Pa-231		4	0.0004	1×10^0	1×10^3
Pa-233		5	0.7	1×10^2	1×10^7
Pb-201	Lead (82)	1	1	1×10^1	1×10^6
Pb-202		40	20	1×10^3	1×10^6
Pb-203		4	3	1×10^2	1×10^6
Pb-205		Unlimited	Unlimited	1×10^4	1×10^7
Pb-210[a]		1	0.05	1×10^{1}[b]	1×10^{4}[b]
Pb-212 [a]		0.7	0.2	1×10^{1}[b]	1×10^{5}[b]
Pd-103	Palladium (46)	40	40	1×10^3	1×10^8
Pd-107		Unlimited	Unlimited	1×10^5	1×10^8
Pd-109		2	0.5	1×10^3	1×10^6
Pm-143	Promethium (61)	3	3	1×10^2	1×10^6
Pm-144		0.7	0.7	1×10^1	1×10^6
Pm-145		30	10	1×10^3	1×10^7
Pm-147		40	2	1×10^4	1×10^7
Pm-148m[a]		0.8	0.7	1×10^1	1×10^6
Pm-149		2	0.6	1×10^3	1×10^6
Pm-151		2	0.6	1×10^2	1×10^6
Po-210	Polonium (84)	40	0.02	1×10^1	1×10^4

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Pr-142	Praseodymium (59)	0.4	0.4	1×10^2	1×10^5
Pr-143		3	0.6	1×10^4	1×10^6
Pt-188[a]	Platinum (78)	1	0.8	1×10^1	1×10^6
Pt-191		4	3	1×10^2	1×10^6
Pt-193m		40	0.5	1×10^3	1×10^7
Pt-193		40	40	1×10^4	1×10^7
Pt-195m		10	0.5	1×10^2	1×10^6
Pt-197m		10	0.6	1×10^2	1×10^6
Pt-197		20	0.6	1×10^3	1×10^6
Pu-236	Plutonium (94)	30	0.003	1×10^1	1×10^4
Pu-237		20	20	1×10^3	1×10^7
Pu-238		10	0.001	1×10^0	1×10^4
Pu-239		10	0.001	1×10^0	1×10^4
Pu-240		10	0.001	1×10^0	1×10^3
Pu-241[a]		40	0.06	1×10^2	1×10^5
Pu-242		10	0.001	1×10^0	1×10^4
Pu-244[a]		0.4	0.001	1×10^0	1×10^4
Ra-223[a]	Radium (88)	0.4	0.007	1×10^{2b}	1×10^{5b}
Ra-224 [a]		0.4	0.02	1×10^{1b}	1×10^{5b}
Ra-225 [a]		0.2	0.004	1×10^2	1×10^5
Ra-226 [a]		0.2	0.003	1×10^{1b}	1×10^{4b}
Ra-228 [a]		0.6	0.02	1×10^{1b}	1×10^{5b}
Rb-81	Rubidium (37)	2	0.8	1×10^1	1×10^6
Rb-83[a]		2	2	1×10^2	1×10^6
Rb-84		1	1	1×10^1	1×10^6
Rb-86		0.5	0.5	1×10^2	1×10^5
Rb-87		Unlimited	Unlimited	1×10^4	1×10^7
Rb (natural)		Unlimited	Unlimited	1×10^4	1×10^7
Re-184	Rhenium (75)	1	1	1×10^1	1×10^6
Re-184m		3	1	1×10^2	1×10^6
Re-186		2	0.6	1×10^3	1×10^6
Re-187		Unlimited	unlimited	1×10^6	1×10^9
Re-188		0.4	0.4	1×10^2	1×10^5
Re-189[a]		3	0.6	1×10^2	1×10^6
Re (natural)		Unlimited	Unlimited	1×10^6	1×10^9
Rh-99	Rhodium (45)	2	2	1×10^1	1×10^6
Rh-101		4	3	1×10^2	1×10^7
Rh-102		0.5	0.5	1×10^1	1×10^6
Rh-102m		2	2	1×10^2	1×10^6
Rh-103m		40	40	1×10^4	1×10^8
Rh-105		10	0.8	1×10^2	1×10^7
Rn-222[a]	Radon (86)	0.3	0.004	1×10^{1b}	1×10^{8b}

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Ru-97	Ruthenium (44)	5	5	1×10^2	1×10^7
Ru-103[a]		2	2	1×10^2	1×10^6
Ru-105		1	0.6	1×10^1	1×10^6
Ru-106 [a]		0.2	0.2	1×10^{2}[b]	1×10^{5}[b]
S-35	Sulphur (16)	40	3	1×10^5	1×10^8
Sb-122	Antimony (51)	0.4	0.4	1×10^2	1×10^4
Sb-124		0.6	0.6	1×10^1	1×10^6
Sb-125		2	1	1×10^2	1×10^6
Sb-126		0.4	0.4	1×10^1	1×10^5
Sc-44	Scandium (21)	0.5	0.5	1×10^1	1×10^5
Sc-46		0.5	0.5	1×10^1	1×10^6
Sc-47		10	0.7	1×10^2	1×10^6
Sc-48		0.3	0.3	1×10^1	1×10^5
SCO		Note 5	Note 5		
Se-75	Selenium (34)	3	3	1×10^2	1×10^6
Se-79		40	2	1×10^4	1×10^7
Si-31	Silicon (14)	0.6	0.6	1×10^3	1×10^6
Si-32		40	0.5	1×10^3	1×10^6
Sm-145	Samarium (62)	10	10	1×10^2	1×10^7
Sm-147		Unlimited	Unlimited	1×10^1	1×10^4
Sm-151		40	10	1×10^4	1×10^8
Sm-153		9	0.6	1×10^2	1×10^6
Sn-113[a]	Tin (50)	4	2	1×10^3	1×10^7
Sn117m		7	0.4	1×10^2	1×10^6
Sn-119m		40	30	1×10^3	1×10^7
Sn-121m[a]		40	0.9	1×10^3	1×10^7
Sn-123		0.8	0.6	1×10^3	1×10^6
Sn-125		0.4	0.4	1×10^2	1×10^5
Sn-126[a]		0.6	0.4	1×10^1	1×10^5
Sr-82[a]	Strontium (38)	0.2	0.2	1×10^1	1×10^5
Sr-85m		5	5	1×10^2	1×10^7
Sr-85		2	2	1×10^2	1×10^6
Sr-87m		3	3	1×10^2	1×10^6
Sr-89		0.6	0.6	1×10^3	1×10^6
Sr-90[a]		0.3	0.3	1×10^{2}[b]	1×10^{4}[b]
Sr-91[a]		0.3	0.3	1×10^1	1×10^5
Sr-92[a]		1	0.3	1×10^1	1×10^6
T (All Forms) (see note)	Tritium (1)	40	40	1×10^6	1×10^9
Ta-178 (long lived)	Tantalum (73)	1	0.8	1×10^1	1×10^6
Ta-179		30	30	1×10^3	1×10^7
Ta-182		0.9	0.5	1×10^1	1×10^4
Tb-157	Terbium (65)	40	40	1×10^4	1×10^7

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Tb-158		1	1	1×10^1	1×10^6
Tb-160		1	0.6	1×10^1	1×10^6
Tc-95m [a]	Technetium (43)	2	2	1×10^1	1×10^6
Tc-96m [a]		0.4	0.4	1×10^3	1×10^7
Tc-96		0.4	0.4	1×10^1	1×10^6
Tc-97m		40	1	1×10^3	1×10^7
Tc-97		Unlimited	Unlimited	1×10^3	1×10^8
Tc-98		0.8	0.7	1×10^1	1×10^6
Tc-99m		10	4	1×10^2	1×10^7
Tc-99		40	0.9	1×10^4	1×10^7
Te-121m	Tellurium (52)	5	3	1×10^2	1×10^5
Te-121		2	2	1×10^1	1×10^6
Te-123m		8	1	1×10^2	1×10^7
Te-125m		20	0.9	1×10^3	1×10^7
Te-127m[a]		20	0.5	1×10^3	1×10^7
Te-127		20	0.7	1×10^3	1×10^6
Te-129m[a]		0.8	0.4	1×10^3	1×10^6
Te-129		0.7	0.6	1×10^2	1×10^6
Te-131m[a]		0.7	0.5	1×10^1	1×10^6
Te-132[a]		0.5	0.4	1×10^2	1×10^7
Th-227	Thorium (90)	10	0.005	1×10^1	1×10^4
Th-228[a]		0.5	0.001	1×10^{0b}	1×10^{4b}
Th-229		5	0.0005	1×10^{0b}	1×10^{3b}
Th-230		10	0.001	1×10^0	1×10^4
Th-231		40	0.02	1×10^3	1×10^7
Th-232		Unlimited	Unlimited	1×10^1	1×10^4
Th-234[a]		0.3	0.3	1×10^{3b}	1×10^{5b}
Th (natural)		Unlimited	Unlimited	1×10^{0b}	1×10^{3b}
Ti-44[a]	Titanium (22)	0.5	0.4	1×10^1	1×10^5
Tl-200	Thallium (81)	0.9	0.9	1×10^1	1×10^6
Tl-201		10	4	1×10^2	1×10^6
Tl-202		2	2	1×10^2	1×10^6
Tl-204		10	0.7	1×10^4	1×10^4
Tm-167	Thulium (69)	7	0.8	1×10^2	1×10^6
Tm-170		3	0.6	1×10^3	1×10^6
Tm-171		40	40	1×10^4	1×10^8
U-230 (fast lung absorption)[a, d]	Uranium (92)	40	0.1	1×10^{1b}	1×10^{5b}
U-230 (medium lung absorption)[a, e]		40	0.004	1×10^1	1×10^4
U-230 (slow lung absorption)[a, f]		30	0.003	1×10^1	1×10^4

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
U-232 (fast lung absorption)[d]		40	0.01	1×10^{0}[b]	1×10^{3}[b]
U-232 (medium lung absorption)[e]		40	0.007	1×10^{1}	1×10^{4}
U-232 (slow lung absorption)[f]		10	0.001	1×10^{1}	1×10^{4}
U-233 (fast lung absorption)[d]		40	0.09	1×10^{1}	1×10^{4}
U-233 (medium lung absorption)[e]		40	0.02	1×10^{2}	1×10^{5}
U-233 (slow lung absorption)[f]		40	0.006	1×10^{1}	1×10^{5}
U-234 (fast lung absorption) [d]		40	0.09	1×10^{1}	1×10^{4}
U-234 (medium lung absorption)[e, f]		40	0.02	1×10^{2}	1×10^{5}
U-234 (slow lung absorption)[f]		40	0.006	1×10^{1}	1×10^{5}
U-235 (all lung absorption types) [a, d, e, f]		Unlimited	Unlimited	1×10^{1}[b]	1×10^{4}[b]
U-236 (fast lung absorption) [d]		Unlimited	Unlimited	1×10^{1}	1×10^{4}
U-236 (medium lung absorption)[e]		40	0.02	1×10^{2}	1×10^{5}
U-236 (slow lung absorption)[f]		40	0.006	1×10^{1}	1×10^{4}
U-238(all lung absorption types)[d, e, f]		Unlimited	Unlimited	1×10^{1}[b]	1×10^{4}[b]
U (natural)		Unlimited	Unlimited	1×10^{0}[b]	1×10^{3}[b]
U (enriched 20% or less)[g]		Unlimited	Unlimited	1×10^{0}	1×10^{3}
U (depleted)		Unlimited	Unlimited	1×10^{0}	1×10^{3}
V-48	Vanadium (23)	0.4	0.4	1×10^{1}	1×10^{5}
V-49		40	40	1×10^{4}	1×10^{7}
W-178	Tungsten (74)	9	5	1×10^{1}	1×10^{6}
W-181		30	30	1×10^{3}	1×10^{7}
W-185		40	0.8	1×10^{4}	1×10^{7}
W-187		2	0.6	1×10^{2}	1×10^{6}
W-188[a]		0.4	0.3	1×10^{2}	1×10^{5}
Xe-122[a]	Xenon (54)	0.4	0.4	1×10^{2}	1×10^{9}
Xe-123		2	0.7	1×10^{2}	1×10^{9}
Xe-127		4	2	1×10^{3}	1×10^{5}
Xe-131m		40	40	1×10^{4}	1×10^{4}

Symbol	Element and Atomic Number	A_1 (TBq) (Special Form)	A_2 (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Xe-133		20	10	1×10^3	1×10^4
Xe-135		3	2	1×10^3	1×10^{10}
Y-87[a]	Yttrium (39)	1	1	1×10^1	1×10^6
Y-88		0.4	0.4	1×10^1	1×10^6
Y-90		0.3	0.3	1×10^3	1×10^5
Y-91m		2	2	1×10^2	1×10^6
Y-91		0.6	0.6	1×10^3	1×10^6
Y-92		0.2	0.2	1×10^2	1×10^5
Y-93		0.3	0.3	1×10^2	1×10^5
Yb-169	Ytterbium (70)	4	1	1×10^2	1×10^7
Yb-175		30	0.9	1×10^3	1×10^7
Zn-65	Zinc (30)	2	2	1×10^1	1×10^6
Zn-69m		3	0.6	1×10^2	1×10^6
Zn-69		3	0.6	1×10^4	1×10^6
Zr-88	Zirconium (40)	3	3	1×10^2	1×10^6
Zr-93		Unlimited	Unlimited	1×10^{3b}	1×10^{7b}
Zr-95[a]		2	0.8	1×10^1	1×10^6
Zr-97[a]		0.4	0.4	1×10^{1b}	1×10^{5b}

NOTES:

[a] A_1 and/or A_2 values include contributions from daughter nuclides with half-lives less than 10 days.

[b] Parent nuclides and their progeny included in secular equilibrium are listed in the following:

Sr-90 --- Y-90

Zr-93 --- Nb-93m

Zr-97 --- Nb-97

Ru-106 --- Rh-106

Cs-137 --- Ba-137m

Ce-134 --- La-134

Ce-144 --- Pr-144

Ba-140 --- La-140

Bi-212 --- Tl-208 (0.36), Po-212 (0.64)

Pb-210 --- Bi-210, Po-210

Pb-212 --- Bi-212, Tl-208 (0.36), Po-212 (0.64)

Rn-220 --- Po-216

Rn-222 --- Po-218, Pb-214, Bi-214, Po-214

Ra-223 --- Rn-219, Po-215, Pb-211, Bi-211, Tl-207

Ra-224 --- Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Ra-226 --- Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210

Ra-228 --- Ac-228

Th-226 --- Ra-222, Rn-218, Po-214

Th-228 --- Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Th-229 --- Ra-225, Ac-225, Fr-221, At-217, Bi-213, Po-213, Pb-209

Th-nat - Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Th-234 --- Pa-234m

U-230 --- Th-226, Ra-222, Rn-218, Po-214

U-232 --- Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

U-235 --- Th-231

U-238 --- Th-234, Pa-234m

U-nat --- Th-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210

U-240 --- Np-240m

Np-237--- Pa-233

Am-242m --- Am-242

Am-243 --- Np-239

[c] The quantity may be determined from a measurement of the rate of decay or a measurement of the radiation level at a prescribed distance from the source.

[d] These values apply only to compounds of uranium that take the chemical form of UF_6, $U0_2F_2$ and $UO_2(NO_3)_2$ in both normal and accident conditions of transport.

[e] These values apply only to compounds of uranium that take the chemical form of $U0_3$, UF_4, UCI_4 and hexavalent compounds in both normal and accident conditions of transport.

[f] These values apply to all compounds of uranium other than those specified in (d) and (e) above.

[g] These values apply to unirradiated uranium only.

1. In Table A11.1, the symbols for the various radionuclides are styled thus "Ir-192". The alternative form of "192 Ir" is equally acceptable.

2. Tritium (T) is a synonym for the radionuclide Hydrogen-3.

3. For Mixed Fission Products values for A_1 and A_2 are calculated using the formula for mixtures found in 49 CFR §173.433(h).

4. For Low Specific Activity (LSA) material, consult IATA, section 10.3.5.

5. For Surface Contaminated Objects (SCO) consult IATA, section 10.3.6.

6. Type A packages must not contain activities greater than the following values: for special form radioactive material: A_1; or for all other radioactive materials: A_2.

A11.5. Excepted Packages. An Excepted Package is a packaging used for containing radioactive material, that is designed to meet the general packaging requirements of A3.3.7. as applicable.

A11.5.1. General Requirements. Radioactive materials in limited quantities, instruments, manufactured articles, and empty packagings may be transported as excepted packages, provided that:

A11.5.1.1. The radiation level at any point on the external surface of the package is not over 5 µSv/h (0.5 mrem/h).

A11.5.1.2. The nonfixed (removable) radioactive surface contamination on the external surface of the package is not over the limits specified in A3.3.7.6.

A11.5.2. Exceptions.

A11.5.2.1. Excepted packages are subject to the following:

A11.5.2.1.1. Package marking requirements in A14.4.6.2.

A11.5.2.1.2. Reporting accidents/incidents.

A11.5.2.1.3. The materials are packaged in strong, tight packages that will not leak any of the radioactive materials under normal transportation conditions. Packaging must meet the general requirements of A3.3.7.8.

A11.5.2.2. Excepted packages are not subject to the following:

A11.5.2.2.1. Specification Packaging.

A11.5.2.2.2. Marking requirements (except A14.4.6.2.).

A11.5.2.2.3. Labeling requirements.

A11.5.2.2.4. Shipper's Declaration for Dangerous Goods requirements.

A11.5.3. Other Hazards. For excepted packages of radioactive materials possessing any other dangerous characteristics, the other hazard takes precedence. Therefore, the package is subject to the Regulations relevant to the other hazard.

A11.5.4. Radioactive Materials in Limited Quantities. Radioactive material whose activities do not exceed the relevant exception limits listed in the column headed "Materials – Package Limits" in **Table A11.2** may be transported in an excepted package, provided that:

A11.5.4.1. These materials are packaged in such a manner that, in conditions likely to be encountered during routine transport (incident-free conditions), there can be no leakage of radioactive material from the package.

A11.5.4.2. The package bears the marking "RADIOACTIVE" on an internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package.

A11.5.5. Instruments and Manufactured Articles. Instruments and manufactured articles (including clocks, electronic tubes, or apparatus) or similar devices having radioactive

materials in gaseous or nondispersible solid form as a component part may be transported in an excepted package if:

A11.5.5.1. Each package meets the general requirements of A3.3.7.8.

A11.5.5.2. The activity of the instrument or article is not over the applicable limit listed in **Table A11.2**.

A11.5.5.3. The total activity per package is not over the applicable limit listed in **Table A11.2**.

A11.5.5.4. The active material is completely enclosed by a nonactive component.

A11.5.5.5. The radiation level at 10 cm (4 inches) from any point on the external surface of any unpackaged instrument or article is not over 0.1 mSv/h (10 mrem/h). The radiation level at any point on the external surface of a package bearing the article or instrument does not exceed 0.005 mSv/hour (0.5 mrem/hour), or, for exclusive use domestic shipments, 0.02 mSv/hour (2 mrem/hour).

A11.5.5.6. Each instrument or article is marked "RADIOACTIVE" except:

A11.5.5.6.1. Radioluminescent time-pieces or devices. ***Note:*** Some radioluminescent devices require marking as radioactive IAW 10 CFR.

A11.5.5.6.2. Consumer products that either have received regulatory approval, following their sale to the end user or do not individually exceed the activity limit for an exempt consignment in **Table A11.1** provided such products are transported in a package that bears the marking "RADIOACTIVE" on an internal surface in such a manner that warning of the presence of radioactive material is visible upon opening the package.

A11.5.5.7. The active material is completely enclosed by non-active components (a device performing the sole function of containing radioactive material must not be considered to be an instrument or manufactured article).

Table A11.2. Activity Limits for Limited Quantities Instruments and Articles.

Nature of Contents	Materials	Instruments and	Articles
	Package Limits (Note 1)	Limits for each instrument and article (Note 1)	Package Limits (Note 1)
Solids			
Special Form	10^{-3} A_1	10^{-2} A_1	A_1
Other Form	10^{-3} A_2	10^{-2} A_2	A_2
Liquids			
Tritiated Water:			
<0.0037 TBq/liter (0.1 Ci/L)	37 TBq (1000 Ci)		
0.0037 TBq to 0.037 TBq/L (0.1 Ci to 1.0 Ci/L)	3.7 TBq (100 Ci)		
>0.037 TBq/L (1.0 Ci/L)	0.037 TBq (1 Ci)		
Other Liquids	10^{-4} A_2	10^{-3} A_2	10^{-1} A_2

Gases			
Tritium (Note 2)	2×10^{-2} A_2	2×10^{-2} A_2	2×10^{-1} A_2
Special Form	10^{-3} A_1	10^{-3} A_1	10^{-2} A_1
Other Forms	10^{-3} A_2	10^{-3} A_2	10^{-2} A_2

NOTES:

1. For mixture of radionuclides see 49 CFR §173.433(d).

2. These values also apply to tritium in activated luminous paint and tritium absorbed on solid carriers.

A11.5.6. Articles Manufactured from Natural Uranium, Depleted Uranium, or Natural Thorium. Manufactured articles, in which the sole radioactive material is unirradiated natural uranium, unirradiated depleted uranium, or unirradiated natural thorium, may be transported as an excepted package, provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

A11.5.7. Empty Packages. An empty packaging which had previously contained radioactive material may be transported as an excepted package if the following conditions are met:

A11.5.7.1. It is in a well-maintained condition and securely closed.

A11.5.7.2. The outer surface of any uranium or thorium in its structure is covered with an active sheath made of metal or some other substantial material.

A11.5.7.3. The level of internal non-fixed contamination does not exceed one hundred times the levels specified in A3.3.7.6. for an excepted package.

A11.5.7.4. Hazardous materials labels used on the package previously are removed or no longer visible.

A11.5.8. Activity Limit Per Package.

A11.5.8.1. Excepted Package of Radioactive Material. For radioactive material other than articles manufactured of natural uranium, or natural thorium, an excepted package must not contain activities greater than the following:

A11.5.8.1.1. Where the radioactive material is enclosed in, or forms a component part of an instrument or other manufactured article, such as a clock or electronic apparatus, the limits specified in A11.5.5. for each individual item and each package respectively.

A11.5.8.1.2. Where the radioactive material is not so enclosed in or is not included as a component of an instrument or other manufactured article, the limits specified in A11.5.4.

A11.5.8.2. Manufactured Articles. For articles manufactured of natural uranium, depleted uranium, or natural thorium, an excepted package may contain any quantity of such material provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

A11.6. Industrial Packaging. Industrial Packaging may be used for Low Specific Activity (LSA) material and Surface Contaminated Objects (SCO). LSA and SCO materials must not be transported unpackaged.

A11.6.1. Activity Limit. The total activity in a single package of LSA material or in a single package of SCO must be so restricted that the radiation level specified in A11.6.5. is not exceeded, and the activity in a single package must also be so restricted that the activity limits for an aircraft specified in **Table A11.3** are not exceeded. A single package of non-combustible solid LSA-II or LSA-III material shall not contain an activity greater than 3,000 A_2.

Table A11.3. Aircraft Activity Limits for LSA Material and SCO in Industrial Packages.

Nature of Material	Activity Limit Per Aircraft
LSA-I	No Limit
LSA-II and LSA-III non-combustible solids	No Limit
LSA-II and LSA-III combustible solids, and all liquids and gases	100 A_2
SCO	100 A_2

A11.6.2. Industrial Package Type 1. A packaging or freight container containing LSA material or SCO that is designed to meet the requirements of 49 CFR §173.411 is an Industrial Package Type 1 (Type IP-1).

A11.6.3. Industrial Package Type 2. A packaging or freight container containing LSA material or SCO that is designed to meet the requirements of 49 CFR §173.411 is an Industrial Package Type 2.

A11.6.4. Industrial Package, Type 3. A packaging or freight container containing LSA material or SCO that is designed to meet the requirements of 49 CFR §173.411 is an Industrial Package Type 3.

A11.6.5. LSA and SCO Quantity Limit. The quantity of LSA material or SCO in a single Industrial Package Type 1, Industrial Package Type 2, or Industrial Package Type 3 must be so restricted that the external radiation level at 3m (10 ft) from the unshielded material does not exceed 10 mSv/h (1 rem/h).

A11.6.6. LSA and SCO – Fissile. LSA material and SCO which is, or contains, fissile material, must meet the applicable requirements of either 49 CFR §173.457 or 10 CFR PART 71.

A11.6.7. LSA and SCO – Restrictions. Packages and Freight containers containing LSA material or SCO must meet the requirements of A3.3.7.6. and A3.3.7.18. LSA material in group LSA-I and SCO in group SCO-I must not be transported unpackaged.

A11.6.8. LSA and SCO – Integrity Limits. LSA material and SCO must be packaged in accordance with **Table A11.4**.

Table A11.4. Industrial Package Integrity Requirements for LSA and SCO.

Contents	Industrial Package Type	
	Exclusive Use	NOT Under Exclusive Use

Contents	Industrial Package Type	
	Exclusive Use	NOT Under Exclusive Use
LSA-I:		
Solid	Type 1	Type 1
Liquid	Type 1	Type 2
LSA-II		
Solid	Type 2	Type 2
Liquid and gas	Type 2	Type 3
LSA-III	Type 2	Type 3
SCO-I	Type 1	Type 1
SCO-II	Type 2	Type 2

A11.7. Packages Containing Uranium Hexafluoride(fissile, fissile excepted, and nonfissile). The mass of uranium hexafluoride in a package shall not have a value that would lead to a ullage smaller than 5% at the maximum temperature of the package as specified for the plant systems where the package shall be used. The uranium hexafluoride shall be in solid form and the internal pressure of the package shall be below atmospheric pressure when presented for transport. Prepare this material for military air shipment according to 49 CFR §173.420.

A11.8. Authorized Type A Packages. Use the following packages for shipment, if they do not contain quantities over A_1 or A_2 as appropriate:

A11.8.1. DOT 7A packaging. DOT 7A packaging designed according to the requirements of 49 CFR §178.350 in effect after 30 June 1983.

A11.8.2. Any Type A packaging authorized in 49 CFR §173.415.

A11.8.3. For fissile material, any Type A packaging that meets the applicable standards for fissile materials in 10 CFR Part 71 and authorized in 49 CFR §173.471.

A11.8.4. Type B, B(U), or B(M) Packaging. Any Type B, B(U), or B(M) packaging, authorized in A11.9.2.1. or A11.9.2.2.

A11.8.5. Foreign-Made Packaging. Any foreign-made packaging that meets the standards of IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1*" and bears the marking "Type A" used for the import of radioactive materials. The packaging must conform to the requirements of the country of origin (as indicated by the packaging marking) and the IAEA regulations applicable to Type A packaging.

A11.9. Type B Packages.

A11.9.1. Activity Limits. Type B(U) and B(M) must not contain activities greater than the following:

A11.9.1.1. Low dispersible material - as authorized for the package design.

A11.9.1.2. Special Form Radioactive Material – 3,000 A_1 or 100,000 A_2, whichever is lower.

A11.9.1.3. All other radioactive material – 3,000 A2.

A11.9.2. Authorized Packages. Use the following packages for shipment of quantities over A_1 or A_2, as appropriate:

A11.9.2.1. Any Type B, Type B(U), or Type B(M) packaging that meets the applicable requirements in 10 CFR Part 71 and has been approved by the US Nuclear Regulatory Commission may be shipped per 49 CFR §173.471.

A11.9.2.2. Any Type B, B(U) or B(M) packaging that meets the applicable requirements of the regulations of the IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by DOT according to 49 CFR §173.473. Authorized only for export and import shipments.

A11.10. Authorized Packaging-Fissile Materials.

A11.10.1. Except as provided in A3.3.7.3.4.1., package fissile materials containing not more than A_1 or A_2 (as appropriate) in:

A11.10.1.1. Any packaging listed in A11.8., limited to radioactive materials specified in 10 CFR Part 71, Subpart C.

A11.10.1.2. Any other Type AF, Type BF, Type B(U)F, or Type B(M)F packaging for fissile radioactive materials that also meets the applicable standards for fissile materials in 10 CFR Part 71.

A11.10.1.3. Any other Type AF, Type B(U)F, or Type B(M)F packaging that also meets the applicable requirements for fissile material packaging in section VI of the IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by the DOT according to 49 CFR §173.473. Authorized only for export and import shipments.

A11.10.1.4. Any metal cylinder that meets the performance requirements of A11.5. and 49 CFR §178.350 for DOT 7A Type A packaging may be used for the transport of residual "heels" of enriched solid uranium hexafluoride without a protective overpack per **Table A11.3**.

A11.10.1.5. DOT 20PF-1, 20PF-2, 20PF-3 or 21PF-1A, 21PF-1B, or 21PF-2 phenolic-foam insulated overpacks with snug fitting inner metal cylinders meeting all of the applicable requirements of A3.3.7.9., A3.3.7.10., and the following:

A11.10.1.5.1. Handling procedures and packaging criteria must comply with US Enrichment Corporation Report Number USEC-651 or ANSI N14.1.

A11.10.1.5.2. Quantities of uranium hexafluoride are authorized as shown in **Table A11.5**, with each package assigned a minimum transport index as also shown.

Table A11.5. Allowable Content of Uranium Hexafluoride (UF6) "Heels" in a Specification 7A Cylinder.

Maximum Cylinder Diameter	Cylinder Volume	Maximum Uranium 235 Enrichment (Weight %)	Maximum "Heel" Weight Per Cylinder UF_6 Uranium ^{235}

Inches	Centimeters	Cubic Feet	L		kg	(lb)	kg	(lb)
5	12.7	0.311	8.8	100.0	0.045	0.1	0.031	0.07
8	20.3	1.359	39	12.5	0.227	0.5	.019	0.04
12	30.5	2.410	68	5.0	0.454	1.0	.015	0.03
30	76	25.64	725	5.0	11.3	25	.383	0.84
48	122	108.9	3084	4.5	22.7	50	.690	1.52
		(10 ton)						
48	122	142.7	4041	4.5	22.7	50	.690	1.52
		(14 ton)						

A11.10.2. Fissile Radioactive Materials with Radioactive Content Over A1 or A2. Package in either:

A11.10.2.1. Type B(U) or B(M) packaging that meets the standards for packaging of fissile materials in 10 CFR Part 71, and is approved by the US Nuclear Regulatory Commission per 49 CFR §173.471.

A11.10.2.2. Type B(U) or B(M) packaging that meets the applicable requirements for fissile radioactive materials in section VI of the IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by the DOT according to 49 CFR §173.473. Authorized only for export and import shipments.

A11.10.2.3. DOT 20PF-1, 20PF-2, 20PF-3, 21PF-1A, or 21PF-1B phenolic-foam insulated overpacks with snug fitting inner metal cylinders meeting all of the applicable requirements of A3.3.7.9., A3.3.7.10., and the following:

A11.10.2.3.1. Handling procedures and packaging criteria must comply with US Enrichment Corporation Report Number USEC-651 or ANSI Standard N14.1.

A11.10.2.3.2. Quantities of uranium hexafluoride are authorized as shown in **Table A11.6**, with each package assigned a minimum transport index as also shown.

Table A11.6. Authorized Quantities of Uranium Hexafluoride (UF6) as Fissile Class II.

	Maximum Inner Cylinder Diameter		Maximum Weight of UF_6 Contents			
Protective Overpack Specification Number	Centimeter	Inch	Kilograms	Pounds	Maximum U^{235} Enrichment (weight %)	Minimum Transport Index

	Maximum Inner Cylinder Diameter		Maximum Weight of UF_6 Contents			
Protective Overpack Specification Number	Centimeter	Inch	Kilograms	Pounds	Maximum U^{235} Enrichment (weight %)	Minimum Transport Index
20PF-1 20PF-2 20PF-3	12.7 20.3 30.5	5 8 12	25 116 209	55 255 460	100.0 12.5 5.0	0.1 0.4 1.1
21PF-1A or 21PF-1B (Note 1)	76 (Note 2)	30 (Note 2)	2,250	4,950	5.0	5.0
21PF-1A or 21PF-1B (Note 1)	76 (Note 3)	30 (Note 3)	2,282	5,020	5.0	5.0
21PF-2 (Notes 1)	76 (Note 2)	30 (Note 2)	2,250	4,950	5.0	5.0
21PF-2 (Note 1)	76 (Note 3)	30 (Note 3)	2,282	5,020	5.0	5.0

NOTES:

1. For 76 cm cylinders, the maximum permitted H/U atomic ratio is 0.088.
2. Model 30A inner cylinder (reference: USEC-651).
3. Model 30B inner cylinder (reference: USEC-651).

A11.11. Special Arrangement (Competent Authority Approval). If the radioactive material does not comply with any of the methods of packing provided in this manual, the material may be permitted to be transported by CAA. The provisions for carrying the radioactive material using a CAA must be approved by all countries concerned. These provisions must be adequate to ensure that the overall level of safety in transport and in-transit storage is at least equivalent to the level of safety which would be provided if all the applicable requirements of these regulations had been met. Each consignment must have multilateral approval.

A11.12. Authorized Packaging-Pyrophoric Radioactive Materials. Package pyrophoric radioactive materials in quantities not over A_2 per package in DOT Type 7A packagings constructed of materials that do not react nor be decomposed by the contents. Contents must be:

A11.12.1. In solid form and must not be fissile unless excepted by A3.3.7.3.4.2.

A11.12.2. Contained in sealed and corrosion resistant receptacles with positive closures (friction or slip-fit covers or stoppers are not authorized).

A11.12.3. Free of water and any contaminants that increase the reactivity of the material.

A11.12.4. Made inert to prevent self-ignition during transport by either:

A11.12.4.1. Mixing with large volumes of inerting materials such as graphite or dry sand, or other suitable inerting material, or blended into a matrix of hardened concrete.

A11.12.4.2. Filling the innermost receptacle with an appropriate inert gas or liquid.

A11.12.4.3. Pyrophoric Class 7 (Radioactive) materials transported by aircraft must be packaged in Type B packages.

Attachment 12

CLASS 8--CORROSIVE MATERIALS

A12.1. General Requirements. For military members, failure to obey the mandatory provisions from **paragraphs A12.2** through **A12.14** and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from **paragraph A12.2** through **A12.14** and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and fully comply with the inner/receptacle packaging and outer container selection as mandated in packaging paragraph. Not all packaging paragraphs are inclusive and packaging selection is determined by the type of corrosive material and quantity shipped. This attachment contains information concerning the packaging and general handling instructions for Class 8 (corrosive materials). See **Attachment 3** for other details concerning Class 8 material.

A12.2. Liquid Class 8 Materials must be packaged as follows:

A12.2.1. Package in drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Drums: steel (1A2), aluminum (1B2), metal other than steel or aluminum (1N2), plywood (1D), fiber (1G) or plastic (1H1 or 1H2) *or* Barrel: wood (2C2) Note: Wood barrel (2C2) not authorized for PG I material. *or* Jerricans: steel (3A2), aluminum (3B1 or 3B2) or plastic (3H1 or 3H2) *or* Boxes: steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A12.2.2. Package in drums, barrels, or jerricans as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plastic (1H1 or 1H2) or fiber (1G) with liner Note: Fiber drum (1G) with liner only authorized for PG III material. *or* Barrel: wood (2C1) Note: Wood barrel (2C1) not authorized for PG I material. *or* Jerricans: steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A12.2.3. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: Steel, aluminum, fiber, plastic, or plywood (6HA1, 6HB1, 6HG1, 6HH1, or 6HD1) Note: Plywood drums not authorized for PG I material. *or* Boxes: steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A12.2.4. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum or fiber (6PA1, 6PB1, or 6PG1) *or* Boxes: steel, aluminum, wooden or fiberboard (6PA2, 6PB2, 6PC, or 6PG2) *or* solid or expanded plastic packaging (6PH1 or 6PH2)

A12.2.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A12.2.6. DS2. Package as described below.

A12.2.6.1. Wooden box (4C1) or fiberboard box (4G) with inside original 1.3 L (1 1/3 quart) capacity containers. Arrange in snugly fitting cells not more than 12 per box. Place full box size pads against all inside faces of the box. Maximum gross weight is 45.4 kg (100 pounds).

A12.2.6.2. Wooden box (4C1) or fiberboard box (4G) with an inside 19 L (5 gallon) metal drum. Overpack DS2 containers that are not in good condition in metal drums. Cushion the cans with a minimum of 76 mm (3 inches) of vermiculite on all sides.

A12.3. Solid Class 8 Materials must be packaged as follows:

A12.3.1. Package in drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Drums: steel (1A2), aluminum (1B2), metal other than steel or aluminum (1N2), plywood (1D), fiber (1G) or plastic (1H2) *or* Barrel: wood (2C2) *or* Jerricans: steel (3A2), aluminum (3B2), or plastic (3H2) *or* Boxes: steel (4A), aluminum (4B), Natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic box (4H2)

A12.3.2. Package in drums, barrels, jerricans, boxes, or bags as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), plastic (1H1 or 1H2) or fiber (1G) Note: Plywood (1D) is not authorized for PG I material. *or* Barrel: wood (2C1 or 2C2) Note: Wood barrels (2C1 or 2C2) not authorized for PG I material. *or* Jerricans: steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) *or* Boxes: steel with liner (4A), aluminum with liner (4B), steel (4A1), aluminum (4B1), natural wood sift-proof (4C2), plywood (4D), reconstituted wood (4F), natural wood (4C1), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) Note: Steel (4A1), aluminum (4B1), natural wood (4C1), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) boxes are not authorized for PG I material. *or* Bags: woven plastic (5H1, 5H2, or 5H3); plastic film (5H4); textile (5L1, 5L2, or 5L3); or paper, multiwall, water-resistant (5M2) Note: Bags are not authorized for PG 1 material.

A12.3.3. Package in the following composite packages:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) *or* Boxes: steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A12.3.4. Package in the following composite packages:

Inner receptacle	Outer packaging

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, plywood, or fiber (6PA1, 6PB1, 6PD1, or 6PG1) *or* Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2) *or* expanded or solid plastic packaging (6PH1 or 6PH2)

A12.4. Batteries, Wet, Filled with Acid; Batteries, Wet, Filled with Alkali; or Batteries, Wet, Non-spillable must be packaged as follows:

A12.4.1. The following applies:

A12.4.1.1. Completely protect against short circuit and securely cushion electric storage batteries containing electrolyte acid or alkali corrosive battery fluid within the outer container.

A12.4.1.2. Place batteries inside an acid or alkali-proof liner (not mandatory for non-spillable batteries), adequately sealed to prevent leakage in the event of a spill, within the outer container.

A12.4.1.3. Pack batteries so that the fill openings or vents, if any, are upward.

A12.4.1.4. Do not pack with other articles unless authorized by a specific packaging paragraph.

A12.4.1.5. However, batteries may be packed with portable searchlights, battery parts, or hydrometers, if properly cushioned and securely packed in a separate container.

A12.4.2. Batteries Packed without other materials must be packaged in boxes, drums, or jerricans as follows:

Inner packaging	Outer packaging
Not required	Boxes: wooden (4C1, 4C2, 4D, 4F), fiberboard (4G), or solid plastic (4H2) *or* Drums: plywood (1D), fiber (1G), or plastic (1H2) *or* Jerrican: plastic (3H2) Note: All outer packagings must meet PG II performance standards.

A12.4.3. Non-Spillable Batteries. Pack in strong outer packagings. To consider a battery non-spillable, it must withstand without leakage the vibration and pressure differential tests specified in 49 CFR §173.159(d). Batteries meeting the additional requirement of Special Provision A67 are considered dry, and are not subject to any other requirements of this manual.

A12.4.4. Electrolyte, Acid, or Alkali Corrosive Battery Fluid, Packed with Storage Batteries Wet or Dry. Package as described below.

A12.4.4.1. Package in boxes as follows:

Inner packaging	Outer packaging
Glass receptacles Note: Not over 1.0 L (1 quart) capacity each.	Boxes: wooden box (4C1, 4C2, 4D, 4F) Note: Maximum quantity is 8.0 L (2 gallons) each. Cushion and separate the inside containers from batteries by a strong solid wooden partition.

A12.4.4.2. Package in boxes as follows:

Inner packaging	Outer packaging
Plastic bottles Note: Not over 1 L (1 quart) capacity each.	Boxes: wooden box (4C1, 4C2, 4D, 4F) Note: Pack no more than 24 bottles, securely separated from storage batteries and filling kits in each package.

A12.4.4.3. Package dry storage batteries or battery charger devices in fiberboard boxes (4G) with inner receptacles containing battery fluid. Complete package must conform to PG II requirements. Pack no more than 12 inner receptacles in one outer box. Maximum authorized gross weight is 34 kg (75 pounds).

A12.4.5. Batteries Packed without other materials (Domestic Shipments Only). The following nonspecification packagings are authorized for domestic only shipments of batteries packed without other materials:

A12.4.5.1. One to three batteries of not over 11.3 kg (25 pounds) each, packed in an outside box. Gross weight must not exceed 34 kg (75 pounds).

A12.4.5.2. A maximum of four batteries not over 7 kg (15 pounds) each may be packed in strong outside fiberboard or wooden boxes. They must be cushioned and packed to prevent short circuits. Gross weight must not be over 30 kg (65 pounds).

A12.4.5.3. A maximum of five batteries not over 4.5 kg (10 pounds) each may be packed in an outside fiberboard or wooden box. They must be securely cushioned and packed to prevent short circuits. Gross weight must not exceed 30 kg (65 pounds).

A12.4.5.4. Single batteries not over 34 kg (75 pounds) each, packed in five-sided slipcovers or in completely closed fiberboard boxes. Slipcovers and boxes must be of single or double-faced corrugated fiberboard of at least 91 kg (200 pounds) test strength. The slipcover or the fiberboard box must fit snugly and provide an inside top clearance of at least 1.3 cm (one-half inch) above battery terminals and filler caps with reinforcements in place. When assembled for shipment, the bottom edges of the slipcover may extend to the base of the battery and must not expose more than 25.4 mm (1 inch). The completed package (battery and box or slipcover) must be capable of withstanding a top-to-bottom compression test without damage to the battery terminals, cell covers, or filler caps.

A12.4.5.5. Single batteries exceeding 34 kg (75 pounds) each may be packed in completely closed fiberboard boxes. Boxes must be double-wall corrugated fiberboard of

at least 181 kg (400 pounds) test, or solid fiberboard testing at least 181 kg (400 pounds). A box may have holes in its ends provided that the handholes will not materially weaken the box. Sides and ends of the box must not be less than 1.3 cm (0.5 inch); and cushioning must be excelsior pads, corrugated fiberboard, or other suitable cushioning material. Protect the bottom of the battery by a minimum of one excelsior or double-wall corrugated fiberboard pad. Protect the top of the battery by a wood frame, corrugated trays or scored sheets of corrugated fiberboard having minimum test of 91 kg (200 pounds), or other equally effective cushioning material. Ensure the top protection bears evenly on connectors and/or edges of the battery cover to facilitate stacking of batteries. No more than one battery may be placed in one box. The maximum authorized gross weight is 91 kg (200 pounds).

A12.4.5.6. Large electric storage batteries protected against short circuit and firmly secured to skids or pallets capable of withstanding the shocks normally incident to transportation. The height of the completed unit must not be greater than 1.5 times the width of the skid or pallet. The unit must weigh not less than 136 kg (300 pounds) gross and must not fail under a superimposed weight equal to two times the weight of the unit. If the weight of the unit is greater than 907 kg (2,000 pounds), it must not fail with a superimposed weight of 1814 kg (4,000 pounds). Battery terminals must not be relied on to support any part of the superimposed weight. Each skid or pallet must be marked and labeled as required by **Attachment 14** and **Attachment 15**.

A12.5. Bombs, Smoke, Nonexplosive must be packaged as follows: Ship bombs, smoke, nonexplosive provided they are without ignition elements, bursting charges, detonating fuses, or other explosive components. Packaging must meet PG II performance standards. Package in an outer wooden box (4C1, 4C2, 4D, 4F) or plywood drum (1D).

A12.6. Chemical or First Aid Kits must be packaged as follows: This description is intended for boxes, cases, etc., containing small amounts of various hazardous materials used for medical, analytical, testing, or repair purposes. Mark containers in accordance with A14.4.7. and label in accordance with A15.4.6.

A12.6.1. Chemical kits shipped domestically as NA 1760 are excepted from specification packaging if the following requirements are met:

A12.6.1.1. The kit may contain only corrosive liquids.

A12.6.1.2. Inner receptacles within the kits must not exceed 250 ml (8.5 ounces) for liquids or 250g (0.55 pounds) for solids per receptacle.

A12.6.1.3. Cushion the inside containers with sufficient absorbent cushioning material to completely absorb the contents of the individual containers, and protect from damage by other materials in the kit.

A12.6.1.4. The contents of the kit must be of such a nature and packed so there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

A12.6.1.5. The outer container of the kit must be a strong wooden or metal container.

A12.6.2. Package chemical kits shipped domestically as NA 1760 and containing corrosive liquids in a fiberboard box (4G) with inner glass receptacles not over 10 L or 10 kg capacity each, securely cushioned and separated from other inside containers. The contents of the kit

must be of such a nature and so packed that there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

A12.7. Gallium must be packaged as follows: Package gallium metal in semi-rigid plastic inside packaging of not more than a 2.5 kg (5.5 pounds) net capacity each, then individually enclosed in a sealed bag of strong, leak-tight, and puncture-resistant material impervious to liquid gallium. Place the sealed bag in a wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), plastic box (4H1 or 4H2), fiber drum (1G), or steel drum (1A2) lined with a strong, leak-tight, and puncture-resistant material impervious to liquid gallium. If necessary to keep in a solid state, enclose this packaging in a strong, water-resistant outer packaging that contains dry ice or other means of refrigeration. The refrigeration must be sufficient to maintain the gallium in a completely solid state during the entire anticipated time it will be in transportation to its destination. If a refrigerant is used, all packaging materials must be chemically and physically resistant to the refrigerant and must have impact resistance at the low temperatures of the refrigerant used. If dry ice is used, the outer package must permit the release of carbon dioxide gas. Packaging must meet PG I performance standards. Manufactured articles, each not containing more than 100 mg (0.0035 ounce) of gallium and packaged so that the quantity per package does not exceed 1 g (0.35 ounce) are not subject to any other requirements of this manual (see **paragraph A3.1.16.3**).

A12.8. Hydrogen Fluoride must be packaged as follows: Package hydrogen fluoride (hydrofluoric acid, anhydrous) in cylinders, DOT 3, 3A, 3AA, 3B, 3BN, 3C, 3E, 4, 4A, 25, or 38; also DOT 4B, 4BA, 4BW, or 4C, if not brazed. Filling density must not exceed 85 percent of the water weight capacity of the cylinder. In place of the periodic volumetric expansion test required, cylinders used exclusively in this manner may be given a complete external visual inspection in conformance with 49 CFR Part 180, Subpart C at the time such periodic inspection becomes due and documented.

A12.9. Mercury (Metallic and Articles Containing Mercury) must be packaged as follows:

A12.9.1. Handling Instructions. Mercury is poisonous in liquid and vapor form and can be absorbed through the skin at room temperature. It is corrosive to aluminum and its alloys. It expands on freezing, and may crack glass containers.

A12.9.2. Packaging Requirements. Packaging must meet the PG I performance level. Pack inner containers with sufficient cushioning material to prevent breakage. Either the inner packaging or the outer packaging must have an inner liner or bags of strong leak-proof and puncture-resistant material, impervious to mercury, completely surrounding the contents and sealed which will prevent the escape of mercury from the package irrespective of its position. Manufactured articles, each containing not more than 100 mg (0.0035 ounce) of mercury and packaged so that the quantity of mercury per package does not exceed 1 g (0.0035 ounce) are not subject to any other requirements of this manual (see **paragraph A3.1.16.4**). Package mercury as follows:

A12.9.2.1. In inner earthenware, glass, or suitable plastic receptacles containing not more than 3.5 kg (7.7 pounds), glass ampoules containing not more than 0.5 kg (1.1 pounds), or iron or steel quicksilver flasks containing not more than 35 kg (77 pounds) of mercury. Package in outer wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), plastic box (4H2), steel drum (1A2), plywood drum (1D), fiber drum (1G), or steel jerrican (3A2).

A12.9.2.2. Use welded steel bottles with inner vaulted bottoms as single packagings. The closure must be a bolt with a conical thread and the opening must not exceed 20 mm (0.79 inches). The maximum authorized net quantity is 35 kg (77 pounds).

A12.9.2.3. Specification packagings are not required for manufactured articles or apparatuses containing mercury when packaged as follows:

A12.9.2.3.1. Manufactured articles or apparatus of which metallic mercury is a component part (manometers, pumps, thermometers, switches, etc.), except as otherwise covered in A12.9. These items must be packaged in a strong outer packaging. The inner liner and cushioning requirements of A12.9.2. apply.

A12.9.2.3.2. Mercury switches and relays are excepted from this manual if they are of the totally enclosed leak-proof type in sealed metal or plastic units. Thermometers, switches, and relays each containing a total quantity of not more than 15 g (0.53 ounces) of mercury, are also excepted if installed as an integral part of a machine or apparatus and so fitted that damage or leakage of mercury is unlikely to occur under conditions normally incident to transport.

A12.9.2.4. Package electrons tubes, mercury vapor tubes, and similar tubes as follows:

A12.9.2.4.1. In strong outer packagings with all seams and joints sealed with self adhesive, pressure-sensitive tape that will prevent the escape of mercury from the package. The maximum net quantity is 450 g (15.9 ounces) of mercury per package.

A12.9.2.4.2. Package tubes with more than 450 g (15.9 ounces) of mercury in strong outer packagings having sealed inner liners or bags of strong leak-proof and puncture-resistant material impervious to mercury, completely surrounding the contents which will prevent the escape of mercury from the package irrespective of its position.

A12.9.2.4.3. Tubes which do not contain more than 5 g (0.2 ounces) of mercury each and that are packed in the manufacturer's original packaging. Maximum total net quantity is 30 g (1.1 ounces) of mercury per package.

A12.9.2.4.4. Tubes which are completely jacketed in sealed leak-proof metal cases and are packed in the manufacturer's original packaging.

A12.9.2.5. Mercurial barometers complying with A12.9.2.3.1., that are loaded and unloaded from an aircraft under the supervision of, and are accompanied in flight by a US weather official or a similar US agency official (for example, Air Weather Service personnel), are excepted from any other requirements of this manual.

A12.10. Nitrating Acid Mixtures; Nitrating Acid Mixtures, Spent; or Nitric Acid must be packaged as follows: Do not package nitric acid exceeding 40 percent concentration with any other material. Package nitric acid as follows:

A12.10.1. Pack nitric acid in any concentration, which does not contain sulfuric acid or hydrochloric acid as impurities, in:

A12.10.1.1. Stainless steel drum (1A1). Do not ship containers weighing less than 85 percent of their original marked weight. Stainless steel used in drums must be at least 0.9 mm (.035 inches) for 55 L (15 gallon) nominal capacity, 1.2 mm (.047 inches) for 115 L (30 gallon) nominal capacity, and 1.5 mm (.059 inches) for 210 L (55 gallon) nominal

capacity. Type 304 or other grades of equivalent corrosion-resistant steel in as-welded condition are authorized for nitric acid concentrations of up to and including 78 percent. In addition to the UN specification markings, the marking as specified in 49 CFR §173.158(b)(1) must be included on the drum. An example of this marking is: 304HT/1.9/2.7/TW55. For all other concentrations of nitric acid the following are authorized:

A12.10.1.1.1. Type 304 heat-treated (quenched in water at 1040 degrees C [1900 degrees F]).

A12.10.1.1.2. Stabilized type 347 in the as-welded condition.

A12.10.1.1.3. Stabilized type 347 stress-relieved (845-900 degrees C [1550-1650 degrees F]).

A12.10.1.1.4. Stabilized type 347 heat-treated (quenched in water at 1040 degrees C [1900 degrees F]).

A12.10.1.1.5. Other grades of equivalent corrosion resistance.

A12.10.1.2. Expanded plastic box (4H1), with inner glass receptacles not over 2.5 L (0.66 gallons) capacity each. Pack no more than four glass inner receptacles in one outer packaging.

A12.10.2. Pack nitric acid of 90 percent or greater concentration in a wooden box (4C1, 4C2, 4D, or 4F), with inner glass bottles not over 2.5 L (0.66 gallons) capacity each. The inside containers must be individually overpacked and cushioned in tightly closed metal containers, then packed in the outer container.

A12.10.3. Pack nitric acid, of 80 percent or greater concentration that does not contain sulfuric acid or hydrochloric acid as impurities, in an aluminum drum (1B1). Maximum quantity is 38 L (10 gallons).

A12.10.4. Package nitric acid of less than 90 percent concentration in a wooden box (4C1, 4C2, 4D, or 4F) or fiberboard box (4G) with inside glass bottles not over 2.5 L (0.66 gallons) capacity each.

A12.10.5. Package nitric acid of more than 70 percent concentration in outer wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), steel drum (1A2), aluminum drum (1B2), plastic drum (1H2), plywood drum (1D), fiber drum (1G), or plastic jerrican (3H2) with inside containers:

A12.10.5.1. Glass or earthenware containers not over 1 L (1 quart) capacity each.

A12.10.5.2. Glass ampoules not over 0.5 L (1 pint) capacity each.

A12.10.6. Pack nitric acid of 70 percent or less concentration in outer wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), steel drum (1A2), aluminum drum (1B2), plastic drum (1H2), plywood drum (1D), fiber drum (1G), or plastic jerrican (3H2) with inside containers:

A12.10.6.1. Glass or earthenware not over 2.5 L (0.66 gallon) capacity each.

A12.10.6.2. Plastic not over 2.5 L (0.66 gallon) capacity each further individually placed into tightly closed metal packaging.

A12.10.6.3. Glass ampoules not over 0.5 L(0.1 gallon) capacity each.

A12.10.7. Pack nitric acid of 70 percent or less concentration in composite packaging (6PA1, 6PA2, 6PB1, 6PB2, 6PC, 6PD1, 6PH1, 6PH2). Composite packaging 6HH1 and 6HA1 meeting the compatibility requirements of 49 CFR §173.24(e) are also authorized.

A12.10.8. Pack nitric acid of 70 percent or less concentration in outer plastic box (4H1) with inside glass packaging containing not more than 2.5 L (0.66 gallon) each.

A12.11. Class 8 Materials With an Inhalation Hazard (Hazard Zone A and B) must be packaged as follows:

A12.11.1. Handling Instructions. These items are extremely dangerous. Approved chemical safety mask and clothing must be available when handling this material. (Handling instruction only required for Hazard Zone A material).

A12.11.2. Packaging Requirements. Package Class 8 materials with an Inhalation Hazard (Hazard Zone A and B) as follows:

A12.11.2.1. In DOT cylinders as identified in 49 CFR Part 178, Subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of A3.3.2.

A12.11.2.2. Packed in an inner drum (1A1, 1B1, 1N1, 1H1, or 6HA1), then placed in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum must not exceed 220 L (58 gallons). Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet the following requirements:

A12.11.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR §178.605) of 550 kPa (80 psig).

A12.11.2.2.2. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR §178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A12.11.2.2.3. Have screw-type closures that meet all the following requirements:

A12.11.2.2.3.1. Closed tightly to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A12.11.2.2.3.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A12.11.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psig).

A12.11.2.2.4. Meet the following minimum thickness requirements:

A12.11.2.2.4.1. 1A1 and 1N1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.3 mm (0.051 inches). 1B1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches).

A12.11.2.2.4.2. 1A1 and 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.7 mm (0.067 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches).

A12.11.2.3. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal securely cushioned with a nonreactive absorbent material. The package must be packed within a leak-tight packaging of metal or plastic, then packed in a steel drum (1A2), aluminum drum (1B2), metal drum other than steel or aluminum (1N2), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2). The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure must have a screw-type closure, which is held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A12.11.2.4. Pack in a metal drum (1A1, 1B1, or 1N1), or plastic drum (1H1), then placed in a metal drum (1A2 or 1H2), or a plastic receptacle with outer steel drum (6HA1). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, 1N1, or 1H1) must not exceed 220 L (58 gallons). This packaging is only authorized for Class 8, Hazard Zone B material. Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet the following requirements:

A12.11.2.4.1. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR §178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A12.11.2.4.2. Have screw-type closures that meet all the following requirements:

A12.11.2.4.2.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A12.11.2.4.2.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A12.11.2.4.2.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psig).

A12.11.2.4.3. Meet the following minimum thickness requirements:

A12.11.2.4.3.1. 1A1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 0.69 mm (0.027 inches). 1B1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 2.79 mm (0.110 inches). 1H1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.14 mm (0.045 inches). 6HA1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.70 mm (0.027 inches) for the outer steel drum.

A12.11.2.4.3.2. 1A1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.08 mm (0.043 inches). 1B1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches). 1H1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.124 inches). 6HA1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.96 mm (0.038 inches) for the outer steel drum.

A12.11.2.4.3.3. 1A1 or 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.35 mm (0.053 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches). 1H1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.124 inches). 6HA1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 1.08 mm (0.043 inches) for the outer steel drum.

A12.12. Fuel Cell Cartridges

A12.12.1. The weight of the fuel cells must not exceed 1 kg.

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Not required	Drums: Plywood (1D), Fibre (1G), Plastic (1H2) *or* Jerricans: Plastic (3H2) *or* Boxes: Wood (4C1, 4C2), Plywood (4D), Reconstituted Wood (4F), Fibreboard (4G), Plastic (4H2)

A12.13. Fuel Cells Contained in Equipment

A12.13.1. UN specification packaging is not required. Pack fuel cells in strong outer container . Installed fuel cells in equipment must be protected against short circuit and the entire system must be protected against inadvertent operation. Fuel cell systems must not charge batteries during transport.

A12.13.2. Protect the terminals of the installed fuel cells to prevent short circuit by use of protective coverings, taping, etc.

A12.14. Fuel Cells Packed With Equipment

A12.14.1. UN specification packaging is not required. Pack fuel cells in strong outer container. Fuel cells must be packed in inner packagings or placed in the outer packaging with cushioning material or divider(s) in order to protect against damage that may be caused by the movement or placement of contents within the outer packaging. The maximum number of fuel cell cartridges in the intermediate packaging may not be more than the number required to power the equipment plus two spares.

A12.15. Chlorosilanes must be packaged as follows: Packaging must meet the PG I or PG II performance standards.

A12.15.1. Package in the following combination drums, or boxes:

Inner packaging	Outer packaging
Receptacles: Glass, or steel	Drums: steel (1A2), plywood (1D), fiber (1G), or plastic (1H2) *or* Boxes: steel (4A), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)

A12.15.2. Package in the following composite drums:

Inner receptacle	Outer packaging
Plastic	Drums: steel drum (6HA1)

A12.15.3. Package in the following single drums, or jerricans:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Not required	Drums: steel (1A1) *or* Jerricans: steel (3A1)

A12.15.4. Package in Cylinders as prescribed for any compressed gas, except Specification 8, 3HT, and aluminum cylinders.

Attachment 13

CLASS 9--MISCELLANEOUS HAZARDOUS MATERIAL

A13.1. General Requirements. For military members, failure to obey the mandatory provisions from **paragraphs A13.2** through **A13.20** and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from **paragraph A13.2** through **A13.20** and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. This attachment contains a multitude of Class 9 commodities and personnel shall not deviate from unique packaging instructions provided. Not all packaging paragraphs are inclusive and packaging selection is based on the category of the hazard. This attachment contains information concerning the packaging and general handling instructions for Class 9 (Miscellaneous Hazardous Materials). See **Attachment 3** for other details concerning Class 9 material.

A13.2. Ammonium Nitrate Fertilizers; Benzaldehyde; Dibromodifluoromethane (Difluorodibromomethane); Environmentally Hazardous Substances, N.O.S.; Fish Meal, Stabilized; Fish Scrap, Stabilized; Hazardous Waste, N.O.S.; Other Regulated Substances; Polycholorinated Biphenyls (PCB); Zinc Dithionite, Zinc Hydrosulfite must be packaged as follows:

A13.2.1. Handling Instructions.

A13.2.1.1. Do not expose Dibromodifluoromethane to high temperature because, when it decomposes, toxic fumes are emitted. Store in a cool, ventilated area away from flame.

A13.2.1.2. Contains Otto Fuel II as a liquid propellant. In the event of a leak, avoid direct skin contact, ingestion, or inhalation of vapors. Vapors are toxic and may cause severe headache and nausea.

A13.2.2. Class 9 Liquids must be packaged as follows:

A13.2.2.1. Package in drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Drums: steel (1A2), aluminum (1B2), or metal drum, other than steel or aluminum (1N2), plywood (1D), fiber (1G), or plastic (1H2) *or* Barrel: wooden (2C2) *or* Jerricans: steel (3A2) or plastic (3H2) *or* Boxes: steel (4A1 or 4A2), aluminum (4B1 or 4B2), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)

A13.2.2.2. Package in drums, jerricans, or barrels as follows:

Inner packaging	Outer packaging
Not required	Drums: steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2), or plastic drum (1H1 or 1H2) *or* Barrel: wooden (2C1) *or* Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A13.2.2.3. Package in following composite package:

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, fiber, or plastic (6HA1, 6HB1, 6HG1, or 6HH) *or* Boxes: steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A13.2.2.4. Package in following composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1) *or* Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2) *or* expanded plastic packaging (6PH1 or 6PH2)

A13.2.2.5. Package in the following composite package:

Inner receptacle	Outer packaging
Plastic	Drum: plywood (6HD1)

A13.2.2.6. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A13.2.2.7. Fired exercise torpedoes or rockets, with no explosive components, containing Otto fuel II. Package in original or similar container authorized in **Attachment 5**.

A13.2.3. Class 9 Solids must be packaged as follows:

A13.2.3.1. Package in drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	Drums: steel (1A2), aluminum (1B2), or metal, other than steel or aluminum (1N2), plywood (1D), fiber (1G), or plastic (1H2) *or* Barrel: wooden (2C2) *or* Jerricans: steel (3A2) or plastic (3H2) *or* Boxes: steel (4A1 or 4A2), aluminum (4B1 or 4B2), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), or solid plastic (4H2)

A13.2.3.2. Package in drums, barrels, jerricans, boxes, or bags as follows:

Inner packaging	Outer packaging
Not required	Drums: steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal (other than steel or aluminum) (1N1 or 1N2), plywood (1D), plastic (1H1 or 1H2), or fiber (1G) *or* Barrel: wooden (2C1 or 2C2) *or* Jerricans: steel (3A1 or 3A2) or plastic (3H1 or 3H2) *or* Boxes: steel (4A1), steel with liner (4A2), aluminum with liner (4B2), natural wood (4C1), natural wood, sift-proof (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) *or* Bags: bag, woven plastic (5H1, 5H2, or 5H3), plastic film (5H4), textile (5L1, 5L2, or 5L3), or paper, multiwall, water-resistant (5M2)

A13.2.3.3. Package in the following composite packages:

Inner receptacle	Outer packaging

Inner receptacle	Outer packaging
Plastic	Drums: steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) *or* Boxes: steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A13.2.3.4. Package in the following composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	Drums: steel, aluminum, plywood, or fiber (6PA1, 6PB1, 6PD1, or 6PG1) *or* Boxes: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2) *or* expanded or solid plastic packaging (6PH1 or 6PH2)

A13.2.4. PCB Transformers. Palletize and tightly seal large transformers (over 400kg [886 pounds]) with PCB to prevent leakage. Place a large sheet of polyethylene under the transformer and extend it at least one quarter of the way up its sides. Provide enough vermiculite to absorb any leakage. These type transformers are exempt from UN specification packaging requirements.

A13.3. Consumer Commodities must be packaged as follows:

A13.3.1. The following applies:

A13.3.1.1. Items must meet the definition of a consumer commodity (see **Attachment 1**).

A13.3.1.2. Items must be permitted as a limited quantity according to A19.3.2.

A13.3.1.3. Use a strong outer package. UN specification packaging is not required.

A13.3.1.4. Each final completed package must not exceed 25 kg (55 pounds) for international shipment or must not exceed 30 kg (66 pounds) for domestic shipment.

A13.3.1.5. Completed packages containing breakable or brittle inner packages must be capable of withstanding a 4 foot drop on solid concrete.

A13.3.1.6. Packaging must meet general requirements of **Attachment 3**.

A13.3.2. Class 2 (Non-Toxic Aerosols). Must meet the following provisions:

A13.3.2.1. Limit Class 2 substances to inner non-refillable non-metal receptacles not exceeding 120 ml (4 fluid ounces) capacity each, or in inner non-refillable metal receptacles not exceeding 820 ml (28 fluid ounces) capacity each. Flammable aerosols must not exceed 500 ml (17 fluid ounces) capacity each. The following provisions apply to all aerosols under this paragraph:

A13.3.2.1.1. The pressure in the aerosol must not exceed 1,500 kPa at 55 degrees C (217 psi at 130 degrees F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55 degrees C (130 degrees F);

A13.3.2.1.2. If the pressure in the aerosol exceeds 970 kPa at 55 degrees C (160 psi at 130 degrees F) but does not exceed 1105 kPa at 55 degrees C (160 psi at 130 degrees F), use an inner metal IP7, IP7A, or IP7B receptacle.

A13.3.2.1.3. If the pressure in the aerosol exceeds 1,105 kPa at 55 degrees C (160 psi at 130 degrees F) but does not exceed 1245 kPa at 55 degrees C (180 psi at 130 degrees F), use an inner metal IP7A or IP7B receptacle.

A13.3.2.1.4. If the pressure in the aerosol exceeds 1,245 kPa at 55 degrees C (180 psi at 130 degrees F), use an inner metal IP7B receptacle. IP7B metal receptacles having a minimum burst pressure of 1,800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated above do not apply to the pressure within the capsule. The quantity of gas contained in the capsule must be so limited that the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into an aerosol.

A13.3.2.1.5. The liquid content must not completely fill the closed receptacle at 55 degrees C (130 degrees F).

A13.3.2.1.6. Each aerosol exceeding 120 ml (4 fluid ounces) capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion or other defect.

A13.3.2.1.7. Protect the valves by a cap or other suitable means during transport.

A13.3.2.2. For aerosols containing a biological or medical preparation that will be deteriorated by a heat test and which are non-toxic and non-flammable, packed in inner non-refillable receptacles not exceeding 575 ml (19.4 fluid ounces) capacity each, the following provisions apply:

A13.3.2.2.1. The pressure in the aerosol must not exceed 970 kPa at 55 degrees C (140.7 psi at 130 degrees F).

A13.3.2.2.2. The liquid contents must not completely fill the closed receptacle at 55 degrees C (130 degrees F).

A13.3.2.2.3. One aerosol out of each lot of 500 or less, must be heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion or other defect.

A13.3.2.2.4. Protect the valves by a cap or other suitable means during transport.

A13.3.3. Class 3. The following applies to Class 3 material:

A13.3.3.1. For domestic shipment, the contents of each inner package will not exceed the following: Packing Group I, 0.5 L (0.1 gallon); Packing Group II, 1.0 L (0.3 gallon); and Packing Group III, 5.0 L (1.3 gallons).

A13.3.3.2. For international shipment, each inner package must not exceed 500 ml (17 fluid ounces).

A13.3.4. Class 4.1.

A13.3.4.1. For substances in Packing Group II, each inner package must not exceed 1.0 kg (2.2 pounds) net capacity each.

A13.3.4.2. For substances in Packing Group III, each inner package must not exceed 5.0 kg (11 pounds) net capacity each.

A13.3.5. Class 5.1.

A13.3.5.1. For substances in Packing Group II, each inner package must not exceed 1.0 L (0.3 gallon) net capacity for liquids or 1.0 kg (2.2 pounds) net capacity for solids.

A13.3.5.2. For substances in Packing Group III, each inner package must not exceed 5 L (1.3 gallons) net capacity for liquids or 5.0 kg (11 pounds) net capacity for solids.

A13.3.6. Class 5.2. (Non-Temperature Controlled).

A13.3.6.1. For Type D, E, or F, each inner package must not exceed 125 ml (4.22 fluid ounces) net capacity for liquids or 500 g (17.64 ounces) net capacity for solids.

A13.3.6.2. For Type B or C, each inner package must not exceed 25 ml (0.845 fluid ounce) net capacity for liquids or 100 g (3.528 ounces) net capacity for solids.

A13.3.7. Class 6.1.

A13.3.7.1. For domestic shipment, the contents of each inner package will not exceed the following: Liquids in Packing Group III, each inner package must not exceed 5.0 L (1.3 gallons) net capacity each, and for solids, each inner package must not exceed 5.0 kg (11 pounds) net capacity each..

A13.3.7.2. For international shipment, each inner package must not exceed 500 ml (17 fluid ounces) net capacity for liquids and 500 g (18 ounces) net capacity for solids.

A13.3.8. Class 8.

A13.3.8.1. For substances in Packing Group II, each inner package must not exceed 1.0 L (0.3 gallon) net capacity each for liquids or 1.0 kg (2.2 pounds) net capacity for solids.

A13.3.8.2. For substances in Packing Group III, each inner package must not exceed 5.0 L (1.3 gallon) net capacity each for liquids, or 5.0 kg (11 pounds) net capacity for solids.

A13.3.9. Class 9.

A13.3.9.1. For liquids, each inner package must not exceed 5.0 L (1.3 gallon) net capacity.

A13.3.9.2. For solids, each inner package must not exceed 5.0 kg (11 pounds) net capacity.

A13.4. Vehicles must be packaged as follows: The following general requirements apply:

A13.4.1. Compliance With Technical Orders. Use service technical manuals to prepare items for shipment.

A13.4.2. Fuel Limitations. Comply with **paragraph A3.3.3.4** when determining actual fuel level requirements to meet operational needs. Each liquid vehicle fuel tank, including units rigged for airdrop or units being transported as cargo to a staging area for a subsequent airdrop, may be no more than one-half full with the following exceptions:

A13.4.2.1. When the technical manual requires draining and purging.

A13.4.2.2. When unit is susceptible to fuel spills or leakage (see **paragraph A3.3.3.6**), unit must be drained and capped.

A13.4.2.3. When loaded on the aircraft cargo ramp, the vehicle fuel tank must be drained if the fuel tank openings cannot be located on the high side of the ramp.

A13.4.2.4. When palletized or loaded on a trailer, drain fuel tanks. Units palletized due to the aircraft's subfloor requirements may contain fuel in tank.

A13.4.2.5. When transported under the authority of **Chapter 3** of this manual, the following fuel limitations apply:

A13.4.2.5.1. Each liquid vehicle fuel tank will not exceed three-fourths full.

A13.4.2.5.2. Units on the aircraft cargo ramp or when loaded on the aircraft with a steep angle of ascent (e.g., KC-10, KC-135) will not exceed one-half full per tank.

A13.4.2.5.3. Series M998 High Mobility Multi-Wheeled Vehicles (HMMWV) may face aft on the cargo ramp with the fuel tank opening on the low side of the ramp. Fuel (JP-8 or diesel only) will not exceed one-half tank. Vehicles will be equipped with a fuel injection delivery system, and an open vent line to allow pressure equalization during decompression.

A13.4.2.6. Boats and other watercraft loaded on trailers or palletized will be drained to the greatest extent possible. When transported or airdropped under the authority of **Chapter 3** of this manual, each integral fuel tank may be three-fourths full. During exercises/training (insertion, rescue, etc.), fuel levels will be the minimum amount necessary to meet mission objective, not to exceed three-fourths full. Only approved portable non-bulk fuel tanks may contain fuel.

A13.4.2.7. Transport fueled helicopters and aircraft with fuel in each tank not to exceed 150 gallons or three-fourths full, whichever amount is least. Do not exceed one-half tank full for units loaded on the aircraft cargo ramp. Fuel leakage must not occur during shipment. No special venting is required other than to maintain normal aircraft ventilation during flight. Seal vents according to service technical directives. Load tanks to prevent fuel leakage when the loading configuration requires removal of external fuel tanks. When removed in this manner, the tanks are still considered a component of the aircraft or helicopter.

A13.4.2.8. When aircraft wings are removed from aircraft body, completely drain fuel tanks within wings. Purging is not required. When transported with the original aircraft body, consider all pieces as a single unit for identification on the Shipper's Declaration form.

A13.4.2.9. Unmanned aerial vehicles (UAV) prepared according to technical publications/manuals may be shipped drained but not purged. Remaining fuel levels will be as specified in the appropriate technical publication/manual.

A13.4.2.10. When loaded in a freight container, each vehicle fuel tank must be drained. The fuel tank and system must be purged if required by the item's technical directive, or if the flash point of the fuel is less than 38 degrees C (100 degrees F). In the absence of specific draining and purging procedures:

A13.4.2.10.1. Completely drain all fuel

A13.4.2.10.2. Run engine until it stalls

A13.4.2.10.3. Allow fuel tanks and lines to remain open for 24 hours.

A13.4.2.10.4. Installed batteries must be non-spillable or non-regulated. If battery is non-regulated and no other hazards are present (e.g., fire extinguisher), a Shipper's Declaration is not required. Comply with A3.1.16.

A13.4.2.11. Fuel servicing vehicles will have refueling system bulk tank and lines purged (for liquids with a flash point less than 38 degrees C (100 degrees F)) or drained to the maximum extent possible (for liquids with a flash point at or above 38 degrees C (100 degrees F)) according to technical directives (technical orders, field manuals, etc.) so that no more than 5 gallons of fuel remains in the tank/lines.

A13.4.2.12. Liquefied petroleum gas or compressed gas powered vehicles must have the gaseous fuel completely emptied from any non-DOT specification pressurized vessel (fuel tank), lines, and regulator. Ensure tanks are securely closed. Purging is not required.

A13.4.2.13. Liquefied petroleum gas or compressed gas powered vehicles containing a DOT specification cylinder as the gaseous fuel tank do not require draining. Comply with all requirements of **Attachment 6** for the material and cylinder specification. Tightly close and secure cylinder shut off valve. Lines and regulator must be completely emptied of flammable gas and vapors.

A13.4.2.14. Fuel cell powered vehicles. The fuel cell must be secured and protected in a manner to prevent damage to the fuel cell. Equipment (other than vehicles, engines or mechanical equipment) such as consumer electronic devices containing fuel cells (fuel cell cartridges) must be described as ''Fuel cell cartridges contained in equipment.''

A13.4.3. Secondary Hazards. Installed components, equipment, and vehicle secondary hazards (e.g., fire extinguishers, jerricans, etc.) must be in properly configured and approved holders designed for use with the vehicle. The following applies:

A13.4.3.1. Do not remove other hazardous materials from their packaging and store in the racks or containers of vehicles or equipment unless authorized by **paragraph A5.2**.

A13.4.3.2. Batteries will be secured upright in designed holders except non-spillable batteries meeting **Table A4.2**, Special Provision A67 as nonhazardous, must be oriented in a manner to fit designed holder. Protect the terminals of installed batteries to prevent short circuit by use of battery boxes, protective covers, taping, etc. If battery cables are disconnected, they must be secured away from terminals, and the terminals protected.

A13.4.3.3. When loaded in a freight container, remove acid or alkali batteries and package according to A12.4. Do not ship packaged wet-cell batteries inside a freight container unless accessible during flight. Non-spillable and non-hazardous gel-type batteries may remain in the vehicle holder provided they remain upright and the cables are disconnected. Tape the ends of the cables/terminals to prevent short circuit.

A13.4.3.4. Engines, generators, and other equipment that are by design an approved part of an M-Series vehicle must be drained to the greatest extent possible (not to exceed 17 ounces) except the tanks may be one-half full when the vehicle is transported under the authority of **Chapter 3** of this manual. Engines and generators mounted to a vehicle, SE or trailer for convenience of movement or handling must always be drained to the greatest possible extent. Purging is not necessary unless required by the item's technical instructions. Use UN Specification packaging (e.g., jerricans) for transport of spare fuel whenever possible.

A13.4.3.5. Prepare aircraft and helicopters for transportation according to the requirements of the respective aircraft's shipping manual.

A13.4.3.5.1. Remove all munitions and explosives, other than those installed as permanent-type aircraft equipment, according to the pertinent aircraft technical order and A3.3.1.9.

A13.4.3.5.2. Emergency equipment (e.g., life vests, signal kits, etc.) required for safe operation of the aircraft, helicopter, or boat when transported according to DTR, Part III, do not require removal if secured in approved holders/racks.

A13.4.3.5.3. Fasten batteries securely in the holder provided, with the terminals protected in such a manner as to prevent damage or short circuits. When batteries are removed and shipped with the aircraft, accomplish packaging and certification according to A12.4.

A13.4.3.6. Air-bag modules installed as a vehicle component are not subject to any other requirements of this manual.

A13.5. Internal Combustion Engines and SE must be packaged as follows: The following general requirements apply:

A13.5.1. Compliance With Technical Orders. Use service technical manuals to prepare items for shipment.

A13.5.2. Fuel Limitations. Completely drain engine-powered SE of fuel. Up to 500 ml (17 ounces) of fuel may be left in engine components and fuel lines provided all lines and fuel tanks are securely closed to prevent leakage of fuel. Drain and purge when required by the applicable technical manual. The following exceptions/additional restrictions apply:

A13.5.2.1. Engine-powered SE with large fuel systems that the shipper determines cannot be drained to 500 ml (17 ounces) must be drained within the mechanical limits of the equipment to the extent no free standing liquid remains in the fuel tank, lines, or system.

A13.5.2.2. When transported under the authority of **Chapter 3** of this manual, wheeled-engine powered SE may contain up to one-half tank of fuel. Ship only the minimum quantity of fuel consistent with operational requirements. Ship the Hobart-86 all models

with no more than one-quarter tank of fuel and load with filler neck facing forward. Ensure tanks are securely closed. Non-wheeled engine powered SE must be drained with no more than 500 ml (17 ounces) of residual fuel remaining.

A13.5.2.3. Completely drain single axle equipment loaded with the tongue resting on the aircraft floor. The requirements of A13.5.2. or A13.5.2.1. apply depending on the type and size of equipment.

A13.5.2.4. Engines that are damaged or inoperable and purging cannot be accomplished, or proper purging facilities are unavailable must be drained to the maximum extent possible and install plugs, caps, and covers over all openings as required by technical directives.

A13.5.2.5. Engines which are drained and purged according to the responsible technical manual, and containing no other hazardous material, are nonhazardous for transportation. Comply with **paragraph A3.1.16.4**.

A13.5.2.6. Ship the Aerial Bulk Fuel Delivery System (ABFDS) consisting of 3000 gallon bladders under the following conditions:

A13.5.2.6.1. Completely drain the bulk fuel bladders. Due to bladder construction there will be residual fuel remaining. Ensure bladders are drained as much as possible.

A13.5.2.6.2. Completely drain the pump module. No more than 500 ml (17 ounces) of fuel may be left in engine components.

A13.5.2.6.3. Securely close all vents and valves to prevent residual fuel leaks.

A13.5.2.6.4. When prepared in this manner, ABFDS may be stacked for shipment.

A13.5.2.7. Liquefied petroleum gas or compressed gas powered engines or equipment must have the gaseous fuel completely emptied from any non-DOT specification pressurized vessel (fuel tank), lines, and regulator. Ensure tanks are securely closed. Purging is not required.

A13.5.2.8. When loaded in a freight container, fuel tanks must be drained. The fuel tank and system must be purged if required by the item's technical directive, or if the flash point of the fuel is less than 38 degrees C (100 degrees F). In the absence of specific draining and purging procedures:

A13.5.2.8.1. Completely drain all fuel.

A13.5.2.8.2. Run engine until it stalls.

A13.5.2.8.3. Allow fuel tanks and lines to remain open for 24 hours.

A13.5.2.8.4. Installed batteries must be non-spillable or non-regulated.

A13.5.2.9. When unit is susceptible to fuel spills or leakage (see **paragraph A3.3.3.6**), unit must be drained and capped.

A13.5.2.10. Fuel cell powered engines or equipment. The fuel cell must be secured and protected in a manner to prevent damage to the fuel cell. Equipment (other than vehicles, engines or mechanical equipment) such as consumer electronic devices containing fuel

cells (fuel cell cartridges) must be described as ‘‘Fuel cell cartridges contained in equipment.’’

A13.5.3. Secondary Hazards. Installed components, equipment, and secondary hazards (e.g., fire extinguishers, jerricans, etc.) must be in properly configured and approved holders designed for use with the unit. The following applies:

A13.5.3.1. Batteries will be secured upright in designed holders except non-spillable batteries meeting **Table A4.2**, Special Provision A67 as nonhazardous, must be oriented in a manner to fit designed holder. Protect the terminals of installed batteries to prevent short circuit by use of battery boxes, protective covers, taping, etc. If battery cables are disconnected, they must be secured away from terminals, and the terminals protected.

A13.5.3.2. When loaded in a freight container, remove acid or alkali batteries and package according to A12.4. Do not ship packaged wet-cell batteries inside a freight container unless accessible during flight. Non-spillable and non-hazardous gel-type batteries may remain in the equipment holder provided they remain upright and the cables are disconnected. Tape the ends of the cables/terminals to prevent short circuit.

A13.6. Battery Powered Equipment and Vehicles must be packaged as follows: Prepare items powered by wet cell or non-spillable batteries (includes items with batteries as an installed integral component e.g. tactical shelters, trailers, etc.) as follows:

A13.6.1. Use service technical manuals to prepare items for shipment.

A13.6.2. Batteries will be secured upright in designed holders except non-spillable batteries meeting **Table A4.2**, Special Provision A67 as nonhazardous, may be oriented in a manner to fit designed holder. Protect the terminals of installed batteries to prevent short circuit by use of battery boxes, protective covers, taping, etc. If battery cables are disconnected, they must be secured away from terminals, and the terminals protected. Remove the battery and ship according to A12.4. if the item is likely to be shipped in other than an upright position.

A13.6.3. Securely fasten original installed equipment in properly configured and approved holders. Do not remove other hazardous materials from their packaging and store in the racks or containers of vehicles or equipment.

A13.6.4. Wheelchairs equipped with non-spillable batteries must have the batteries protected against short circuits and securely attached to the wheelchair or removed and boxed. Specification packaging is not required.

A13.6.5. Wheelchairs equipped with spillable batteries for carriage on aircraft in cargo compartments that can accommodate upright loading and storage of the wheelchairs must be secured in an upright position in the cargo compartment. Batteries must remain installed and be securely attached to the chair. Protect the terminals against short circuits. Wheelchairs must be deactivated by removing connections at battery terminals or by otherwise disconnecting their power source. Remove the battery and ship according to **A12.4** if the item is likely to be shipped in other than an upright position.

A13.7. Lithium Cells and Batteries.

A13.7.1. Lithium cells and batteries must meet the requirements of **paragraph A3.3.9.2**. except **paragraphs A3.3.9.2.3** and **A3.3.9.2.4**.

A13.7.2. Package cells and batteries as follows:

A13.7.2.1. Package cells and batteries in combination packagings with inner packagings that completely enclose the cell or battery. Pack inner packaging inside an outer metal box (4A or 4B), wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), or solid plastic box (4H2), fiber drum (1G), metal drum (1A2 or 1B2), plywood drum (1D), plastic jerrican (3H2), or metal jerrican (3A2 or 3B2). Packaging must meet PG II performance level. UN Specification packaging is not required when individual spare batteries are hand-carried according to **Chapter 3** of this manual.

A13.7.2.2. Batteries exceeding 12 kg. Batteries employing a strong, impact-resistant outer casing and exceeding a gross weight of 12 kg (26.5 lbs.), and assemblies of such batteries, may be packed in strong outer packagings, in protective enclosures (for example, in fully enclosed wooden slatted crates) or on pallets. Batteries must be secured to prevent inadvertent movement, and the terminals must not support the weight of other superimposed elements. Batteries packaged in this manner are not permitted for transportation by passenger aircraft, and may be transported by cargo aircraft only if approved by the Associate Administrator prior to transportation.

A13.7.2.3. Used Batteries.

A13.7.2.3.1. Air movement of used liquid cathode lithium batteries from forward combat or exercise area is authorized if it is the only mode available. Individually wrap batteries in nonconductive material and place in a strong outer container with at least one-inch of inert material surrounding each battery.

A13.7.2.3.2. Rechargeable lithium ion or lithium polymer and solid cathode batteries may be shipped in a fully charged state when packaged according to A13.7.2.1. or A13.7.2.2. They may be shipped packaged per A13.7.2.3.1. from forward combat or exercise area without regard to voltage.

A13.8. Lithium Batteries Contained in Equipment.

A13.8.1. Lithium cells and batteries must meet the requirements of **paragraph A3.3.9.2**. except **paragraphs A3.3.9.2.3** and **A3.3.9.2.4**.

A13.8.2. UN specification packaging is not required. Pack equipment with installed lithium batteries in a strong waterproof outer packaging or in an outer packaging made waterproof through the use of a liner (unless the equipment is made waterproof by nature of its construction). Secure the equipment within the outer packaging to prevent movement, short circuit, or accidental operation during transport. If equipment is too large to be effectively packaged, the battery itself may be contained in the equipment in a packaging that meets the requirements of this paragraph.

A13.8.2.1. The package may contain no more than the number of lithium cells or batteries necessary to power the piece of equipment plus two spare cells or batteries. The additional cells or batteries must be packaged in accordance with **A13.7.2**.

A13.8.2.2. If package contains cells or batteries in equipment and other cells or batteries packed with equipment, the package must be marked with the proper shipping name ``Lithium metal batteries packed with equipment'' or ``Lithium ion batteries packed with equipment'' as appropriate.

A13.8.2.3. Lithium batteries contained in vehicles, engines, or mechanical equipment must be securely fastened in the battery holder of the vehicle, engine, or mechanical equipment and must be protected in such a manner as to prevent damage and short circuits (e.g., by the use of non-conductive caps that cover the terminals entirely).

A13.8.3. For airdrop missions authorized according to **Chapter 3** of this manual, pack electronic equipment hand carried in a rucksack, in a shipping (airdrop) container, or as a door bundle depending on mission requirements. Shipper's Declaration for Dangerous Goods certification is not required.

A13.9. Lithium Batteries Packed With Equipment.

A13.9.1. Lithium cells and batteries must meet the requirements of **paragraph A3.3.9.2**. except **paragraphs A3.3.9.2.3** and **A3.3.9.2.4**.

A13.9.2. The cells or batteries must be packed to prevent short circuits, including shifting that could lead to short circuits. The equipment and the packages of cells or batteries must be further packed in a strong outer packaging.

A13.9.3. The package may contain no more than the number of lithium cells or batteries necessary to power the piece of equipment plus two spare cells or batteries.

A13.9.4. For missions authorized according to **Chapter 3** of this manual, electronic equipment may be hand carried in a rucksack, packed in a shipping (airdrop) container, or in a door bundle depending on mission requirements. Shipper's Declaration for Dangerous Goods certification is not required.

A13.10. Carbon Dioxide, Solid (Dry Ice) must be packaged as follows:

A13.10.1. Handling Instructions. Dry ice is extremely cold and will damage human tissue on contact. Store only in well ventilated areas. Never store in hermetically or tightly sealed containers. To minimize carbon dioxide concentration within the aircraft during ground operations, open the cargo/ access doors and emergency escape hatches for maximum ventilation.

A13.10.2. Packaging Requirements.

A13.10.2.1. Wrap in kraft paper, secure with tape, and pack in fiberboard boxes, polystyrene foam containers or other suitable packaging designed and constructed to permit the release of carbon dioxide gas and to prevent a build-up of pressure that could rupture the packaging. UN specification packaging is not required.

A13.10.2.2. Prepare DOD medical shipments requiring use of dry ice according to DLAR 4145.21/TB MED 284/NAVSUPINST 4610.31A/AFJI 41-208, *Preparation of Medical Material Requiring Freeze or Chill Environment for Shipment.*

A13.10.2.3. Prepare non-hazardous shipments requiring dry ice according to technical directives or industry standards. Outer packaging must be fiberboard boxes, polystyrene foam containers, or other suitable packaging designed and constructed to permit the release of carbon dioxide gas and to prevent build-up of pressure that could rupture the packaging. UN specification packaging is not required.

A13.11. Magnetized Material must be packaged as follows:

A13.11.1. Handling Instructions. Do not store magnetic materials suitable for military airlift closer than 4.6 m (15 feet) to compass sensing devices or other devices unduly affected by magnetic fields.

A13.11.2. Packaging Requirements. Shield magnetic materials when required to reduce magnetic field strength to not greater than 5.25 milligauss or two degrees deviation of a magnetic compass at a distance of 4.6 m (15 feet). Ensure that meters used to measure the magnetic field are properly operational, and whenever possible, that the item be measured by two different devices. Provide blocking and bracing as required. Additional packaging details are included in TO 00-25-251. Package magnetic tubes individually in compliance with MIL-E-75. Package magnetically susceptible items to make sure that the distance between the magnetic surface and outside of the innermost container is no less than the protective distance required, and in no instance less than 102 mm (4 inches). UN specification packaging is not required. Magnetic material that has a magnetic field strength greater than 0.00525 gauss at 4.6m (15 feet) is forbidden for air movement.

A13.12. Life-Saving Appliances must be packaged as follows: Life-saving appliances, self-inflating or nonself-inflating, include (but are not limited to) life raft kits, life vest kits, survival kit assemblies, ejection seats, non-ejection seats, and parachutes that contain small quantities of hazardous material that are required as part of the survival equipment. Kit contents may include, but are not limited to, flammable items (fire starter and matches), ammunition items (cartridges and shells), pyrotechnics (signal flares), and nonflammable compressed gas cylinders (carbon dioxide and breathing oxygen).

A13.12.1. Handling Instructions. Store in cool, well-ventilated areas away from fire hazards and sources of heat or ignition. Do not drop or rough handle.

A13.12.2. Packaging Requirements:

A13.12.2.1. Pack kits in weather-resistant fiberboard or other securely closed strong outer container. Pack hazardous materials contained in the kit in inner packaging that is adequate to prevent accidental activation. Suitably cushion the inner packagings to prevent movement. Packagings must meet the general requirements of A3.1. UN specification packaging is not required.

A13.12.2.2. Individually assigned kit hand carried by a crewmember. This paragraph applies only to support operations involving recovery of inoperable aircraft or return of a flight crewmember as a passenger to maintain accountability of an individually assigned kit. For unit deployments see **paragraph 3.5** or transport as palletized cargo according to **A13.12.2.1**. This does not apply to contract passenger or commercial aircraft. The following applies:

A13.12.2.2.1. Package life-saving appliances in a strong outer container or A-3 bag. The requirements of **A13.12.2.1** for inner packing and cushioning apply.

A13.12.2.2.2. Individual assigned kits may be handcarried by crew members. Crew members must inform the Air Terminal Operations Center, when transporting life-saving appliances in this manner. Items will be stored as directed by the transporting aircraft commander.

A13.12.2.2.3. When prepared and handcarried according to this paragraph, no other requirements of this manual apply while in kit is in possession of the crewmember.

A13.13. Dangerous Goods in Apparatus or Machinery must be packaged as follows: Apply this description only to apparatus or machinery containing hazardous material as an integral component of the item. This description may also be used for items that are normally a part of an end item or required to serve an operational function, but are removed and shipped separately (i.e., fuel tanks or bladders). Do not use this description for machinery or apparatus for which a PSN already exists in **Table A4.1**. The following applies:

A13.13.1. For other that fuel system components, apparatus or machinery may only contain hazardous materials permitted as limited quantities under **A19.3**, or authorized magnetized material, or gasses of Division 2.2 without subsidiary risk, but excluding refrigerated liquefied gasses.

A13.13.2. If more than one hazardous material is present, the material must not be capable of reacting dangerously together.

A13.13.3. The total net quantity of hazardous materials contained in one package must not exceed the following:

A13.13.3.1. 1 kg (2.2 pounds) for solids

A13.13.3.2. 500 ml (17 ounces) for liquids

A13.13.3.3. 0.5 kg (1.1 pounds) for Class 2.2 gases

A13.13.4. Secure or cushion receptacles containing hazardous material to prevent breakage or leakage and to control movement within the item during transport. Cushioning material must not react dangerously with or have protective properties adversely affected by any leakage.

A13.13.5. Ensure that, in the event of damage to receptacles, no leakage of the hazardous material from the apparatus or machinery is possible. A leak-proof liner is required for articles that are completed drained of liquid but not purged. All openings and lines must be capped or sealed according to applicable technical directives.

A13.13.6. Class 2.2 gases must be in authorized cylinders according to **Attachment 6**.

A13.13.7. Pack in strong outer packagings unless the receptacles containing the hazardous material are adequately protected by the construction of the apparatus or machinery. UN specification packaging is not required.

A13.14. Class 9 Materials must be packaged as follows: UN specification packaging is not required for material packaged according to this paragraph. Use any appropriate non-bulk packaging that meets the requirements of **Attachment 3** to ship liquid or solid material. The following applies.

A13.14.1. Provide enough outage for packagings of 208 L (55 gallon) capacity or less, so that the packaging will not be liquid full at 54 degrees C (130 degrees F).

A13.14.2. Make sure that when a liquid or solid has an absolute vapor pressure over 110 kPa (16 psi) at 38 degrees C (100 degrees F) the primary packaging is capable of withstanding the inside vapor pressure at 54 degrees C (130 degrees F) without leakage.

A13.14.3. Package material that may cause a hazard in transportation due to its reaction with water in either an inner or outer waterproof packaging.

A13.15. Air Bag Inflators, Air Bag Modules, and Seat-Belt Pretensioners must be packaged as follows: Item classification as Class 9 must be approved by DOT according to 49 CFR §173.166. Package in boxes, drums, or jerricans as follows:

Inner packaging	Outer packaging
Not required.	Boxes: fiberboard (4G), wooden (4C1 or 4C2), reconstituted wood (4F), or solid plastic (4H2) *or* Drums: steel (1A2), aluminum (1B2), fiber (1G), or plastic (1H2) *or* Jerricans: steel (3A2) or plastic (3H2)

A13.16. Asbestos (Hydrated Mineral Silicates) must be packaged as follows: Asbestos blue, brown, or white, includes any of the following hydrated mineral silicates: chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, actinolite asbestos, and every product containing any of these materials. Asbestos that is immersed or fixed in a natural or artificial binder material (such as cement, plastic, asphalt, resins, or mineral ore) and manufactured products containing asbestos are not subject to this paragraph. Asbestos must be loaded, handled, unloaded, and any contamination of aircraft removed in such a manner that will minimize occupational exposure to airborne particles released incident to transportation. Packaging must meet the general packaging requirements of A3.1. UN specification packaging is not required. Package asbestos in:

A13.16.1. Rigid, leak tight packaging such as metal, plastic, or fiber drums.

A13.16.2. Bags or other nonrigid packaging that are dust and sift-proof. The packages must be palletized and unitized by methods such as shrink-wrapping in plastic or wrapping in fiberboard secured by strapping.

A13.16.3. Bags or other nonrigid packaging that are dust and sift-proof in strong outer fiberboard or wooden boxes.

A13.17. Polymeric Beads, Expandable and Plastic Molding Compound must be packaged as follows: Pack polymeric beads or granules, expandable, evolving flammable vapor and plastic molding compound in dough, sheet or extruded rope form, evolving flammable vapor in boxes or drums as follows:

Inner packaging	Outer packaging
Sealed plastic liner	Boxes: wood (4C1 or 4C2), plywood (4D), fiberboard (4G), or reconstituted wood (4F) *or* Drums: plywood (1D) or fiber (1G) Note: Vapor tight metal or plastic drums (1A1, 1A2, 1B1, 1B2, 1H1 or 1H2) may also be used (without liner).

A13.18. Chemical or First Aid Kits must be packaged as follows:

A13.18.1. This description is intended for boxes, cases, etc., containing small amounts of various hazardous materials used for medical, analytical, or testing purposes.

A13.18.1.1. The PG assigned to the kit as a whole must be the most stringent PG assigned to any individual substance in the kit.

A13.18.1.2. The contents of the kit must be of such a nature and so packed that there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

A13.18.1.3. The only hazardous materials authorized in the kits are substances authorized as limited quantities according to A19.3.2., and excepted quantities according to A19.2., provided the inner packaging requirements of A19.2.3. are met.

A13.18.2. Package as follows:

A13.18.2.1. Except for Division 5.2, in inner receptacles of no more than 250 mL (8.5 fluid ounces) for liquids or 250 g (9 ounces) for solids. For Division 5.2 (organic peroxide) Type D, E and F (only), inner receptacles of no more than 125 mL for liquids or 250 g for solids.

A13.18.2.2. The total quantity of hazardous material in any one kit must not exceed 1 L (1 quart) for liquids or 1 kg (2.2 pounds) for solids. The total quantity of dangerous goods in any one package must not exceed 10 kg (22 pounds).

A13.18.2.3. Protect inner receptacles from other materials in the kit and pack in wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), expanded plastic (4H1), solid plastic (4H2), fiberboard (4G), steel (4A), or aluminum (4B) box.

A13.18.3. Refer to **Table A19.2**, Note 1 for limited quantities of hazardous material in Chemical or First Aid Kits.

A13.19. Polystyrene Beads, Expandable, Evolving Flammable Vapors must be packaged as follows: Pack polystyrene beads or granules, expandable, evolving flammable vapor and plastic molding compound in dough, sheet or extruded rope form, evolving flammable vapor in boxes or drums as follows:

Inner packaging	Outer packaging
Sealed plastic liner	Boxes: wood (4C1 or 4C2), plywood (4D), fiberboard (4G), or reconstituted wood (4F) *or* Drums: plywood (1D) or fiber (1G) Note: Vapor tight metal or plastic drums (1A1, 1A2, 1B1, 1B2, 1H1 or 1H2) may also be used (without liner).

A13.20. Chemically Contaminated Cargo must be packaged as follows: Handle carefully, wear protective equipment when necessary. Contamination could include nerve, blister, or blood chemical agents. Take precautions (protective clothing and breathing apparatus) when handling or opening contaminated containers and working on contaminated items. Open containers in a controlled, protected, and well-ventilated area. Package contaminated items in a hermetically sealed barrier bag, placed in an open head metal drum (1A2) with an air-tight gasket. In the

absence of a hermetically sealed barrier bag, wrap and place the contaminated material in an open head metal drum with an air-tight gasket then overpack into an open head metal drum (1A2) with an air-tight gasket. The outer drum must meet PG I requirements.

Attachment 14

MARKING HAZARDOUS MATERIALS

A14.1. General Requirements.

A14.1.1. Mark hazardous materials according to MIL-STD-129 and this manual.

A14.1.2. Labels may be used to meet marking requirements to the extent they meet all application, placement, size, legibility, and durability requirements for marking.

A14.1.3. To the greatest extent possible, place packages on aircraft pallets (e.g., 463L) and within vehicles/trailers so that markings required by this attachment and labels required by **Attachment 15** are visible.

A14.1.4. When an aircraft pallet or vehicle/trailer contains like items, at least one package must have required markings/labels visible. When placement on an aircraft pallet, on a vehicle/trailer or within a freight container prevents marking and labeling to be visible, use a marking board according to A14.3.12.

A14.1.5. Use a marking board according to A14.3.12. to identify unpackaged large and robust Class 1 articles which are marked with a Proper Shipping Name authorized prior to 1 January 1990.

A14.2. UN Packaging Specification Markings. UN specification markings are mandatory for all packages of hazardous materials unless exempted by **paragraph A3.1.1** or a separate approval. A description of the codes and sequence of information contained in the UN specification marking is identified in **Table A14.1**. A sample of how the UN specification markings look is in **Figure A14.1**, **Figure A14.2** and **Figure A14.3**.

Table A14.1. UN Specification Marking Codes and Sequence of Instruction.

un	The symbol used to certify that the packaging complies with UN recommendations. For embossed metal packagings the capital "UN" can be applied as the symbol.	
4G	This is a two to four position code.	
	The first position indicates the type of packaging and will be one of the following numbers:	
		1 = Drum
		2 = Wooden barrel
		3 = Jerrican
		4 = Box
		5 = Bag
		6 = Composite packaging
		7 = Pressure receptacle

	The second position indicates the type of material that the container is made of. For composite packagings, two capital letters (second and third positions) will be used to indicate the type of materials. The first letter indicates the material of the inner receptacle and the second letter indicates the material of the outer packaging. For combination packagings, only the code for the outer packaging will be used. The following letters indicate the type of materials:	
		A = Steel (all types and surface treatments)
		B = Aluminum
		C = Natural wood
		D = Plywood
		F = Reconstituted wood
		G = Fiberboard
		H = Plastic materials
		L = Textile
		M = Paper, multi-wall
		N = Metal (other than steel or aluminum)
		P = Glass, porcelain, or stoneware
	The third position (fourth position for composite packagings) will be a number indicating the category of packaging within the same type (i.e., 1A1 [non-removable head steel drum], 1A2 [removable head steel drum], 6HG1 [plastic receptacle with outer fiber drum] 6HG2 [plastic receptacle with outer fiberboard box]). NOTE: 4A1, 4A2, 4B1, and 4B2 are obsolete UN codes, but may continue to appear as part of the markings.	
The following special codes may follow the packaging type code:		
V	Special packaging meeting the tests specified in 49 CFR §178.601(g)(2).	
W	Packaging of the same type as specified by the UN requirements, but not meeting the same general construction requirements. The transport of such packagings is subject to written approval from the competent authority. For approval see 49 CFR §178.601(h).	
X1.4 or X15	Identified first is the PG the configuration has been successfully tested too. X is used for PG I. Y is used for PG II. Z is used for PG III. Items of a lesser (less hazardous) PG may be packaged in a packaging that has been tested to a higher PG provided the requirements of the test report are complied with. For single packagings, the relative density, rounded off to the first decimal will follow the PG, for which the container has been tested. This may be omitted when the relative density does not exceed 1.2. For packagings intended to contain solids or inner packagings, the PG will be followed by the maximum gross weight, in kilograms, that the packaging configuration has been tested.	

100 or S	For single packagings intended to contain liquids, the next marking indicates the maximum test pressure, in kPa, rounded down to the nearest 10 kPa which the container was tested (hydraulic test). For packagings intended to contain solids or inner packagings, use the letter “S.” For air shipment of packagings intended to contain inner packagings, see A3.1.7.1. Also, if the inner packaging is plastic ensure the requirements of A3.1.3. are met.
11	The last two digits of the year during which the packaging was manufactured. Packagings of types 1H1, 1H2, 3H1, and 3H2 must also be marked with the month of manufacture. The month of manufacture may be marked on the packaging in a different place than the UN specification packaging marking.
USA	The country authorizing the allocation of the mark.
***	The symbol of the party responsible for ensuring that the UN requirements have been met. The symbol must be registered with the US DOT, Office of Hazardous Materials Transportation. In place of a symbol, the in-the-clear name of the party responsible for ensuring the UN requirements have been met can be used. The Department of Defense uses the symbol "DOD."
Reconditioned packagings must be marked to indicate they have been properly reconditioned. This marking must be applied near the initial marking and must replace the country and symbol of the party responsible for ensuring the UN requirements have been met, or be in addition to the initial marking. After reconditioning a packaging, the reconditioner must apply the following markings in sequence:	
USA	The country in which the reconditioning was conducted.
***	The name or registered symbol of the reconditioner.
93	The year the packaging was reconditioned.
R	Enter the letter "R."
L	Enter the letter "L" for every packaging successfully passing the leakproofness test.

Figure A14.1. Sample of UN Non-bulk Specification Packaging Marking for Solids.

Example of a Single or Combination Marking:

a b c d e f g h

un **4G / Y 7.4/ S /99/USA /DOD**

(a) The United Nations Symbol
(b) Type of Packaging Code
(c) Packing Group:

X = PG I, II and III
Y = PG II and III
Z = PG III Only

(d) Maximum Gross Mass (In Kilograms)
(e) Letter "S" , Solid or Inner Packagings
(f) Year of Manufacture or assembly
(g) State (Country) authorizing mark
(h) Symbol of Manufacturer/Certifier

Figure A14.2. Sample of UN Non-bulk Specification Packaging Marking for Liquids.

Example of marking for single packaging to contain liquid:

a b c d e f g h

un 1A1 / Y 1.3 / 100 / 99 / USA / DOD

(a) The United Nations Symbol
(b) Type of Packaging Code
(c) Packing Group:

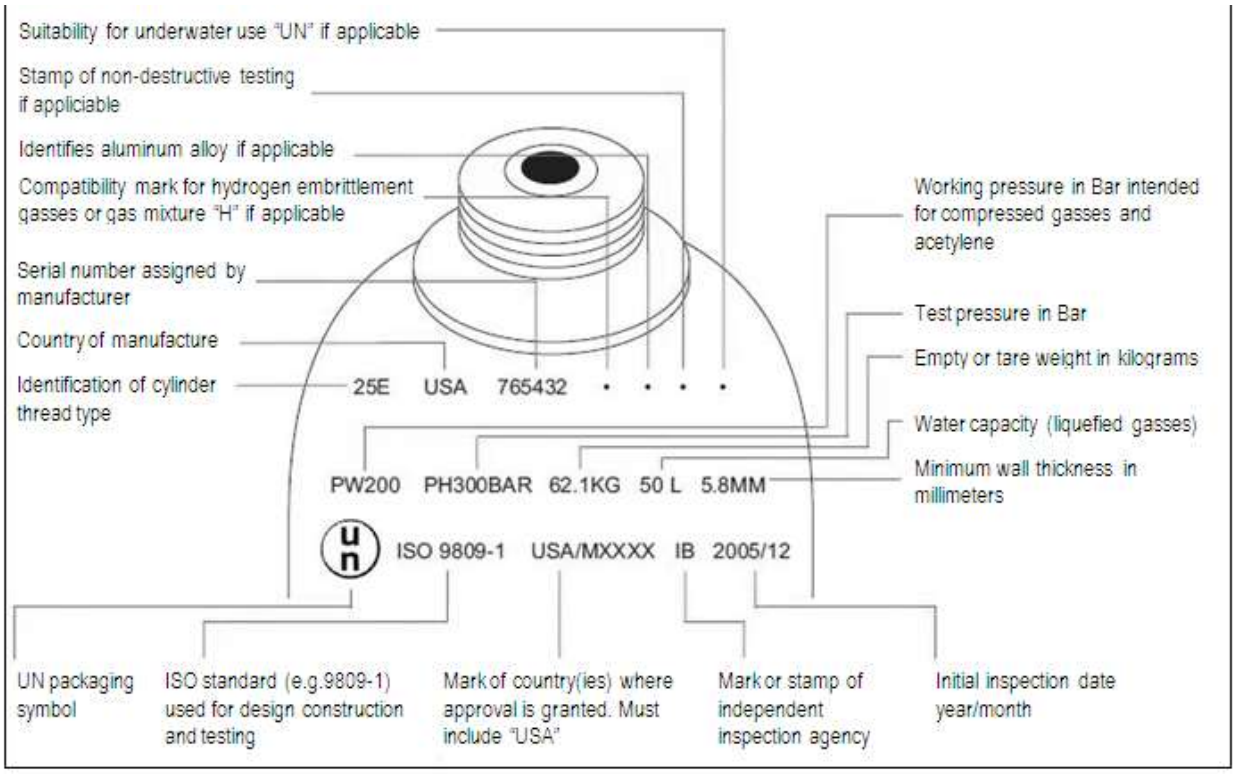
X = PG I, II, III
Y = PG II and III
Z = PG III Only

(d) Relative Density (Show if > 1.2)
(e) Test Pressure (in Kilopascals) Ref: A 3.1.7.2

PG I – not less than 250 kPa
PG III (Hazard class 3 or 6.1) – not less than 80 kPa
All others – not less than 100 kPa (example is PG II or PG III Haz Class 8)

(f) Year of Manufacture or assembly
(g) State (Country) authorizing mark
(h) Symbol of Manufacturer

Figure A14.3. Sample of UN Specification Marking for UN Pressure Receptacles.



A14.3. General Hazard Communication and Handling Markings.

A14.3.1. Proper Shipping Name and Identification Number. Unless otherwise specified, mark all packages, including overpacks, containing hazardous materials with the PSN and identification number shown in the alphabetical listing of items in **Table A4.1**.

A14.3.1.1. Unless excepted by this attachment, articles not requiring packaging will have the PSN and identification number displayed on the item itself or on a cradle, handling, storage or launching device.

A14.3.1.2. Mark the appropriate technical name in parenthesis following the proper shipping name when required by A4.5.3.

A14.3.1.3. Italicized descriptive words (see A4.5.3.) used as part of the PSN are optional.

A14.3.1.4. Secondary hazards do not require marking.

A14.3.1.5. Do not use abbreviations (except "w" (with), "w/o" (without), and "ORM" [other regulated material]).

A14.3.2. Hazardous Substance. Mark all packages containing a hazardous substance with the letter "RQ" in association with the PSN. If the PSN does not identify the hazardous substance by name, mark one of the following descriptions on the package , in parentheses, in association with the PSN:

A14.3.2.1. The technical name of the hazardous substance.

A14.3.2.2. The waste stream number.

A14.3.2.3. The letters “EPA” followed by the word “ignitability,” “corrosivity,” “reactivity,” or “EP toxicity,” as appropriate, or the corresponding “D” number, as appropriate.

A14.3.3. Hazardous Waste. Mark hazardous waste shipments according to this manual, 49 CFR Part 172, 40 CFR §262.32, and MIL-STD-129. Proper Shipping Name does not require the word “waste” if the package bears the EPA markings as prescribed in 40 CFR §262.32.

A14.3.4. Inhalation Hazard. Mark each package containing any material that is poisonous by inhalation "Inhalation Hazard." The marking is not required if the words “INHALATION HAZARD” appear on the label.

A14.3.5. Permits, CAAs, and COEs. Mark each package authorized by a DOT Special Permits, or a COE with permit or COE number. CAAs must be marked with the approval number in association with the PSN and ID number, if required by the CAA. A package marked with a DOT Exemption number (e.g., “DOT E-4368”) is authorized in place of a Special Permit number provided use is allowed by the accompanying Special Permit document required by **paragraph 2.4**.

A14.3.6. Air Eligible Marking.

A14.3.6.1. Mark the outer container of a combination package containing liquid hazardous material "Air Eligible" to verify the inner containers meet internal pressure requirements of A3.1.7.1.

A14.3.6.2. Mark "Air Eligible" on outer containers used to meet pressure requirements of A3.1.7.3., if air eligibility is not already identified by the UN specification marking.

A14.3.6.3. Mark “Air Eligible” on overpacks of one or more air eligible combination, single or composite packaging containing liquid hazardous material (see **A3.1.7**).

A14.3.6.4. Commercial marking/labeling to indicate air eligibility (e.g., “AIR APPROVED”, “AIR AUTHORIZED”, etc.) of combination packages may be used in lieu of above wording, provided package also meets all other air eligibility requirements of this manual (e.g., pressure requirements, absorbent material, etc.).

A14.3.7. Orientation Marking (This Side Up). Pack inside containers used to ship liquid hazardous material within a combination packaging or overpack with filling holes up.

A14.3.7.1. Mark with orientation arrows meeting the requirements of 49 CFR §172.312, on two opposite sides of the package or overpack and ensure the arrows point in the correct upright direction. Orientation labels may be used to meet this marking requirement. The lettering "THIS SIDE UP", "THIS END UP" or "UP" must be used in conjunction with orientation labels.

A14.3.7.2. This requirement does not apply to materials in inside metal cans of the nonrefillable type with spun-in head and base without replaceable caps or other closing device, liquids contained in manufactured articles which are leak-tight in all orientations, and packages with hermetically-sealed inner packagings.

A14.3.7.3. Orientation Markings are not required for single packaging when package orientation is obvious (e.g., drums, barrels, etc) or on freight containers.

A14.3.8. When an overpack (generally wooden or fiberboard) is used to consolidate one or more air eligible packages to form a single unit for convenience of handling or storage during transportation, apply markings required by this manual for individual containers, with the exception of UN specification markings. Also, mark "OVERPACK" on the outer container.

A14.3.9. Freight Containers. Freight containers do not require PSN and UN numbers of the contents. However, they must be accessible (see **paragraph 1.11**) and be labeled to indicate the hazard class/division of the contents, and if the contents are cargo aircraft only in accordance with **Attachment 15**. A marking board may be used in lieu of applying markings directly to the freight container. (see **A14.3.13**).

A14.3.10. Chemically Contaminated Cargo. Mark chemically contaminated cargo shipped under the authority of **paragraph 3.7** with the words, "Contaminated - Do Not Open." Apply by any means that is visible and legible.

A14.3.11. Unitized Cargo. Identical hazardous materials unitized on a warehouse pallet or skid must have at least one package with the UN specification markings exposed on the outside of the unit load (unless exempt by **paragraph A3.1.1**).

A14.3.12. Shrink Wrap Packages. When stretch or shrink wrap film is used to secure a warehouse pallet or skid, ensure proper shipping name, identification number, and UN specification markings (if applicable) are visible. Use pressure-sensitive labels or a marking board to identify contents if proper shipping name and identification number markings are not visible on one or more packages. If UN specification markings are not visible on at least one of like packages, comply with **A14.3.8**.

A14.3.13. Marking Boards. Marking boards (wood, fiberboard, tags, etc.) may only be used in lieu of individual package markings required by this attachment and labels required by **Attachment 15** for items on warehouse pallets/skids prepared according to Service approved unit load drawings under both the following conditions:

A14.3.13.1. When it is determined to be impractical or uneconomical to mark/remark each package on a pallet or skid.

A14.3.13.2. The entire pallet/skid will not be broken down at any time during transportation until delivery to the customer.

A14.3.14. Limited Quantities. In addition to proper shipping name and UN identification number, and other markings required by this attachment, mark packages used for hazardous materials in limited quantities as required by this section. The marking "Limited Quantity" or "LTD QTY" may be used until 31 December 2011. The following limited quantities marking may be used currently, and is required after 1 January 2012.

Figure A14.3. Limited Quantity Marking.

A14.3.14.1. The marking must be durable, legible and of a size relative to the package as to be readily visible. The marking must be applied on at least one side or one end of the outer packaging. The width of the border forming the square-on-point must be at least 2 mm and the minimum dimension of each side must be 100 mm unless the package size requires a reduced size marking that must be no less than 50 mm on each side.

A14.3.14.2. The top and bottom portions of the square-on-point and the border forming the square-on-point must be black and the center white or of a suitable contrasting background and the symbol "Y" must be black and located in the center of the square-on-point and be clearly visible.

A14.3.15. Excepted Quantities. Mark packages used for hazardous materials in excepted quantities as required by A19.2.13. Excepted quantities do not require other package markings required by this attachment.

A14.3.16. Consumer Commodity and ORM Markings. Plainly, durably, and legibly mark each package containing a hazardous material meeting the definition of Consumer Commodities and classified as ORM-D with "ORM-D-AIR" until December 31, 2012. Place the marking on at least one side or end immediately following or below the PSN within a rectangle that is approximately 6.3 mm (1/4 inch) larger on each side than the ORM designation. Use the ORM designation for domestic shipments only. After 31 December 2012, the consumer commodity designation may not be used.

A14.3.17. Consumer Product Warnings. An article, package, or container may bear a manufacturer's consumer warning symbol or statement. Presence of such a symbol or statement does not necessarily mean the article or contents meet the classification criteria as a hazardous material for military air transportation. Reference the Hazardous Material Information Resource System (HMIRS) or the product's Material Safety Data Sheet if hazard classification information is needed.

A14.4. Marking Requirements Applicable to Class.

A14.4.1. Class 1.

A14.4.1.1. Containers packaged before January 1, 1990 may be shipped both domestically and internationally by military air without the UN specification markings according to **paragraph A3.3.1.10**. Comply with all other marking requirements of this attachment. Ensure packages requiring a DOT or military/federal specification number specified by packaging paragraph in **Attachment 27** are properly marked.

A14.4.1.2. Mark packages of explosives with an EX number or National Stock Number (as listed in the Joint Hazard Classification System) for each explosive. This does not apply if the explosive has an interim hazard classification issued according to **A3.3.1.4**. The EX number need not be marked when not required by 49 CFR §173.56. The EX number is an explosive classification approval number, it is not the same as a DOT-SP number.

A14.4.1.3. Mark "THIS SIDE UP" on the top of packages of explosives containing liquids.

A14.4.1.4. When explosives are installed according to **A3.**3.1.9., mark the following statement near each explosive device: "WARNING - EXPLOSIVE DEVICE EMBEDDED IN ***" (*** identifies location of device; i.e., window, door, frame, etc).

A14.4.1.5. Explosives authorized by this manual to be shipped unpacked, must display the PSN and UN number. That marking may be on the item, its cradle, or handling, storage, or launching device. This marking is not required for items hand-carried (see **paragraph 3.5**), unpackaged for airdrop (see **A5.2.1**), or secured in a tactical vehicle or equipment (see **A5.2.2**).

A14.4.1.6. For Grandfathered shipments, mark packages with DOT or military/federal specification number when specified by packaging paragraph in **Attachment 27**.

A14.4.2. Class 2.

A14.4.2.1. For ethylene oxide prepared and certified according to **A6.13.4**, mark the top head of the drum "THIS END UP."

A14.4.2.2. Mark fire extinguishers prepared and certified according to **A6.7.3** to indicate year of test and "MEETS DOT REQUIREMENTS." The words "This extinguisher meets all requirements of 49 CFR §173.306" may be displayed in place of "MEETS DOT REQUIREMENTS" on extinguishers manufactured before January 1, 1976.

A14.4.2.3. Each outer packaging of cryogenic liquids prepared and certified according to **A6.11** must have arrows to indicate upright position and must be marked "KEEP UPRIGHT" and "DO NOT DROP." Hydrogen, cryogenic liquid must meet the marking requirements in 49 CFR §178.57. The total rate of venting in standard cubic feet per hour (SCFH) must be marked on the top head or valve protection band in letters at least one-half inch high as follows "VENT RATE**SCFH" (with the asterisks replaced by the number representing the total rate of venting, in SCFH).

A14.4.2.4. Mark outer package “INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS” for the following:

A14.4.2.4.1. Nitric oxide prepared and certified according to **A6.20** and the DOT 3A, 3AA, 3AL, or 3E1800 cylinders that are overpacked.

A14.4.2.4.2. Aerosols and compressed gases prepared and certified according to **A6.2**.

A14.4.2.4.3. Refrigerant gases or engine-starting fluid prepared and certified according to **A6.4.6** and **A6.4.7**.

A14.4.2.4.4. Receptacles and cylinders identified in **A3.3.2.7** requiring a strong outer packaging.

A14.4.2.4.5. Cylinders packaged according to **A3.3.2.3.2** to protect valves from damage or accidental functioning during transport.

A14.4.2.4.6. Liquefied Petroleum Gas prepared according to **A6.6.2**.

A14.4.2.5. Aerosols (UN1950) may be marked with a PSN authorized by 49 CFR, IATA, or ICAO, not identified in **Table A4.1**.

A14.4.3. Class 3.

A14.4.3.1. When shipping flammable liquids, mark the shipping container with the flash point.

A14.4.4. Class 5.

A14.4.4.1. For bromine pentafluoride or bromine trifluoride prepared and certified according to A9.11. using a DOT 3E1800 cylinder, mark the outer packaging "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS."

A14.4.4.2. Oxygen generator, chemical. The outside surface of a chemical oxygen generator must be marked to indicate the presence of an oxygen generator (e.g., “oxygen generator, chemical”). The outside surface of equipment containing a chemical oxygen generator that is not readily apparent (e.g., a sealed passenger service unit) must be clearly marked to indicate the presence of the oxygen generator (example: “Oxygen Generator Inside”).

A14.4.5. Class 6.

A14.4.5.1. Permanently mark outside plastic containers used for toxic (poisonous materials), by embossment or other durable means, with the word "POISON" in letters of at least 6.3 mm (1/4 inch) in height. Additional text or symbols may be included in the marking. The marking must be located within 15 cm (6 inches) of the packaging's closure.

A14.4.5.2. Mark packages containing Category A infectious substances with:

A14.4.5.2.1. The UN packaging symbol.

A14.4.5.2.2. The text “CLASS 6.2”.

A14.4.5.2.3. The last two digits of the year of manufacture of the packaging.

A14.4.5.2.4. The State authorizing the allocation of the mark (i.e., USA).

A14.4.5.2.5. The name or registered symbol of the manufacturer.

A14.4.5.2.6. All packages containing infectious substances must be marked durably and legibly on the outside of the package with the name and telephone number or a person responsible for the shipment.

A14.4.5.3. For packages containing UN3373, mark outer packagings with the words “BIOLOGICAL SUBSTANCE, CATEGORY B.” and “UN3373.” The UN3373 must be within a square-on-point shaped border with each side at least 50mm (2 inches). The width of the border line must be at least 2mm, and the letters and numbers must be at least 6mm in height. The background must be of a contrasting color from the package.

A14.4.5.4. Packages containing “BIOLOGICAL SUBSTANCE, CATEGORY B” will be marked to identify name and phone number for contact in an emergency.

A14.4.6. Class 7.

A14.4.6.1. General Requirements. In addition to other markings required by this attachment, the following markings are required on all Excepted packages, Types IP-1, IP-2, IP-3, Type A, Type B(U) or Type B(M) packages:

A14.4.6.1.1. Mark each package of radioactive materials over 50 kg (110 pounds) to show the gross weight including the unit of measurement marked on the outside of the package.

A14.4.6.1.2. When dry ice is used as a refrigerant, mark the PSN, UN Number, and net quantity on the outer package.

A14.4.6.1.3. Markings will be at least 12 mm high, except for packages of 30 L or 30 kg capacity or less will have a minimum height of 6 mm.

A14.4.6.2. Excepted Packages.

A14.4.6.2.1. Mark packages containing radioactive material meeting the definition of an excepted package with “Radioactive Material, Excepted Package.” A commercial label may be used for this marking.

A14.4.6.2.2. For limited quantities prepared and certified according to A11.5.4., the package is not required to be marked with the PSN provided it is marked with the identification number preceded by the letters "UN" within a diamond.

A14.4.6.3. Industrial Packages.

A14.4.6.3.1. Mark each package of radioactive material that meets the requirements for Types IP-1, IP-2, or IP-3 packaging on the outside of the package with the words “TYPE IP-1” “TYPE IP-2” or “TYPE IP-3” as appropriate. Do not mark a package that does not meet these requirements.

A14.4.6.3.2. Mark on the outside of Type IP-1, Type IP-2, or Type IP-3 packaging with the international vehicle registration code of the country of origin of the design. The international vehicle registration code for packages designed in the United States is the symbol "USA."

A14.4.6.3.3. Mark on the outside of Type IP-1, Type IP-2, or Type IP-3 packaging with the name of the package manufacturer, or other identification markings as required by approval certificate issued by the competent authority.

A14.4.6.4. Type A Packages.

A14.4.6.4.1. Mark each package of radioactive material that meets the requirements for a Type A package with the words “TYPE A”. Do not mark a package that does not meet these requirements.

A14.4.6.4.2. Mark on the outside of Type A packagings with the international vehicle registration code of the country of origin of the design. The international vehicle registration code for packages designed in the United States is the symbol "USA."

A14.4.6.4.3. Mark on the outside of Type A packages with the name of the package manufacturer, or other identification markings as required by approval certificate issued by the NRC or the US Competent Authority.

A14.4.6.5. Type B Packages.

A14.4.6.5.1. Mark each package of radioactive material that meets the requirements for Type B(U) or Type B(M) packaging on the outside of the package with the words

"TYPE B(U)" or "TYPE B(M)" as appropriate. Do not mark a package that does not meet these requirements.

A14.4.6.5.2. Identification mark allocated to the design by the NRC or the US Competent Authority.

A14.4.6.5.3. Serial number to uniquely identify each packaging which conforms to the design.

A14.4.6.5.4. Mark each outer packaging with a trefoil radiation symbol meeting the requirements of 49 CFR Part 172 Appendix B.

A14.4.7. Class 8.

A14.4.7.1. Mark the outer container of chemical kits prepared and certified according to A12.6. "CHEMICAL KITS" or "FIRST AID KITS" as applicable.

A14.4.8. Class 9.

A14.4.8.1. Wheelchairs for which the battery is removed and boxed for shipment according to A13.6., mark the outer container containing the battery "THIS SIDE UP." This applies any time a battery is authorized to be removed from its holder, boxed, and shipped with equipment.

A14.4.8.2. Unless packaged, crated, or otherwise enclosed to prevent ready identification, the marking of the article or equipment of Class 9 with the proper shipping name and identification number is not required.

A14.4.8.3. Dangerous Goods in Machinery or Apparatus. For items shipped under the PSN “Dangerous Goods in Machinery” or “Dangerous Goods in Apparatus” mark the PSN and UN number on the machinery, apparatus, or packaging (unless exempted by A14.4.8.).

A14.4.8.4. Dry Ice. For checked baggage, mark package with “DRY ICE” or “CARBON DIOXIDE, SOLID” and net mass, or an indication the net mass is less than 2.5 kg (5.5 pounds). For all other packages, mark the outer package with "DRY ICE" or "CARBON DIOXIDE SOLID," "UN1845," and the net mass of the dry ice.

A14.4.8.5. Excepted Lithium Batteries. Lithium metal cells and batteries (UN3090) are forbidden for transport aboard passenger-carrying aircraft by 49 CFR for commercial air transportation. Mark the outer container(s) “LITHIUM METAL BATTERIES – FORBIDDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT” to be eligible for both commercial and military aircraft. Markings do not prohibit the movement of passengers on military or contracted cargo aircraft.

Attachment 15

LABELING HAZARDOUS MATERIALS

A15.1. General Requirements. Unless otherwise specified in this manual, apply the appropriate labels to the outer packaging of packages containing hazardous materials.

A15.1.1. Use labels meeting the commercial color and specifications outlined in 49 CFR §172.411 through §172.450, ICAO, or IATA. Do not use labels that are easily confused by their use, shape, and color, with the standard labels prescribed.

A15.1.2. Labels must be diamond-shaped with each side at least 10 cm (4 inches) long and have a solid line border 6.3 mm (0.25 inches) from the edge. “UN3373” labels may be 5 cm (2 inches) long.

A15.1.3. The hazard class and division number must be at least 6.3 mm (0.25 inches) and not greater than 12.7 mm (0.5 inches). The label text must be at least 7.6 mm (0.3 inches) and will be in capitalized Roman letters.

A15.1.4. It is the shipping activity's responsibility to establish procedures to locally fund for and procure hazardous material labels and commercial forms.

A15.1.5. Secondary hazards do not require labels.

A15.1.6. Comply with **paragraph 1.10.8** to ensure visibility of hazard labels during transportation. If hazard labels required by this attachment are not visible due to placement (located in the middle of an aircraft pallet, cargo bed covered by a tarp , within a freight container, etc), apply required labels to a marking board placed/attached to identify presence of each hazard classification.

A15.2. Hazard Labels.

A15.2.1. Affix to the outer packaging or (overpack) a primary hazard label and a subsidiary risk label(s) (if required) based on the hazard classification/subsidiary risk provided in columns 4 and 5 of **Table A4.1** unless exempted by A15.4. Include the hazard class or division number in the bottom corner of the label(s). Labels that do not have the class or division number preprinted may be stamped or overprinted with the appropriate hazard class/ division number in the bottom corner of the label.

A15.2.1.1. For explosives, include the division number and compatibility group letter. Ensure the compatibility group letter is a capitalized Roman letter.

A15.2.1.2. For Division 5.1 oxidizers and Division 5.2 organic peroxides, include the division number in the bottom corner of the label.

A15.2.2. Unless otherwise directed in this manual, attach labels to the part of the package bearing the PSN if package size is adequate. If package size is not adequate, use an overpack. Packages requiring a Radioactive Material label ("Category I-White", "Category II-Yellow" or "Category III-Yellow") will be labeled on opposite sides.

A15.2.3. Do not place labels over any identifying data on the container. Remove or obliterate any irrelevant labeling already on the packaging.

A15.2.4. When hazardous materials are placed in an overpack, the appropriate primary hazard label, subsidiary hazard label(s) and handling label(s) for each class must be applied to the outer package or container. If the primary hazard or subsidiary risk label(s) of another component of the overpack already adequately identifies a primary or subsidiary risk it is not necessary to apply an additional label.

A15.2.5. When hazardous materials are palletized on a 463L or warehouse pallet, ensure the label is clearly visible.

A15.2.6. Position hazardous cargo loaded in the back of a vehicle so the labels are clearly visible, or apply the labels for each hazard loaded in the back of the vehicle to a marker board that is clearly visible.

A15.2.7. Label each Limited Quantity package for each dangerous good contained in the package.

A15.2.8. Excepted Quantities do not require hazard labels. See A19.2.3 for package marking requirements.

A15.2.9. Label hazardous waste with the appropriate hazard label and properly completed hazardous waste label.

A15.2.10. For items shipped under the PSN "Dangerous Goods in Machinery" or "Dangerous Goods in Apparatus" apply Package Orientation (This Way Up) labels to opposite vertical sides when required to ensure liquid hazardous materials remain in their intended orientation. If machinery or apparatus contains a magnetized material apply both a Class 9 (Miscellaneous) and a "Magnetized Material" label.

A15.2.11. A label(s) is not required for domestic shipments when use is exempted by a DOT special permit. For international shipments, the correct label(s) must be applied.

A15.2.12. Do not apply hazard labels to a package containing material that is not regulated.

A15.2.13. Labels required by this attachment for individual packages will be applied directly to stretch or shrink wrapping used or to a marking board (A14.3.12). Orientation labels are not required if stretch or shrink wrap prevents incorrect loading of packages/containers.

A15.3. Handling Labels.

A15.3.1. Apply a "Cargo Aircraft Only" label on packaging (to include overpacks) not permitted on passenger aircraft as identified in column 7 of **Table A4.1**. Also apply to marking boards according to A15.1.6., when applicable, if label is not visible. The “Cargo Aircraft Only” label conforming to the specifications in 49 CFR §172.448 on December 31, 2008 may be used until January 1, 2013.

A15.3.2. The "Cargo Aircraft Only" label is not required on cargo shipped according to A17.3 unless diverted as identified in A17.3.5.

A15.3.3. Apply a "Magnetized Material" label on packages containing magnetized material. An additional Class 9 label is not required. Also apply to marking boards according to A15.1.6., when applicable, if label is not visible.

A15.3.4. Apply an "Empty" label when the packaging meets the requirements of paragraph A3.1.16. Any container or cylinder shipped as empty must have the previously applied

hazard labels removed, obliterated, destroyed, or completely covered by the "EMPTY" label. New or reconditioned cylinders do not require an "Empty" label but must be marked or tagged to indicate they are empty.

A15.3.5. Apply "Keep Away From Heat" label to each outside package containing self-reactive substances of Class/Division 4.1 or organic peroxides of Class/Division 5.2.

A15.3.6. Labels required by 49 CFR, ICAO, or IATA may be affixed even if not required by this manual.

A15.3.7. A marking board may be used in lieu of applying a handling label(s) directly to a freight container (see A14.3.12).

A15.4. Labeling Requirements Applicable to Hazard Classes.

A15.4.1. Class 1. Explosives labels will be applied to the same side as the nomenclature markings if the Service approved SPI or drawing directs the PSN to be marked on the top of the shipping container. For unitized, containerized, or palletized loads of like items with the same hazard classification, division and compatibility group, only one of the required hazard label(s) must be applied and visible.

A15.4.2. Class 2.

A15.4.2.1. For packages containing oxygen, compressed; or oxygen, refrigerated liquid, a label with the word "OXYGEN" may be used in place of a label with the word "OXIDIZER," if the letter size and color are the same as those required for oxidizer. Alternatively, an "OXYGEN" label may be used in place of the "NONFLAMMABLE GAS" and "OXIDIZER" labels required in **Table A4.1**.

A15.4.2.2. Recoil mechanisms or artillery gun mounts prepared and certified according to A6.5.13., must have a nonflammable compressed gas label applied to each exterior container. However, when shipped as an integral part of the complete weapon system, the nonflammable compressed gas label may be on the weapon or its exterior cover.

A15.4.3. Class 3. All flammable liquids, whose vapor pressure (Reid test) is more than 110 kPa (16 psi) at 38 degrees C (100 degrees F), must have a "white bung label," 76 x 127 mm (3 by 5 inches), affixed near the bung or closure of the container.

A15.4.4. Class 4. A division 4.1 subsidiary hazard label is not required on a package bearing a division 4.2 label.

A15.4.5. Class 6.

A15.4.5.1. Label PG I or II material with either a "TOXIC" or "TOXIC INHALATION HAZARD" label as appropriate.

A15.4.5.2. Label hazard zone A or B material with a "TOXIC INHALATION HAZARD" label.

A15.4.5.3. Material classified as an infectious substance, that also meets the definition of a Class 2.3 toxic material or a radioactive material, must also be labeled with a "TOXIC GAS" (or INHALATION HAZARD) label or "RADIOACTIVE" label as appropriate.

A15.4.5.4. Label all Category A infectious substance packagings with an "INFECTIOUS SUBSTANCE" label.

A15.4.6. Class 7.

A15.4.6.1. Hazard Label. Each package requiring a "RADIOACTIVE" label must have two of these labels affixed to opposite sides of the package. The proper label to affix to a package of radioactive material is based on the radiation level at the surface of the package and the transport index. The proper category of label is determined according to **Table A15.1**. The first step is to determine the maximum radiation level at a distance of 1 meter from the external surfaces of the package, overpack or freight container, the value determined must be multiplied by 100. The final step is the figure obtained in step 1 must be rounded up to the first decimal place, except that a value of 0.05 or less may be considered as zero. Apply the highest category label required for any of the two determining conditions. Radioactive Category I-White is the lowest category and Category III-Yellow is the highest. For example: a package with a transport index of 0.8 and a maximum surface radiation level of 0.6 mSv/h (60 mrem/h) must bear a Category III-Yellow label (see **Table A15.1**)

Table A15.1. Radioactive Label Requirements. (See Note 1).

Transport Index (TI)	Maximum Radiation Level at any Point on the External Surface	Label Category
0 (see Note 1)	Less than or equal to 0.005 mSv/h (0.5 mrem/h)	I - White
More than 0 but not more than 1 (see Note 2)	More than 0.005 mSv/h (0.5 mrem/h) but less than or equal to 0.5 mSv/h (50 mrem/h)	II - Yellow
More than 1 but not more than 10	More than 0.5 mSv/h (50 mrem/h) but less than or equal to 2 mSv/h (200 mrem/h)	III - Yellow
More than 10 (see Note 3)	More than 2 mSv/h (200 mrem/h) but not more than 10 mSv/h (1000 mrem/h)	III – Yellow

NOTES:

1. The category of label must be shown in Key 17 of the Shipper's Declaration for Dangerous Goods form and must also be applied to radioactive materials packages. Any package containing a "highway route controlled quantity" must be labeled as radioactive Category III-Yellow.
2. If the measured TI is not greater than 0.05, the value quoted may be zero.
3. If the TI is greater than 10, the package or overpack must be transported by SAAM airlift only (see Attachment 24)

A15.4.6.2. Subsidiary Risk Label. Label each package containing a radioactive material that also meets the definition of one or more additional hazards, as required by this attachment for the radioactive material and for each additional hazard. For example, label solid nitrates of uranium or thorium, "RADIOACTIVE" and "OXIDIZER." Subsidiary risk labels are not required for an uncompressed gas that is non-flammable and non-toxic.

A15.4.6.3. Label Marking. The contents, activity, and for Category II and III yellow labels, the transport index must be marked on the label. Additionally, the CSI must be marked on the CSI label. Enter the following information in the blank spaces by legible printing (manual or mechanical), using a durable weather resistant means of marking:

A15.4.6.3.1. Contents. Mark the contents as follows:

A15.4.6.3.1.1. Except for LSA-I material, the symbol of the radionuclide as listed in **Table A11.1**. Symbols that conform to established radiation protection terminology are authorized, (i.e., ^{99}Mo, ^{60}Co, etc).

A15.4.6.3.1.2. For mixtures of radionuclides, or for different individual radionuclides packed together in the same package, the most restrictive radionuclides must be listed to the extent that space on the line permits.

A15.4.6.3.1.3. LSA (except LSA-1) or SCO must have the symbol of the radionuclide followed by "LSA-II", "LSA-III", "SCO-I", "SCO-II" as appropriate.

A15.4.6.3.1.4. For LSA-I material, only "LSA-I" is required to be marked.

A15.4.6.3.2. Activity. Express units in appropriate international units of Becquerels (Bq) or Terabecquerels (TBq). The customary units, i.e., curies (Ci), millicuries (mCi), or microcuries (uCi) may be included in parenthesis following the international units. Abbreviations are authorized. For a fissile material, the weight in grams or kilograms of the fissile radioisotope also may be inserted.

A15.4.6.3.3. Transport Index (TI). For Category II and Category III yellow labels only, the Transport Index must be marked in the box provided. It must be rounded up to one decimal place (see **Attachment 1**).

A15.4.6.3.4. Criticality Safety Index (CSI).

A15.4.6.3.4.1. The Criticality Safety Index label must be marked with the CSI as stated in the certificate of approval for special arrangement or the certificate of approval for the package design, issued by the NRC or the US Competent Authority, in the box provided.

A15.4.6.3.4.2. For overpacks and freight containers, the CSI on the label is the sum of the criticality safety indexes of the individual packages in the freight container or overpack as stated in the certificate of approval for the package design issued by the NRC or the US Competent Authority.

A15.4.6.3.5. Overpacks and Freight Containers. When one or more packages of radioactive material are placed within an overpack, the overpack must be labeled as prescribed in this paragraph except as follows:

A15.4.6.3.5.1. The content entry on the label may state "See Shipper's Declaration" in place of the names of the radionuclides unless each inside package contains the same radionuclide(s).

A15.4.6.3.5.2. The activity entry on the label must be determined by adding together the number of becquerals of the radioactive materials packages contained in the overpack.

A15.4.6.3.5.3. For an overpack, the TI must be determined by adding together the transport indexes of the radioactive materials packages contained in the overpack. For a rigid overpack, the TI may alternatively be determined by direct measurement as prescribed in this paragraph; however, it must be taken by the

person who initially offered the packages contained within the overpack for shipment.

A15.4.6.3.5.4. The category of Class 7 label for the overpack must be determined from **Table A15.1** using the TI derived from the requirements in this paragraph and the maximum surface radiation level on the surface of the overpack.

A15.4.6.3.5.5. The category of the Class 7 label of the overpack and not that of any contained packages must be used in accordance with Table 1 of 49 CFR §172.504(e) to determine when the transport vehicle must be placarded.

A15.4.7. Class 8.

A15.4.7.1. Wet-cell batteries prepared and certified according to A12.4. must have "Package Orientation" labels indicating the upright position (top) of the container, if not already marked on the container as specified in A14.3.6.

A15.4.7.2. Label Chemical or First Aid Kits prepared in accordance with A12.6. with the primary hazard label and any subsidiary risk labels applicable to each individual hazard within the kit.

A15.4.7.3. Packages displaying a Class 8 label need not display a Division 6.1 subsidiary hazard label if the toxicity of the material is based solely on the corrosive destruction of tissue rather than systematic poisoning.

A15.4.8. Class 9.

A15.4.8.1. Vehicles and equipment do not require a label unless packaged, crated, or otherwise enclosed to prevent ready identification.

A15.4.8.2. Certify items containing both limited quantity radioactive and magnetic characteristics to the radioactive material. Although limited quantity radioactive material is exempt from labeling, a magnetic material label must be applied to the shipping container.

A15.4.8.3. Excepted Lithium batteries. Packages containing excepted lithium cells or batteries. Place commercial “CAUTION” Lithium Battery Handling label (minimum 120 X110 mm) on containers. Color of label must be black with red hatching on a contrasting background.

Attachment 16

AREA PLACARDING

A16.1. General Requirements. Placard the area surrounding aircraft transporting any hazardous materials when parked according to **Table A16.1** or Service directives. If Service directives do not contain specific procedures for placarding, use the following guidance:

A16.1.1. Use placards that meet the general design, size, and color specifications of 49 CFR §172.519.

A16.1.2. For explosives, fire and chemical hazard symbols specified in DOD 6055.9-STD may be used in place of placards.

A16.1.3. Conspicuously display placards at the front, rear, and both sides of the aircraft unless emergency response access is restricted. Then post placards at entry points.

A16.1.4. Park aircraft transporting DOD Class 1.1, 1.2, and 1.3 explosives and any material identified as Inhalation hazard zone A in a remote area. Placarding is still required for these materials when parked in a designated restricted, posted, and traffic controlled parking or loading and unloading area.

A16.1.5. Park aircraft transporting all other types of hazardous materials in a placarded area. However, placarding is not required for these materials when parked in a designated restricted, posted, and traffic controlled parking or loading and unloading area.

A16.2. Responsibility for Placards.

A16.2.1. Military hosts are responsible for placarding at military bases.

A16.2.2. At nonmilitary airfields, the agency delivering cargo to the aircraft, or off loading cargo is responsible for making arrangements with the airport manager for identifying the cargo, isolating parking and loading, placarding, firefighting, and disaster response. Arrangements for using en route nonmilitary airfields is the responsibility of the activity having operational control of the aircraft.

A16.2.3. It is the shipping activity's responsibility to establish procedures to locally procure and fund for hazardous material placards.

A16.2.4. The nomenclature of the placards is shown in **Table A16.1**.

Table A16.1. Placard Requirements.

Placards Required for Parked Area Aircraft Containing Hazardous Cargo		
Hazard Class or Division – Placard for Any Quantity		Type of Placard
	1.1	EXPLOSIVES 1.1
	1.2	EXPLOSIVES 1.2
	1.3	EXPLOSIVES 1.3
	2.3	TOXIC GAS
	4.3	DANGEROUS WHEN WET

	5.2 (Organic peroxide, Type B, liquid	ORGANIC PEROXIDE
	or solid temperature controlled)	
	6.1 (Inhalation hazard Zone A or B)	TOXIC INHALATION HAZARD
	7 (Radioactive Category III-Yellow label only)	RADIOACTIVE
Hazard Class or Division - (Placard for 1,001 pounds or more aggregate gross weight)		Type of Placard
	1.4	EXPLOSIVES 1.4
	1.5	EXPLOSIVES 1.5
	1.6	EXPLOSIVES 1.6
	2.1	FLAMMABLE GAS
	2.2	NONFLAMMABLE GAS
	3	FLAMMABLE
	4.1	FLAMMABLE SOLID
	4.2	SPONTANEOUSLY COMBUSTIBLE
	5.1	OXIDIZER
	5.2 (Other than organic peroxide, Type B,	ORGANIC PEROXIDE
	liquid or solid, temperature controlled)	
	6.1 (other than inhalation hazard,	TOXIC
	Zone A or B)	
	6.2	NONE REQUIRED
	8	CORROSIVE

NOTES:

1. Use the explosive placard representing highest hazard. For example, if the area contains both Class 1.1 and 1.2, use the Explosive 1.1 placard. Otherwise, placard for each hazard or comply with note 3 below.

2. The aggregate gross weight is the total gross weight of the compatible packages comprising the shipment or different shipments of the same classification.

3. For those hazard classes located in the lower portion of the table, placarding is not required if the aggregate gross weight of the packages of those classes is less than 454 kg (1001 pounds). A "DANGEROUS" placard may be used in place of the separate placards for two or more categories of hazardous material found in the lower portion of the table. When 1000 kg (2205 pounds) or more of one category of material from the lower portion of the table is loaded, the specific placard for that material is required, and a "DANGEROUS" placard may not be used to represent that material.

Attachment 17

CERTIFYING HAZARDOUS MATERIALS

A17.1. Shipper's Certification. Unless specifically exempted in this manual, the shipping activity must complete a shipper's certification according to this attachment for all military air shipments of hazardous materials.

A17.1.1. Certifying Official.

A17.1.1.1. An individual qualified according to A25.3. must inspect the hazardous materials prior to accomplishing the Shipper's Declaration for Dangerous Goods form.

A17.1.1.2. When transportation personnel are required to certify an item that requires special preparation (munitions, engines, etc), the item specialist or preparing activity will provide documentation indicating that the item is prepared properly for air shipment. Develop local procedures to determine acceptable documentation.

A17.1.2. Certification Reference. Certify hazardous materials to a packaging reference in this manual. Hazardous material may be certified to the ICAO, IATA, or Title 49 CFR under the following conditions:

A17.1.2.1. Comply with all requirements of the certifying document.

A17.1.2.2. Shipments must be certified to this manual if:

A17.1.2.2.1. The passenger quantity limitations of the certifying document are exceeded.

A17.1.2.2.2. The PSN in **Table A4.1** has other than a “P5” Special Provision Code.

A17.1.2.2.3. The material is forbidden on a passenger aircraft by the certifying document.

A17.1.2.2.4. The item is a vehicle or wheeled SE.

A17.1.2.2.5. The item is a non-DOT approved compressed gas cylinder, pressure vessel or fire extinguisher.

A17.1.2.3. Comply with requirements in **Attachment 20** for absorbent material in combination packages containing liquid hazardous materials.

A17.1.2.4. See A17.2.6. for multiple mode shipments.

A17.2. Shipper’s Declaration for Dangerous Goods Certification.

A17.2.1. Forms Required. Complete shipper's certification on the "Shipper's Declaration for Dangerous Goods" standard commercial form. Two styles of the commercial form may be used. One style is designed with the "Nature and Quantity of Dangerous Goods" section left open for continuous printing. The other style is designed in a columnar format with the "Nature and Quantity of Dangerous Goods" section blocked and formatted with headings specifying each key entry (**Figure A17.1**). It is the shipping activity's responsibility to establish procedures to locally procure and fund for the Shipper’s Declaration for Dangerous Goods form.

A17.2.1.1. Obtain the form through the procurement system from commercial vendors specializing in hazardous material transportation supplies.

A17.2.1.2. The form may be locally produced depending on local capabilities and economic feasibility.

A17.2.1.3. The form must meet the format, size, and color specifications outlined in IATA, Section 8-*Documentation.*

A17.2.2. Copies Required. Complete and sign at least three Shipper's Declaration for Dangerous Goods forms.

A17.2.2.1. Attach one certification form to the copy of the manifest that is placed on the aircraft.

A17.2.2.2. Attach one certification form to the originating station file manifest. Intransit or enroute terminals may reproduce (photocopy) the Shipper's Declaration for Dangerous Goods form for their station file if required.

A17.2.2.3. Place one certification form in a waterproof envelope and attach to the number one piece of the shipment.

A17.2.2.4. The three original forms used to offer hazardous material for military air transportation must have the vertical red hatch border and certifying official's signature. Carbon signatures are acceptable.

A17.2.2.5. Additional copies may be forwarded with the shipment. Vertical red hatch border is not required for any additional copies.

A17.2.3. Form Completion. Complete the Shipper's Declaration for Dangerous Goods form either manually (hand printed), mechanically (typewriter), or digitally (computer). The form may be completed by a combination of manual, mechanical, and digital means, as required, providing all entries are clear and legible. However, when possible, the shipping activity should complete the form entirely manually, mechanically, or digitally. Incorrect punctuation, spelling (other than Proper Shipping Name), or entries that touch column separating lines on the form is not justification for frustrating hazardous cargo. Entries may be either in upper or lower case or combination.

A17.2.3.1. Use **Table A17.1** for detailed instructions on accomplishing the shipper's certification form for nonradioactive and radioactive shipments. Use **Table A17.2** to determine if a Shipper's Declaration for Dangerous Goods is required for radioactive shipments.

A17.2.3.1.1. For forms with the "Nature and Quantity of Dangerous Goods" in columnar format, enter information in the appropriate column according to **Table A17.1**.

A17.2.3.1.2. For forms with the "Nature and Quantity of Dangerous Goods" open for continuous printing, enter the basic description according to **Table A17.1**. Example: "UN2744, Cyclobutyl chloroformate, 6.1 (8,3), PG II."

A17.2.3.1.3. For forms with the "Nature and Quantity of Dangerous Goods" open for continuous printing, use two oblique strokes, i.e. "//", to separate sequences of

information or place each sequence on a separate line. Separate information within a sequence with a comma. See **Figure A17.1** to identify separation of each sequence.

A17.2.3.2. Hazardous materials with different proper shipping names/UN numbers will not be shipped under the same transportation control number (TCN). Complete a Shipper's Declaration for Dangerous Goods according to this attachment to identify each proper shipping name/UN number identified by the TCN (see A17.4.2. and A17.3. for exceptions). A single Shipper's Declaration for Dangerous Goods will be used for multiple like items shipped under one TCN.

A17.2.3.3. The certifying official may make pen and ink changes to any key. Someone other than the certifying official may make pen and ink changes to Keys 1 (only to the telephone number and not to the address), 2, 3, 5, 8, 9, and 19 without affecting the certification. Personnel making a change to any key must sign next to or above the change. Additional relevant information may be added to Key 19 by someone other than the certifying official, provided all copies reflect the additional information and they are signed. All entries must be durable, clear, and legible on all copies. Shipments may be frustrated if any entry on the form is not clear and legible. If the Shipper's Declaration for Dangerous Goods form is rejected, the correction must be accomplished as described in this paragraph or an entirely new form must be completed and presented to the shipping activity.

A17.2.3.4. Leave blank any key that does not require an entry (i.e., Key 14 when there is no subsidiary risk).

A17.2.3.5. If the Shipper's Declaration for Dangerous Goods does not contain sufficient space in any one key to accommodate all of the required information, use an additional Shipper's Declaration as an extension page. Each page must show the page number and total number of pages (Key 4). All pages must have the vertical red hatch border.

A17.2.4. Not Enough Copies or No Copies. In instances where there are not enough copies of the Shipper's Declaration for Dangerous Goods, a certified "true copy" may be placed with the station file manifest. When making a true copy:

A17.2.4.1. Annotate all the information verbatim from the original Shipper's Declaration for Dangerous Goods.

A17.2.4.2. Use the information in the signature block from the original form and annotate it on the true copy, (i.e., John Doe, 2 Oct 11). On the reverse side of the form, type or clearly print the words "True Copy" and the name of the individual who is certifying the form to be a true copy. This official must sign the form in longhand above the typed or printed name. The individual preparing a "true copy" need not be qualified according to A25.3. to certify the Shipper's Declaration for Dangerous Goods as a true copy.

A17.2.5. Split Shipments. When a shipment is split according to procedures identified in DTR 4500.9-R.

A17.2.5.1. Someone other than the certifying official may change key 5 and key 16 entry for number of packages only. The individual making the change must sign above it.

A17.2.5.2. All other entries in key 16 (i.e., type of packaging and net quantity) will only be changed by the certifying official.

A17.2.5.3. Prepare a "true copy" according to A17.2.4. The original shipper's certification form will accompany the aircraft manifest with the first shipment. Attach a split shipment "true copy" to aircraft manifest and station manifest for subsequent shipments. Each Shipper's Declaration must reflect the correct TCN and number of packages.

A17.2.5.4. Enter statement, "Shipment split at XXX (use Air terminal three letter code) IAW DTR 4500.9-R, Part II" on reverse side of all Shipper's Declaration forms.

A17.2.6. Multiple Mode Shipments. Shipments certified to the ICAO, IATA, or 49 CFR that do not exceed the passenger quantity limitations of the certifying document may use the same Shipper's Declaration for Dangerous Goods for both the commercial and military segments of air transport. Include any information required by A17.1.2. For shipments that exceed the passenger quantity limitations of the ICAO, IATA, or 49 CFR:

A17.2.6.1. Complete a Shipper's Declaration for Dangerous Goods according to the ICAO, IATA, or 49 CFR for the commercial segment and a separate Shipper's Declaration for Dangerous Goods according to this manual for the military segment.

A17.2.6.2. Place copies of the Shipper's Declaration for Dangerous Goods needed for subsequent movement in a waterproof envelope on the number one piece of the shipment.

A17.2.6.3. DOD aerial port personnel will remove the copies of the Shipper's Declaration for Dangerous Goods from the waterproof envelope and obliterate the "cargo aircraft only" label if not required for military transport.

A17.2.7. Classified Information. Follow DTR 4500.9-R, Part II, Chapter 205 and MIL-STD-129 for marking and documenting classified hazardous materials. If the information to be entered on the Shipper's Declaration is classified, the following procedures apply:

A17.2.7.1. Complete the signed original in detail, including essential classified data, and attach to the manifest that is placed on the aircraft. Once the classified information is applied, the Shipper's Declaration for Dangerous Goods must carry the same classification as the highest classification of the entered information.

A17.2.7.2. The manifest on the aircraft must carry the same classification as the classified information until the classified Shipper's Declaration for Dangerous Goods is detached and handled according to applicable security regulations.

A17.2.7.3. Complete the station file copy in detail except for the classified information. Enter the following statement in "Additional Handling Information" (Key 19): "See aircraft commander's copy of Shipper's Declaration for Dangerous Goods for complete information."

A17.2.8. Secondary Load. Complete a Shipper's Declaration of Dangerous Goods according to this attachment for each secondary load.

A17.2.9. Emergency Telephone Number. DOD activities will enter the applicable telephone number(s) in Key 19. Enter the phone number only one time if the number applies to each hazardous material on the manifest. Include the area code or international access code.

A17.2.9.1. For Class 1 material, contact The Army Operations Center, (703) 697-0218/0219 (COLLECT), or DSN 227-0218/0219. Ask for the Watch Officer.

A17.2.9.2. For radioactive material, contact:

A17.2.9.2.1. Army: (703) 697-0218 (COLLECT)

A17.2.9.2.2. Air Force: (202) 767-4011 (COLLECT)

A17.2.9.2.3. Navy / Marines: (757) 887-4692 (COLLECT), or 1-888-528-0148

A17.2.9.2.4. DLA: (717) 770-5283 (COLLECT)

A17.2.9.3. For all other hazardous materials, enter the domestic and international contact numbers for the DOD Emergency Response Hotline:

A17.2.9.3.1. Domestic: 1-800-851-8061 (toll free)

A17.2.9.3.2. International: 1-804-279- 3131(collect)

A17.2.9.4. Shipments originating from non-DOD activities use a company, safety organization, or other contact telephone number applicable to the material shipped. In which case, comply with 49 CFR §172.604.

A17.3. Exceptions for Operations Conducted According to DTR 4500.9-R, Part III, *Mobility*. Prepare the Shipper's Declaration for Dangerous Goods according to this manual for mobility operations. The following exceptions may be used for tactical, contingency, and emergency operations (to include exercises) and other deployment operations conducted according to DTR 4500.9-R, Part III.

A17.3.1. Complete and sign at least two copies of the Shipper's Declaration for Dangerous Goods Form. Attach one form to the copy of the manifest that is placed on the aircraft and one copy to the originating station file manifest.

A17.3.2. A single Shipper's Declaration for Dangerous Goods may be used to identify and certify more than one type of hazardous material (except radioactive material) when shipped under a single mobility TCN (DTR 4500.9-R, Part III, Appendix H) or when **Chapter 3** of this manual is authorized.

A17.3.3. Certification is not required for hand-carried hazardous materials authorized according to **paragraph 3.5**.

A17.3.4. The following exceptions may be made when completing the Shipper's Declaration for Dangerous Goods according to **Table A17.1**.

A17.3.4.1. Key 2 and Key 9. Enter the consignee address and the three digit airport code or airport name of the POD. If classified, enter "worldwide mobility".

A17.3.4.2. Key 5. Enter the transportation control number (TCN), developed according to DTR 4500.9-R, Part III – Appendix H

A17.3.4.3. Key 7. Although the label is not required on the cargo, Key 7 must have the "Passenger and Cargo Aircraft" block deleted if the material is cargo aircraft only. If different hazardous materials are entered on the Shipper's Declaration according to A17.3.4.4 use the most restrictive "P" Code to complete Key.

A17.3.4.4. Keys 11-18. Different hazardous materials may be entered when prepared as a single shipment unit.

A17.3.4.5. Key 19. Complete Key 19 according to this attachment and **Table A17.1** for individual items.

A17.3.5. Diverting Hazardous Materials to Nontactical Airlift. Hazardous materials certified for mobility operations may be diverted to nontactical airlift without completion of a new Shipper's Declaration for Dangerous Goods provided the following conditions are met:

A17.3.5.1. All hazardous materials packaged according to manual which are part of a single shipment are compatible according to **Table A18.1** and **Table A18.2**.

A17.3.5.2. Hazardous materials which are part of the single shipment unit are compatible with all other hazardous materials according to **Table A18.1** and **Table A18.2**.

A17.3.5.3. Vehicle and equipment fuel levels do not exceed limits authorized for nontactical airlift.

A17.3.5.4. Use provisions of **A17.2.4** when extra copies of the Shipper's Declaration for Dangerous Goods are needed.

A17.4. General Certification Requirements.

A17.4.1. Empty Packaging. Packagings considered empty according to **paragraph A3.1.16** do not require a Shipper's Declaration for Dangerous Goods form. Follow procedures specified in **paragraph A3.1.16.4**. ***Note:*** When purging equipment/facilities are not present at a given location, items must be properly packaged and certified as hazardous materials.

A17.4.2. Kits.

A17.4.2.1. When more than one PSN is authorized to be packaged in a single container(s) as a "kit" (see **Attachment 1**, definition of "Kit"), complete information in Keys 11-18 for each PSN. This does not apply to an item classified and described in **Table A4.1** as a "KIT" (e.g. FIRST AID KITS, CHEMICAL KITS, POLYESTER RESIN KITS, etc).

A17.4.2.2. See Key 19 instructions for additional requirements.

A17.4.3. Excepted Quantities. A Shipper's Declaration for Dangerous Goods is not required for excepted quantities prepared according to **A19.2**. Annotate the shipping papers "Dangerous Goods in Excepted Quantities" and mark the package as required by **A19.2.3**. Passenger restrictions do not apply to items in excepted quantities.

A17.5. Certification Requirements Applicable to Class.

A17.5.1. Class 1.

A17.5.1.1. Identify fired exercise torpedoes or rockets, no longer containing explosive components, with OTTO Fuel II residue remaining as "Environmentally Hazardous Substance Liquid, N.O.S. (OTTO Fuel II)" and prepare according to **A13.2.2.15**.

A17.5.1.2. When shipping unpackaged explosives as specified in **paragraph A5.2**.

A17.5.1.2.1. Complete Keys 11 through 15 according to **Table A17.1** for each different PSN/UN Number.

A17.5.1.2.2. Complete Key 16 and 17, according to the **Table A17.1** for unpackaged explosives.

A17.5.1.3. When secured in authorized packaging and loaded on a tactical vehicle as an operational component according to specified procedures in a technical manual or publication, cite appropriate packaging reference from **Attachment 5**.

A17.5.1.4. Use the DOD Joint Hazard Classification System (JHCS) to complete certification information unless a final/interim hazard classification or a DOT approved classification is used according to A3.3.1.4.

A17.5.1.5. If a warehouse pallet includes like items (same PSN and Identification Number) in both UN Specification and Grandfathered packaging, complete Keys 16 and 17 as specified in this manual for individual packages or containers.

A17.5.2. Class 2.

A17.5.2.1. Fire Extinguishers. Fire extinguishers removed from an authorized holder of a vehicle or equipment being airdropped does not require separate certification. Identify as a secondary hazard of the vehicle or equipment. Package the fire extinguisher in a strong outer container. This only applies to the fire extinguisher that is assigned as an installed component of the vehicle or equipment. Package and certify spare/stowed cylinders according to this manual.

A17.5.3. Class 3.

A17.5.3.1. Spare fuel in UN Specification jerricans (see A3.3.3.3) when transported in approved, permanently configured and mounted holders may be certified as part of a vehicle or SE (see A17.5.8.1.1.10.).

A17.5.6. Class 6.

A17.5.6.1. A Shipper's Declaration for Dangerous Goods is not required for Biological Substances, Category B, UN3373 provided:

A17.5.6.1.1. The package is marked "Biological Substance, Category B."

A17.5.6.1.2. " UN3373" is contained within a square-on-diamond label displayed on the outer packaging of on a background of contrasting color.

A17.5.6.1.3. Hazardous materials (in Packing Group II or III) used to stabilize or prevent degradation of the sample does not exceed 30 mL (1 ounce) or 30 g (1 ounce) in each inner packaging.

A17.5.6.1.4. The completed package meets requirements of A10.9.

A17.5.7. Class 7.

A17.5.7.1. Packages marked “Radioactive Material, Excepted Package” according to A14.4.6.2 do not require a Shipper's Declaration For Dangerous Goods.

A17.5.8. Class 9.

A17.5.8.1. Vehicles, Engines Internal Combustion, Fuel Devices, and Other Equipment.

A17.5.8.1.1. For items prepared according to A13.4., A13.5., or A13.6., identify the primary hazard Class 9 description in keys 11-14. See **Table A17.1**, Key 19 instructions for description of secondary hazards.

A17.5.8.1.1.1. Engines and generators mounted, secured or carried as an accompanying load on a vehicle, SE or trailer for convenience of movement or handling are considered secondary loads, and require a separate certification.

A17.5.8.1.1.2. A separate certification is not required for spare fuel in UN specification jerricans secured in permanently configured and approved holders of the transporting vehicle or equipment. DOT 5L jerricans secured in permanently configured and approved holders may be documented in the same manner provided they are drained to the greatest extent possible. See **Table A17.1**, Key 19 instructions for description of secondary hazards.

A17.5.8.1.2. Drained and purged repairable engines and fuel devices prepared according to **A13.5.2.5** and **A13.5.2.7** are not hazardous for transportation. Follow procedures specified in **paragraph A3.1.16.4**.

A17.5.8.1.3. Certification is not required for movement of wheelchairs with patients.

A17.5.8.1.4. Dual-powered vehicles (designed to operate on both flammable liquid and gas) must meet the requirements of **A13.4** for each fuel tank. Describe as "Vehicle, Flammable Liquid Powered".

A17.5.8.1.5. Describe vehicles fueled with a combustible liquid (flashpoint greater than 60 degrees C) as "Vehicle, Flammable Liquid Powered".

A17.5.8.1.6. If a vehicle, equipment, machinery, or apparatus contains magnetized material with a magnetic field strength greater than 0.002 gauss or more, measured at 2.1m (7 feet) from the source describe the magnetized material secondary hazard as required by Key 19 instructions. Magnetic material that has a field strength greater than 0.00525 gauss at 4.6m (15 feet) from the source is forbidden for air movement.

A17.5.8.1.7. When wings and/or external fuel tanks are removed from an aircraft or helicopter to facilitate loading on the transport aircraft, consider all pieces as a single unit for identification on the Shipper’s Declaration for Dangerous Goods form.

A17.5.8.2. Dry Ice. When dry ice is used as a refrigerant for another hazardous material, identify the dry ice as a secondary hazard on Shipper's Declaration form as required by Key 19 instructions. When used in this manner, the dry ice shipping description is not required to be entered in the Nature and Quantity of Dangerous Goods (Keys 11-18) of the Shipper's Declaration for Dangerous Goods. Ensure packaging meets the requirements of A13.10.

Table A17.1. Step-by step Instructions for Completing Shipper's Declaration for Dangerous Goods Form.

Key 1. Shipper. Enter the address and telephone number where the hazardous material was certified.
Key 2. Consignee. Enter the six-digit Department of Defense Activity Address Code (DODAAC) and/or the in-the-clear geographical location of the ultimate consignee, or

“Worldwide Mobility” according to A17.3. For infectious substances, enter also the name and telephone number of a responsible person for contact in an emergency.
Key 3. Air Waybill No. The aircraft manifest number to which the Shipper's Declaration for Dangerous Goods will be attached may be entered in this key. This number need not be entered by the shipper. It may be entered by the accepting operator at the time it is assigned. This key may also be left blank.
Key 4. Page...of...Pages. Enter the page number and total number of pages of the Shipper's Declaration for Dangerous Goods form. Enter "Page 1 of 1 Pages" or leave blank if there are no extension pages.
Key 5. Shipper's Reference Number. Enter the 17-character transportation control number (TCN).
Key 6. Optional Block. Inspection activity will annotate date of inspection and acceptance for air movement according to A28.1.2. Shipper unit cargo identification information may also be entered.
Key 7. Shipment Within Passenger Aircraft and Cargo Aircraft Limitations. Use the following to determine limitations: 7.1. If the shipment is acceptable for movement on both passenger and cargo aircraft (“P5” in Table A4.1., Column 7), delete "Cargo Aircraft Only." 7.2. If the shipment is allowed only by cargo aircraft (“P1” “P4” in Table A4.1., Column 7), delete "Passengers and Cargo Aircraft." 7.3. If the shipment is certified to a special approval document which identifies the mode of transportation as Cargo Aircraft Only, delete “Passengers and Cargo Aircraft.” This applies even if the PSN is identified as a “P5” in Table A4.1., Column 7. 7.4. If the shipment is certified to a Special Approval document which identifies the mode of transportation as acceptable by either Passenger Aircraft or Cargo Aircraft Only, use the “P” code from Table A4.1., Column 7 to determine passenger limitations.
Key 8. Airport of Departure. Enter the three-digit Port of Embarkation (POE) and/or the in-the-clear geographical location of the airport of departure.
Key 9. Airport of Destination. Enter the three-digit Port of Debarkation (POD) and/or the in-the-clear geographical location of the airport of destination. Enter "Worldwide Mobility", if applicable, according to A17.3.
Key 10. Shipment Type. 10.1. Delete "Radioactive" if the shipment contains no radioactive material. 10.2. Delete “Nonradioactive” if the shipment contains radioactive material.
Key 11. UN, NA, OR ID No. Enter the UN, North American (NA), or identification number (ID) given in column 2 of Table A4.1. Include the UN, NA, or ID prefix and the number. Enter the following information, if applicable, in association with the basic description: 11.1. The letters “RQ” for a hazardous substance. Enter the letters “RQ” before the basic description (see A4.4.).
Key 12. Proper Shipping Name. Enter the PSN shown in Table A4.1. Enter the following

information, if applicable, in association with the PSN: 12.1. Technical name, in parentheses, when required by Attachment 4. 12.2. For materials which are toxic (poisonous) by inhalation, without regard to hazard classification, enter the words "TOXIC-INHALATION HAZARD" and "ZONE A", "ZONE B", "ZONE C", or "ZONE D" for gases, or "ZONE A" or "ZONE B" for liquids, as appropriate. The word "TOXIC" need not be repeated if it is already identified in the PSN (i.e. enter "INHALATION HAZARD" and the appropriate zone). 12.3. The word "Waste" preceding the PSN for a hazardous material that is a hazardous waste. 12.4 Enter the words “EMPTY UNCLEANED” or “ RESIDUE LAST CONTAINED” before or after the proper shipping name for empty packagings containing residue of dangerous goods.
Key 13. Class and Division. Enter the hazard class and division number given in column 4 of Table A4.1. 13.1. For Class 1 material, enter classification and/or the Subdivision if applicable assigned in the DOD Joint Hazard Classification System (JHCS) or classification approval document (e.g., IHC) to include the Inhabited Building Distance (IBD) expressed in feet, (e.g., 1.1, 1.2.1,(08) 1.2.3, or (02)1.3. The words “Subdivision” and “IBD” are optional. 13.2. For Class 1 material, include the compatibility group letter in association with Class/Division (e.g., “1.1E”, “1.2.2D”). A compatibility group letter for non-Class 1 material, when assigned in JHCS as part of the proper shipping description will be annotated in association with Class/Division (e.g., “4.2G”, “8S”, “3L”). 13.3. For a single item with more than one hazard, enter the hazard class number of the item's primary hazard. 13.4. Consumer Commodity. The hazard classification "ORM-D" may be used for domestic shipments only.
Key 14. Subsidiary Risk. Enter the subsidiary risk if given in column 6 of Table A4.1. in parenthesis following primary hazard classification (e.g., 8 (3,6.1). Subsidiary risks may be identified by sources other than Table A4.1 (e.g. MSDS). If the subsidiary risk was obtained by a source other than Table A4.1, annotate the source in key 19. For example: “Subsidiary Risk Assigned Per MSDS.” Class 1 items identified in the JHCS or by Service approved interim hazard classification as also requiring a Radioactive Material label will have the radioactive material subsidiary risk identified (e.g., 1.2.2E (7)).
Key 15. Packing Group. Enter the applicable Packing Group (PG) given in column 5 of Table A4.1.
Key 16. Quantity and Type of Packing. 16.1. Nonradioactive shipments enter: 16.1.1. The number of packages (of same type and content) and their type of packaging. 16.1.2. Type of packaging listed in this key is the authorized packaging identified in the packaging paragraph. Identify the type of packaging by text description of the outer packaging. UN Specification code is optional. For example: 1 fiberboard box x 3 kg (6.6 pounds); 1 fiberboard box (4G) x 3 kg (6.6 pounds), etc. 16.1.3. For specifically named self-propelled vehicle and mechanical apparatus enter nomenclature or basic description of the item (i.e., truck, generator, etc.). Entering a specific M-Series or commercial model number or a specific description (e.g., 50 KW, 60 HZ for

generator), in addition to the basic description, is optional. The basic description may be used for items not requiring an outer package or container (e.g., cylinders) according to this manual.
16.1.4. The weight, volume, or other applicable measure of the actual hazardous material (per package).
16.1.4.1. Do not include any nonhazardous content of the shipment.
16.1.4.2. Enter the net quantity in metric measurement units. The equivalent English unit of measure may be entered in parenthesis immediately following the metric unit.
16.1.4.3. Show the quantity per package immediately following the number and type of package (e.g., 2 wooden boxes x 4.5 kg (10 pounds); 1 fiberboard box (4G) x 5 L (1.3 gallons); 2 cylinders X 15 kg).
16.1.4.4. Batteries (UN2794, UN2795, UN2800, UN3028, UN3090, UN3292, and UN3480) enter the gross weight (G) of the batteries per outer container (e.g., 1 fiberboard box (4G) x 25 kg G)
16.1.4.5. For explosives enter the Transportation "Net Explosive Weight (NEW)" in metric weight per package or per warehouse pallet or skid (i.e., 3 wooden boxes x 120 kg (264.6 pounds) NEW; or 1 warehouse pallet x 200 kg (441 pounds) NEW). Entry of pounds in association with metric weight is preferred but not required. It is acceptable to round up (to the right of the decimal point) the net explosives weight (NEW) listed in the Joint Hazard Classification System (JHCS) or other classification document required by A3.3.1.4 when completing Key 16. Example: 0.06432 kg NEW may be shown as “0.07 kg NEW” in Key 16. If, the “Net Explosive QD Weight (NEWQD)”, used for aircraft parking and intransit storage, is different than the transportation NEW, enter the NEWQD in Key 19.
16.1.4.6. When shipping unpackaged explosives as specified in paragraph A5.2., enter the total net explosives weight per PSN/UN Number (e.g., "On Airdrop Platform X 50 Kg N.E.W", "In Ready Racks X 15 Kg N.E.W", and "In ISU X 30 Kg N.E.W.").
16.1.4.7. For items classified as a non-explosive that contain explosive components (e.g., 3L, 3J, 8S, etc.) use the quantity of the assigned predominate hazard.
16.1.4.8. Express in kilograms (pounds), not pounds per square inch, the quantity of compressed gas unless otherwise specified in this instruction. When certifying to A6.2. “Aerosols,” A6.3. “Small Receptacles Containing Compressed Gases,” A6.7. “Fire Extinguishers,” A6.10. “Cigarette Lighter or Other Similar Devices Charged with Fuel,” and A13.3. “Consumer Commodity” (Aerosols) other units of measure; (i.e., fluid ounces, gallons, or ounces) are specified and may be shown on this form. See also A26.5.
16.1.5. Limited Quantity enter either:
16.1.5.1. The type of package and net weight of the hazardous material, or,
16.1.5.2. Where the letter “G” follows the quantity in Table A19.2., Per Package column, enter the the type of package and the gross weight of the package. The letter “G” must be added after the unit of measurement. (e.g., 1 wooden box x 28 kg G)
16.1.6 When an overpack is used for handling purposes and prevents identification of contents and/or UN specification markings, enter the words “Overpack Used”. Identify the number of overpacks if more than one is used. “Overpack Used" may alternatively be entered following the Packaging Instruction (Key 17), or applicable authorizations (Key 18) when the open continuous printing form is used. Entering the total quantity per each overpack is optional.
16.1.7. For magnetized material, enter the number and type of packaging. No entry for net

quantity is required. Weight or size of container is optional. 16.1.8. When an item is described in Table A4.1. as a "KIT", enter the aggregate quantity of hazardous materials in Key 16. 16.1.9. Multiple-Element Gas Containers: 16.1.9.1. Enter the total quantity of all cylinders for each Multiple-Element Gas Container (e.g., 1 Multiple-Element Gas Container X 40 kg) 16.1.9.2. When shipping Multiple-Element Gas Containers, use appropriate packaging paragraph from Attachment 6 to identify DOT or UN cylinder 16.1.9.3. Cylinders which are not manifolded to form a single unit will be certified as individual cylinders (e.g., 4 DOT 3AA Cylinders X 10 kg). 16.1.10. For life-saving appliances, Class 9, prepared according to A13.12., show a specific description and the number of the items packaged for shipment. For example; "1 wooden box x 3 self-inflating life vests". 16.2. Radioactive shipments enter: 16.2.1. Name or symbol of the radionuclide in the material. 16.2.2. Description of the physical and chemical form of the material, if it is not in special form (generic chemical description is acceptable for chemical form). If special form, enter "Special Form." 16.2.3. The number of packages (of same type and content), the type of package, and the activity contained in each package in terms of Becquerel or Terabecquerel. The equivalent customary unit of measure (i.e., Ci, mCi, or uCi) may be included in parenthesis.
Key 17. Packaging Instructions. 17.1. Nonradioactive shipments enter: 17.1.1. The packaging paragraph from the applicable packaging reference authorized in A17.1.2. used to prepare the material for shipment. 17.1.1.1. AFMAN 24-204_IP, use packaging paragraph in Table A4.1, Column 8 (e.g., “A9.8.”, “A13.5.”, etc) or Attachment 27 (e.g., “A27.2.”, “A27.9.”, etc.). Use of sub-paragraphs from this manual (e.g., "A5.23.1) are not required when completing this key but, if used, the sub-paragraph used must properly identify the package, container, or shipment configuration. 17.1.1.2. IATA, Dangerous Goods Regulations, use packing instruction from Section 4, “List of Dangerous Goods” (e.g., “806”, “134”, etc.) 17.1.1.3. ICAO, Technical Instructions, use packing instructions from Table 3-1, “Dangerous Goods List” (e.g., “309”, “619”, etc.) 17.1.1.4. 49 CFR, use packaging reference from Part 173 specified in the Hazardous Materials Table (§172.101, Column 8b), (e.g. §173.62, §173.202, etc) 17.1.2. If the packaging has been approved by a DOT Special Permit, CAA, COE, or waiver cite the approval number (i.e., AFMC 24-204-96-09; COE NA-84-505; DOT-SP 3849; etc.) See A17.5.1. when the packaging requirement is included as part of the explosives hazard classification approval document. 17.1.3. If a UN packaging specification certified package is overpacked to meet air eligibility requirements, cite A3.1.7.3. and the applicable packaging paragraph for the material. 17.1.4 Consumer Commodities enter "A13.3." when an item is classified as a “Consumer Commodity” regardless of the original hazard classification of the substance within an individual inner packaging or receptacles.

17.1.5 Limited Quantities enter “A19.3” when an item, regardless of original classification, is packaged as a limited quantity. If an item, in a limited quantity, is packaged under a Special Permit, CAA, COE, or waiver enter the special authorization approval in place of “A19.3.”
17.1.6. For captured ammunition and ammunition with unknown characteristics shipped according to A3.3.1.7., include in key 17 the reference to A3.3.1.7. and the applicable packaging paragraph from Table A4.1. (for example, "A3.3.1.7./A5.20."). Include a copy of the EOD safety certification. Comply with A17.2.7. for classified information.
17.1.7. When shipping unpackaged explosives as specified in paragraph A5.2., enter "A5.2.”
17.1.8. When packaging requirements are included as part of a classification of explosives approval, enter A5.3. A copy of the classification approval must accompany the shipment.
17.1.9 When Class 1 materials are secured in authorized packaging and loaded on a tactical vehicle as an operational component according to specified procedures in a technical manual or publication, cite appropriate packaging reference from Attachment 5.
17.2. Radioactive shipments enter (see Figure A17.2., steps 5 and 6 for assistance):
17.2.1. Packaging paragraph from Table A4.1 used to prepare the material for shipment.
17.2.2. Category of the package (i.e., “I-White,” “II-Yellow,” or “III-Yellow”).
17.2.3. The transport index, preceded by the prefix "Ti", assigned each package having a "Radioactive Yellow-II" or "Radioactive Yellow-III" label and dimensions of each package, including dimensional units (for drums, the capacity is acceptable (i.e. 55 gallons)).
17.2.4. The fissile class. If the package is exempt enter the words "Fissile Exempt."

Key 18. Authorization.
18.1. Nonradioactive shipments enter:
18.1.1. When applicable, enter the words "Limited Quantity" or "LTD. QTY."
18.2. Radioactive shipments enter Approval Identification Markings (if relevant). List the package identification markings of any of the documents listed below issued by a competent authority. Include the words "attached" to indicate that the documents are attached to the declaration form.
18.2.1. Special form approval certificate.
18.2.2. Type B package design approval certificate.
18.2.3. Type B(M) package shipment approval certificate.
18.2.4. Fissile material package design approval certificate.
18.2.5. Fissile material package shipment approval certificate.
18.2.6. Special arrangement approval certificate.
18.2.7. Any similar documents.

Key 19. Additional Handling Information. Enter:
19.1. General
19.1.1. The PSN and hazard class of each secondary hazard for items with multiple hazards. In addition, the quantity of each secondary hazard in metric units, U.S. standard units may follow the metric units in parenthesis, must be shown if specifically required by any of the following block 19 instructions (e.g., fuel, dry ice). Use of the words “Class” or “Class/Division” in describing hazard classification (e.g., “Class 3”) is optional.
19.1.2. Handling instructions, when specified by a packaging paragraph. Only enter if the handling instruction applies to the material being shipped.
19.1.3. For shipments packaged and transported under the authority of a CAA (Packaging or

Hazard Classification), annotate "PACKAGING AUTHORIZED BY COMPETENT AUTHORITY OF THE UNITED STATES OF AMERICA (USA)." If the CAA is from a country other than the USA, that country must be annotated in place of USA on the shipping papers. If the CAA does not have a number assigned to it, certify the shipment to A5.3. (see paragraph 2.5.2.). A copy of the CAA must accompany the shipment.

19.1.4. Enter the 24-hour Emergency Response number(s) for the hazardous material listed on the Shipper's Declaration for Dangerous Goods. See paragraph A17.2.9.3. for Emergency Response numbers used by DOD activities.

19.1.5. When use of hazard class label(s) are exempted by a DOT Special Permit (DOT-SP) for a domestic shipment, annotate "Hazard Class Label (or Labels) exempted by DOT-SP (enter permit number, e.g., DOT-SP XXXX).

19.2 Kits.

19.2.1. Identify that the item is a kit. This does not apply to an item classified and described in Table A4.1. as a "KIT" (e.g. FIRST AID KITS, CHEMICAL KITS, POLYESTER RESIN KITS, etc).

19.2.2. If shipping a kit consisting of more than one container, enter the statement: "contained in kit piece number ***" (replace "***" with the piece number which contains the hazardous material).

19.3. Class 1

19.3.1 If, the “Net Explosive QD Weight (NEWQD)”, used for aircraft parking and intransit storage, is different than the transportation NEW, enter the NEWQD (e.g., “NEWQD: 22.23kg”).

19.3.2. Identify any munition or ordnance item containing OTTO Fuel II as a propellant with the following entry: "Contains Otto Fuel II as a liquid propellant. In the event of a leak, avoid direct skin contact, ingestion, or inhalation of vapors. Vapors are toxic and may cause severe headache and nausea.”

19.3.3 When explosives are installed or embedded according to A3.3.1.9., use the article's overall description as the proper shipping name (e.g., Vehicle, Flammable Liquid Powered for an aircraft containing the engine). Identify all installed or embedded explosive components as secondary hazards by entering PSN, hazard class/division, and NEW.

19.3.4. For items containing liquid or hypergolic fuel that is corrosive and/or toxic include the following statement in Key 19: "Exercise extreme caution in handling this item. Keep well ventilated, away from sparks, fire hazards, and oxidizing materials. Vapors are toxic when inhaled. Liquid is corrosive.” One of the following statements must also be added:

19.3.4.1. "Leak detection indicator not required"

19.3.4.2. "Monitor leak indicator according to shipper provided instructions."

19.3.4.3. "Technical escort required."

19.3.5. For Grandfathered munitions certified according to Attachment 27, add the statement: “Government-owned goods packaged before January 1, 1990.”

19.4. Class 2

19.4.1. For Class 2 materials add the appropriate statement "Ship valve up in vertical position" or "Ship in horizontal position" to indicate compliance with A3.3.2.4.

19.4.2. For fire extinguishers secured in a holder according to A3.3.2.13. of non-regulated equipment, certify the fire extinguisher(s) according to the instructions in this table. Identify the equipment which the fire extinguisher is attached (i.e., trailer) in this Key.

19.4.3. Cryogenic Liquids. For cryogenic liquids prepared according to A6.11 enter venting

instructions. This is not required if venting procedures are provided in a separate instruction accompanying the shipment. Include the location and description of the vent valve. If the cylinder is empty and purged, venting is not required; comply with paragraph A3.1.16.4. For regulated cylinders, include one of the following statements for venting the unit:
19.4.3.1. "Vent container to outside of aircraft. Aircrew members must monitor vent valves during flight."
19.4.3.2. "Container is excepted from venting."
19.5. Class 4 and Class 5
19.5.1. Enter the control and emergency temperatures for temperature controlled Division 4.1 and 5.2 materials.
19.5.2. For Division 4.1 Self-Reactive Substances and Division 5.2 Organic Peroxides enter the following statement: "Protect from direct sunlight and all sources of heat and place in adequately ventilated area".
19.6. Class 7
19.6.1. For radioactive Category II-Yellow and Category III-Yellow, enter : “Radioactive material is intended for use in, or incident to, research, medical diagnosis, or treatment” when applicable (see special provision A507).
19.7. Class 9
19.7.1. Vehicles, Engines Internal Combustion, Fuel Devices, and Other Equipment. For items prepared according to A13.4., A13.5., or A13.6.:
19.7.1.1. Enter the PSN, hazard class, and net quantity of flammable fuel within tanks and/or system. For example; "Fuel, Aviation, Turbine Engine, Class 3, 38 L". When an item is completely drained (but not purged) , the shipper's estimate of the quantity of fuel remaining in the unit may be entered. Refer to A13.5 or A13.6 for authorized fuel levels.
19.7.1.2. Enter the PSN and hazard class for secondary hazards (batteries, mounted cylinders and fire extinguishers, installed engine starting fluid, etc). Show number of secondary hazards. For example; "1 each Batteries, Wet, Filled with Acid, 8" or "2 ea. Fire Extinguishers, 2.2".
19.7.1.3. Identify any integral installed fire suppression systems as a secondary hazard.
19.7.1.4. Identify mounted engines and generators that are by design an approved part of an M-Series vehicle as a secondary hazard (also identify hazardous components such as batteries).
19.7.1.5. Enter the name and quantity of any non-hazardous fuel in vehicles or equipment tanks.
19.7.1.6. When an item is drained and purged of any flammable liquid, but is being certified due to another hazard, enter "Drained and Purged."
19.7.1.7. Include the statement "non-hazardous battery installed" if applicable.
19.7.1.8. Reference to the technical directive used to prepare the item for military air shipment is not required, except for fuel servicing equipment and vehicles drained in accordance with technical directives (technical orders, field manuals, etc.). In this case, indicate the directive used: "Drained IAW T.O. XX-XX-XX"
19.7.1.9. For UN specification jerricans secured in permanently configured and approved holders of the transporting vehicle or equipment. Identify PSN, hazard class, the number of jerricans and quantity of fuel in each jerrican for the transporting vehicle or equipment. Example - "4 Jerricans X 19 L"; "1 Jerrican X 19 L”; “1 Jerrican X 12 L." DOT 5L jerricans secured in permanently configured and approved holders may be documented in the same

manner provided they are drained to the greatest extent possible. 19.7.1.10. For vehicles, equipment, machinery, or apparatus containing magnetized material with a magnetic field strength greater than 0.002 gauss or more, measured at 2.1m (7 feet) from the source, enter "Contains Magnetized Material." 19.7.2. For Dangerous Goods in Machinery or Apparatus, enter the PSN, hazard class, and net quantity of hazardous materials in a solid, liquid, or gaseous state contained within the article. 19.7.3. For life-saving appliances, Class 9, prepared according to A13.12., enter the PSN and hazard class of each hazardous component within the shipping container. 19.7.4. When dry ice is used as a refrigerant for another hazardous material, identify the dry ice as a secondary hazard by entering the PSN, hazard class, and net quantity.
Key 20. Name/Job Title of Signatory. Enter the name and job title of the official signing the form. Military rank is not considered a job title, but may be included.
Key 21. Place and Date. Enter the place and date the material was certified (i.e., Hill AFB, 1 Jan 97).
Key 22. Signature. The official who certifies that the shipment complies with the requirements of this instruction must sign the form. Signature may be either written manually, by mechanical entry, or by a digital method. In all cases, the individual who signs the certification statement must personally inspect the HAZMAT item being certified.

Table A17.2. Determining Certification Requirements for Class 7.

Step 1. Determine the radionuclide and type of package. Turn to A11.3. Find the radionuclide, its name, and the maximum radioactive quantity (TBq or Ci) that can be shipped in a type A package. If a type B container is required, go to Step 3.
Step 2. Determine if a Shipper's Declaration for Dangerous Goods is Required. Turn to Table A11.2. Determine the maximum quantity that can be shipped as a limited quantity. This amount will be a fraction of the quantity listed in Table A11.1. If the item shipped qualifies as an excepted package, a Shipper's Declaration for Dangerous Goods is not required, but you must comply with A11.10. and A11.11. Go to Step 3 if the material is not a limited quantity.
Step 3. Enter the Information Required in Key 16. Make a note of the transport index, but do not enter it in Key 16.
Step 4. Determine the Proper Shipping Name (PSN). Select the applicable PSN from Table A4.1. Complete the appropriate keys using the information found in Table A4.1., columns 2 through 4. Do not complete Key 17 at this point. Make a note of all the basic paragraphs listed in column 8.
Step 5. Select the Packaging Paragraph. Determine the correct packaging paragraph from the list you made in Step 4 based on the type of package used. Determine the paragraph based on the particular container used. Enter this information as the first entry in Key 17.
Step 6. Determine the Label Requirements. Use the transport index, the surface reading, and fissile class, if appropriate, to determine the labels required by Attachment 15. Enter the label required as the category of package entry in Key 17, immediately following the packaging paragraph. Enter the transport index and any remaining information required to complete Key 17.

Step 7. Complete the Remaining Keys of the Shipper's Declaration for Dangerous Goods. Step-by-step instructions for completing the Shipper's Declaration for Radioactive Material are identified in Table A17.1.

Figure A17.1. Completed Samples of the Shipper's Declaration for Dangerous Goods.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

Shipper Key 1	Air Waybill No. Key 3 Page of Pages Key 4 Shipper's Reference Number (optional) Key 5
Consignee Key 2	(Company logo, name and address optional) Key 6
Two completed and signed copies of this Declaration must be handed to the operator	**WARNING** Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.
TRANSPORT DETAILS This shipment is within the limitations prescribed for: (*delete non-applicable*) Key 7 PASSENGER AND CARGO AIRCRAFT / CARGO AIRCRAFT ONLY Airport of Departure: Key 8 Airport of Destination: Key 9	Shipment type: (*delete non-applicable*) NON-RADIOACTIVE / RADIOACTIVE Key 10

NATURE AND QUANTITY OF DANGEROUS GOODS
UN Number or Identification Number, proper shipping name, Class or Division (subsidiary risk), packing group (if required), and all other required information.

Keys 11,12,13,14,15 //16 //17 //18

Additional Handling Information

Key 19

24 hr. Emergency Contact Tel. No. _____

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met.	Name/Title of Signatory Key 20 Place and Date Key 21 Signature (see warning above) Key 22

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

SHIPPER: Key 1

PHONE NUMBER: DSN:

AIR WAYBILL NO. Key 3

PAGE OF PAGES Key 4

SHIPPER'S REFERENCE NUMBER TCN: Key 5

CONSIGNEE: Key 2

Key 6

COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR

WARNING

Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties

TRANSPORTATION DETAILS

THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR: (DELETE NON-APPLICABLE) Key 7

PASSENGER AND CARGO AIRCRAFT | CARGO AIRCRAFT ONLY

AIRPORT OF DEPARTURE: Key 8

AIRPORT OF DESTINATION: Key 9

SHIPMENT TYPE: (DELETE NON-APPLICABLE)

NON-RADIOACTIVE | RADIOACTIVE Key 10

NATURE AND QUANTITY OF DANGEROUS GOODS

DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE of PACKING	PACKING INSTRUCTION	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
Key 11	Key 12	Key 13/14	Key 15	Key 16	Key 17	Key 18

ADDITIONAL HANDLING INFORMATION

Key 19

EMERGENCY TELEPHONE NUMBER:

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.

NAME/TITLE OF SIGNATORY Key 20

PLACE AND DATE Key 21

SIGNATURE (See warning above) Key 22

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

SHIPPER
TRAFFIC MANAGEMENT FLIGHT
5236 CHASE ST
WRIGHT-PATTERSON AFB, OH 45433-5501

PHONE NUMBER:
(937) 257-4409 DSN: 787-4409

AIR WAYBILL NO.

PAGE 1 OF 1 PAGES

SHIPPER'S REFERENCE NUMBER
TCN: FB230080609003XXX

CONSIGNEE
TRAFFIC MANAGEMENT FLIGHT
436 ABW/LRS
RAMSTEIN AB, GERMANY

COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR

WARNING

Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties

TRANSPORTATION DETAILS

THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR: (DELETE NON-APPLICABLE)

PASSENGER AND CARGO AIRCRAFT

~~CARGO AIRCRAFT ONLY~~

AIRPORT OF DEPARTURE:
DOV
DOVER AFB, DE

AIRPORT OF DESTINATION:
RAMSTEIN AB, GERMANY

SHIPMENT TYPE: (DELETE NON-APPLICABLE)

NON-RADIOACTIVE

~~RADIOACTIVE~~

NATURE AND QUANTITY OF DANGEROUS GOODS

DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE of PACKING	PACKING INSTRUCTION	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
RQ UN1573	CALCIUM ARSENATE	6.1	II	1 METAL DRUM X 0 .6 KGS	A10.5	

ADDITIONAL HANDLING INFORMATION

EMERGENCY TELEPHONE NUMBER: 1-800-851-8061 1-804-279-3131

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.

NAME/TITLE OF SIGNATORY
Austin Stewart
Warehouse Foreman

PLACE AND DATE
WPAFB, OH. 45433 29 Feb 2008

SIGNATURE
(see warning above)

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

SHIPPER
TRAFFIC MANAGEMENT FLIGHT
5236 CHASE ST
WRIGHT PATTERSON AFB OH 45433-5501

PHONE NUMBER:
(937) 257-4409 DSN: 787-4409

AIR WAYBILL NO.

PAGE 1 OF 1 PAGES

SHIPPER'S REFERENCE NUMBER
TCN: FB230080609009XXX

CONSIGNEE
FB5612
435 ABW LRS
RAMSTEIN AB, GERMANY

COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR

WARNING

Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties

TRANSPORTATION DETAILS

THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR:
(DELETE NON-APPLICABLE)

PASSENGER AND CARGO AIRCRAFT | ~~CARGO AIRCRAFT ONLY~~

AIRPORT OF DEPARTURE:
DOV
DOVER AFB, DE

AIRPORT OF DESTINATION:
RAMSTEIN AB, GERMANY

SHIPMENT TYPE: (DELETE NON-APPLICABLE)

NON-RADIOACTIVE | ~~RADIOACTIVE~~

NATURE AND QUANTITY OF DANGEROUS GOODS

DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE of PACKING	PACKING INSTRUCTION	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
UN3166	VEHICLE, FLAMMABLE LIQUID POWERED	9		2 TRUCKS	A13.4	

ADDITIONAL HANDLING INFORMATION
GASOLINE, 3, 18.92 LITERS
1 EACH AEROSOLS, FLAMMABLE, 2.1
1 EACH FIRE EXTINGUISHER, 2.2
NON-HAZARDOUS BATTERIES INSTALLED

EMERGENCY TELEPHONE NUMBER: 1-800-851-8061 1-804-279-3131

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.

NAME/TITLE OF SIGNATORY
Jerry Jaffin
Supervisory Packaging Specialist

PLACE AND DATE
WPAFB, OH. 45433 29 Feb 2008

SIGNATURE
(see warning above)

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

SHIPPER
TRAFFIC MANAGEMENT FLIGHT
5236 CHASE ST
WRIGHT PATTERSON AFB OH 45433-5501

PHONE NUMBER:
(937) 257-4409 DSN: 787-4409

AIR WAYBILL NO.

PAGE 1 OF 1 PAGES

SHIPPER'S REFERENCE NUMBER
TCN: FB230080609100XXX

CONSIGNEE
FB5612
435 ABW LRS
RAMSTEIN AB, GERMANY

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TRANSPORTATION DETAILS

THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR:
(DELETE NON-APPLICABLE)

PASSENGER AND CARGO AIRCRAFT | ~~CARGO AIRCRAFT ONLY~~

AIRPORT OF DEPARTURE:
DOV
DOVER, AFB, DE.

SHIPMENT TYPE: (DELETE NON-APPLICABLE)

NON-RADIOACTIVE | ~~RADIOACTIVE~~

AIRPORT OF DESTINATION:
RAMSTEIN AB, GERMANY

NATURE AND QUANTITY OF DANGEROUS GOODS

DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE of PACKING	PACKING INSTRUCTION	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
UN3171	BATTERY-POWERED EQUIPMENT	9		1 Control Operation Shelter	A13.6	

ADDITIONAL HANDLING INFORMATION
2 EACH BATTERIES WET, FILLED WITH ACID, 8
1 EACH FIRE EXTINGUISHER, 2.2

EMERGENCY TELEPHONE NUMBER: 1-800-851-8061 1-804-279-3131

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.

NAME/TITLE OF SIGNATORY
AUSTIN STEWART
WAREHOUSE FOREMAN

PLACE AND DATE
WPAFB, OH. 45433 29 Feb 2008

SIGNATURE
(see warning above)

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

SHIPPER
TRAFFIC MANAGEMENT FLIGHT
5236 CHASE ST
WRIGHT PATTERSON AFB OH 45433-5501

PHONE NUMBER:
(937) 257-4409 DSN: 787-4409

AIR WAYBILL NO.

PAGE 1 OF 1 PAGES

SHIPPER'S REFERENCE NUMBER
TCN: FB230080609001XXX

CONSIGNEE
FB5612
435 ABW LRS
RAMSTEIN AB, GERMANY

COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR

WARNING

Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties

TRANSPORTATION DETAILS

THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR:
(DELETE NON-APPLICABLE)

PASSENGER AND CARGO AIRCRAFT | ~~CARGO AIRCRAFT ONLY~~

AIRPORT OF DEPARTURE:
DOV
DOVER AFB, DE

SHIPMENT TYPE: (DELETE NON-APPLICABLE)

NON-RADIOACTIVE | ~~RADIOACTIVE~~

AIRPORT OF DESTINATION:
RAMSTEIN AB, GERMANY

NATURE AND QUANTITY OF DANGEROUS GOODS

DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE of PACKING	PACKING INSTRUCTION	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
UN3072	LIFE-SAVING APPLIANCES SELF INFLATING	9		1 Fiberboard Box X 3 Inflatable Rafts	A13.12	

ADDITIONAL HANDLING INFORMATION

Store in cool, well-ventilated areas away from fire hazards and sources of heat or ignition. Do not drop or rough handle.

CARBON DIOXIDE, 2.2
FLARES, AERIAL, 1.3G
MATCHES, STRIKE ANYWHERE, 4.1

EMERGENCY TELEPHONE NUMBER: 1-800-851-8061 1-804-279-3131

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.

NAME/TITLE OF SIGNATORY
Caroline Heinz
Packing & Crating Supervisor

PLACE AND DATE
WPAFB, OH. 45433 31 Jan 2008

SIGNATURE
(see warning above)

Attachment 18

COMPATIBILITY

A18.1. General Requirements. For military members, failure to obey the mandatory provisions from **paragraphs A18.2** through **A18.4** and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from **paragraph A18.2** through **A18.4** and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall follow specific segregation /compatibility and deviation instructions for movement of hazardous cargo via military airlift. Packages containing hazardous materials that might react dangerously with one another must not be loaded or transported in a position that would allow interaction between the material in the event of leakage. Segregation requirements for hazardous material on military aircraft identified in **Table A18.1** and **Table A18.2** must be used to determine segregation requirements.

A18.1.1. **Table A18.1** details segregation requirements for all hazardous materials.

A18.1.2. **Table A18.2** specifies compatibility requirements for Class 1.

A18.1.3. **A18.4** specifies compatibility requirements for tactical and contingency operations under the authority of **Chapter 3**.

A18.2. Segregation Requirements for All Hazardous Materials. **Table A18.1** indicates the explosives and other hazardous materials that must not be loaded, transported, or stored together.

A18.2.1. Only the primary hazard class or division are considered for segregation. Subsidiary-risks and secondary hazards will not be used to determine segregation requirements when using **Table A18.1**.

A18.2.2. The absence of any hazard class or a blank space in the table indicates that no restrictions apply.

A18.2.3. The letter "X" at an intersection of horizontal and vertical columns indicates that these articles must not be loaded, transported , or stored together. For example, in **Table A18.1**, Class 3 flammable liquids, must not be loaded, transported, or stored with Class 1.1.

A18.2.4. The letter "O" at an intersection of horizontal and vertical columns indicates that these articles must not be loaded together unless separated by a 463L pallet position or not less than a distance of 2.2 m (88 inches) in all directions. For example, Class 8 corrosive liquids loaded on a 463L pallet, must not be transported with Class 4.1 flammable solids on an adjoining pallet. If loaded in a logistic rail mode (e.g., C-17), these items must be separated by 2.2 m (88 inches) and located on different pallets.

A18.2.5. The "*" at an intersection of horizontal and vertical columns indicates that segregation among different Class 1 materials is identified in **Table A18.2**.

A18.2.6. Be sure to check notes for compatibility.

A18.3. Segregation Requirements for Class 1 Materials. **Table A18.2** identifies Class 1 materials that must not be loaded, transported, or stored together.

A18.3.1. A blank space in the table indicates that no restrictions apply.

A18.3.2. The letter "X" at an intersection of horizontal and vertical columns shows that these articles must not be loaded or stored together. For example, do not load or store Class 1.2C with Class 1.2H.

A18.3.3. Unless otherwise authorized, do not pack explosives in the same outer packaging with other articles. Explosives of the same compatibility group or authorized combination of compatibility groups but a different class number may be packed together, provided that the whole package is treated as though its entire contents were comprised of the lower class number (higher hazard). For example, treat a mixed package of Class 1.2D explosives and Class 1.4D explosives as Class 1.2D explosives. However, when Class 1.5D is packed together with Class 1.2D, treat the whole package as Class 1.1D (for compatibility).

A18.3.4. Incompatible explosives may be packed together when approved according to TB 700-2/ NAVORDINST 8020.8B/TO 11A-1-47/DLAR 8220.1, *DOD Explosive Hazard Classification Procedures* or **paragraph 2.3.2**.

A18.3.5. Subsidiary-risks will not be used to determine compatibility requirements when using **Table A18.2**.

A18.3.6. Be sure to check notes for compatibility.

A18.4. **Chapter 3** Segregation/Compatibility. The requirements of **Table A18.1** and **Table A18.2** may be deviated from when transporting cargo approved to be airlifted using provisions of **Chapter 3**, consistent with operational requirements. Normally incompatible hazardous materials may be transported on the same aircraft when separated to the maximum extent possible. Compatibility waivers are not required. Use **Chapter 3** segregation/compatibility, to include complete round rigging, for exercises only when there is an intent to use or fire explosives and ammunition. The following restrictions are mandatory:

A18.4.1. Explosives in compatibility groups A, J, K, and L can only be shipped with material in compatibility group S and Class 9.

A18.4.2. Fissile class III radioactive materials (Class 7) cannot be loaded, transported, or stored on the same aircraft with any other hazardous material.

A18.4.3. Class 1.1, 1.2, and 1.3 cannot be shipped with any Inhalation hazard zone A material .

A18.4.4. Class 1.1, 1.2, and 1.3 cannot be shipped with Class 6.1 poisonous liquids, PG I.

A18.4.5. Cyanides or cyanide mixtures (Class 6.1) cannot be loaded, transported, or stored with any corrosive Class 8 material.

Table A18.1. Segregation Table for Hazardous Materials.

Class or Division Note 7 Note 10	Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 Gas Zone A	2.3 Gas Other than Zone A	3	4.1	4.2	4.3	5.1	5.2	6.1 Liquid PG I Zone A	7	8 Liquid Only
Notes		1 6					9								1		4	2 3	4, 5 6, 8
1.1 and 1.2	1 6	*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	X	X
1.3		*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	0	X
1.4		*	*	*	*	*	0		0	0	0		0				0		0
1.5		*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
1.6		*	*	*	*	*													
2.1	9	X	X	0	X				X	0			0	0	0	0	0	0	0
2.2					X														
2.3 Zone A		X	X	0	X		X				X	X	X	X	X	X			X
2.3 Other than Zone A		X	X	0	X		0				0	0	0	0	0	0			0
3		X	X	0	X				X	0		0	0	0	0	0	X		
4.1		X	X		X				X	0	0						X		0
4.2		X	X	0	X		0		X	0	0						X		X
4.3		X	X		X		0		X	0	0						X		0
5.1	1	X	X		X		0		X	0	0						X		0
5.2		X	X		X		0		X	0	0						X		0
6.1 Liquid PG I Zone A	4	X	X	0	X		0				X	X	X	X	X	X			X
7	2 3	X	0		X		0												
8 Liquid Only	4 5 6 8	X	X	0	X		0		X	0		0	X	0	0	0	X		

NOTES:

1. Ammonium nitrate fertilizer may be loaded, transported, or stored with Class 1.1 or 1.5 materials.

2. Do not load, transport, or store fissile class III radioactive material (Class 7) on the same aircraft with any other hazardous material.

3. Normal uranium, depleted uranium, and thorium metal in solid form radioactive materials (Class 7) may be loaded and transported with Class 1.1, 1.2, and 1.5 (explosives).

4. Do not load, transport, or store cyanides or cyanide mixtures (Class 6.1) with any Class 8 materials.

5. Separate nitric acid (Class 8) in carboys by 2.2 m (88 inches) in all directions from other corrosives materials in carboys when loaded on the same aircraft.

6. Do not load, transport, or store charged electric storage batteries (Class 8) on the same aircraft with any Class 1.1 or 1.2.

7. Ship the following materials with each other and with all other hazardous materials without compatibility restrictions (ensure compliance with notes 4, 5, and 6):

7.1. Class 6.1 toxic solids and liquids (other than PG I, zone A) See Note 4 concerning restrictions for cyanides or cyanide mixtures.

7.2. Class 8 solids

7.3. Class 9 (including ORM-D)

7.4. Excepted Quantities

7.5. Containers or articles drained but not purged containing 500 ml (17 ounces) or less of Class 3

8. Class 8 corrosive liquids must not be loaded above or adjacent to Class 4 (flammable solid) material or Class 5 (oxidizing) material.

9. Class 2.1 aerosol cans may be shipped with other incompatible items when separated in all directions by a minimum of 88 inches.

10. Items classified by a predominate hazard other than Class 1 but contain small amounts of explosive materials and assigned an explosive compatibility letter for storage may be shipped with Class 1 material according to Table A18.2. For example Class 4.2G may be shipped with Class 1.3G.

Table A18.2. Compatibility Table for Class 1 (Explosive) Materials.

Compatibility Group		A	B	C	D	E	F	G	H	J	K	L	N	S
	NOTES													
A			X	X	X	X	X	X	X	X	X	X	X	X
B	1, 2, 8	X		X	X	X	X	X	X	X	X	X	X	
C	8	X	X				X	X	X	X	X	X		
D	8	X	X				X	X	X	X	X	X		
E	8	X	X				X	X	X	X	X	X		
F	3	X	X	X	X	X		X	X	X	X	X	X	
G	4, 5, 7, 8	X	X	X	X	X	X		X	X	X	X	X	
H		X	X	X	X	X	X	X		X	X	X	X	
J		X	X	X	X	X	X	X	X		X	X	X	
K		X	X	X	X	X	X	X	X	X		X	X	
L	6	X	X	X	X	X	X	X	X	X	X		X	X

N	X	X				X	X	X	X	X	X		
S 7, 8	X										X		

NOTES:

1. Group "B" explosives UN0255, UN0257, UN0267, and UN0361 may be loaded and transported with groups "C," "D," and "E" explosives on cargo aircraft only. Passenger deviations are not authorized.

2. Group "B" explosives packaged in an EOD MK 663, MOD O container may be loaded and transported with groups "C" through "H" and group "S" explosives.

3. Group "F" explosives UN0292 may be loaded and transported with groups "C," "D," and "E" explosives on cargo aircraft only. Passenger deviations are not authorized.

4. Group "G" explosives UN0019, UN0300, UN0301, and UN0325 may be loaded and transported with all other explosives compatible with group "S" explosives on cargo aircraft only. Passenger deviations are not authorized.

5. Group "G" explosives UN0009, UN0018, UN0314, UN0315, UN0317, UN0319, and UN0320 may be transported with groups "C," "D," and "E" explosives on cargo aircraft only. Passenger deviations are not authorized.

6. Group "L" explosives must only be loaded and transported with an identical item.

7. Class 1.1 and 1.2 explosives must not be shipped with UN0333, UN0334, UN0335, UN0336, and UN0337.

8. Class 1.4, Compatibility Groups B and G may be loaded and transported together or with Class 1.4 Compatibility Groups C, D, and E on cargo aircraft only.

A18.5. Classification Codes and Compatibility Groups of Explosives. The classification code for an explosive consists of the class number followed by the compatibility group letter. Compatibility group letters are used to specify the controls required for transportation and storage and to prevent the additional hazard that might occur if certain types of explosives are transported or stored together. All explosives entering the Defense Transportation System must be assigned a final or interim hazard classification according to A3.3.1.4. Compatibility groups and classification codes for the various types of explosive substances and articles are identified in **Table A18.3**. Compatibility groups assigned to non-class 1 items are used for permanent storage and do not apply while item is in the Defense Transportation System.

Table A18.3. Classification Codes.

Description of Substances or Article to be Classified	Compatibility Group	Classification Code
Primary explosive substance	A	1.1A
Article containing a primary explosive substance and not containing two or more effective protective features	B	1.1B 1.2B 1.4B

Propellant explosive substance or other deflagrating explosive substance or article containing such explosive substance	C	1.1C 1.2C 1.3C 1.4C
Secondary detonating explosive substances or black powder or article containing a secondary detonating explosive substance, in each case without means of initiation and without a propelling charge, or article containing a primary explosive substance and containing two or more effective protective features	D	1.1D 1.2D 1.4D 1.5D
Article containing a secondary detonating explosive substance, without means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid)	E	1.1E 1.2E 1.4E
Article containing a secondary detonating explosive substance with its means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid) or without propelling charge.	F	1.1F 1.2F 1.3F 1.4F
Pyrotechnic substance or article containing a pyrotechnic substance, or article containing both an explosive substance and illuminating, incendiary, tear-producing or smoke producing substance (other than a water-activated article or one containing white phosphorus, phosphide or flammable liquid or gel or hypergolic liquid.	G	1.1G 1.2G 1.3G 1.4G
Article containing both an explosive and white phosphorus	H	1.2H 1.3H
Article containing both an explosive substance and flammable liquid or gel	J	1.1J 1.2J 1.3J
Article containing both an explosive substance and a toxic chemical agent	K	1.2K 1.3K
Explosive substance or article containing an explosive substance and presenting a special risk (e.g., due to water-activation or presence of hypergolic liquids phosphides or pyrophoric substances) needing isolation of each type.	L	1.1L 1.2L 1.3L
Articles containing only extremely insensitive detonating substances	N	1.6N
Substance or article so packed or designed that any hazardous effects arising from accidental functioning are limited to the extent that they do not significantly hinder or prohibit fire fighting or other emergency response efforts in the immediate vicinity of the package.	S	1.4S

Attachment 19

EXCEPTED AND LIMITED QUANTITIES

A19.1. Quantities. Excepted and limited quantities are authorized on military aircraft according to **paragraph 2.7**. These small quantities of hazardous materials are exempted from certain requirements of this manual as identified in this attachment. The provisions in this attachment do not apply to radioactive materials. See **Attachment 11** for requirements applicable to radioactive material in accepted packaging or limited quantity of material.

A19.2. Excepted Quantities. Small quantities of hazardous materials are exempt from the specification packaging, marking, labeling, certification and compatibility requirements of this manual if the provisions of this paragraph are met. Excepted quantities may be certified to this paragraph or to the most current ICAO or IATA.

A19.2.1. Do not ship the following material as an excepted quantity:

A19.2.1.1. Class 1 material.

A19.2.1.2. Class 2, division 2.1 and 2.3; division 2.2 material having a subsidiary risk; or aerosols.

A19.2.1.3. Material having a primary or subsidiary risk of Class 4 in PG I.

A19.2.1.4. Class 4.1 self-reactive material.

A19.2.1.5. Material having a primary or subsidiary risk of Class 5 in PG I, except when contained in a chemical kit or first aid kit.

A19.2.1.6. Material having a primary or subsidiary risk of Class 6.1, in PG I, by reason of inhalation toxicity.

A19.2.1.7. Class 6.2 Infectious substances.

A19.2.1.8. Class 7 Radioactive material other than when radioactive material is excepted packages with an associated risk of another class.

A19.2.1.9. Material having a primary or secondary risk of Class 8 in PG I, UN2803 and UN2809.

A19.2.1.10. Magnetized Material (Class 9), Carbon Dioxide Solid, and Lithium Batteries.

A19.2.1.11. Hazardous material contained within a device that is a component part of an otherwise nonhazardous item (except for temperature sensing devices) such as mercury switches in electrical equipment. Prepare the hazardous material according to the requirements for the hazard. If the material is not regulated as a hazardous material, ship the item as general cargo.

A19.2.1.12. Material identified as “Cargo Aircraft Only” in **Table A4.1**.

A19.2.2. Maximum Net Quantity for Excepted Quantities. The maximum net quantity of hazardous material that is allowed in each inner packaging and the total net quantity allowed in each outer packaging are given in **Table A19.1**. Refer to A19.2.1. to determine if the material qualifies for the excepted quantities provision and that **Table A19.1** is applicable. If

the quantity limitations of **Table A19.1** are exceeded, the excepted quantity provision must not be used and the material must be prepared according to the requirements for the individual material.

Table A19.1. Excepted Quantity Limits for Inner and Outer Packaging.

Class of Primary or Subsidiary Risk	Packing Group	Quantity Limits	
		Inner Packagings	Outer Packagings
2.2	See (note 1) and (note 2)	See (note 1) and (note 2)	See (note 1) and (note 2)
3	Packing Group I, II and III	30 mL	PG I 300 mL PG II 500 mL PG III 1 L
4	Packing Group II and III	30 g or 30 mL	PG II 500 g or 500 mL PG III 1 kg or 1 L
5 (note 3)	Packing Group II and III	30 g or 30 mL	PG II 500 g or 500 mL PG III 1 kg or 1 L
6	Packing Group I, II and III	PG I 1g or 1 mL PG II 1g or 1 mL PG III 30g or 30 mL	PG I 300g or 300 mL PG II 500g or 500 mL PG III 1 kg or 1 L
8 (note 4)	Packing Group II and III	30 g or 30 mL	PG II 500 g or 500 mL PG III 1 kg or 1 L
9 (note 5)	Packing Group II and III	30 g or 30 mL	PG II 500 g or 500 mL PG III 1 kg or 1 L

NOTES:

1. Packing groups are not used for this hazard class.

2. For inner packaging, the quantity contained in each receptacle must not exceed a water capacity of 30 ml. For outer packaging, the sum of the water capacities of all the inner packaging must not exceed 1 L.

3. Applies only to organic peroxides when contained in a chemical kit or a first aid kit.

4. Class 8, UN1774, UN2794, UN2795, UN2800, UN2803, UN2809, UN3028 and UN3477 are not permitted in excepted quantities.

5. For Class 9 material, if no PG is given in Table A4.1, PG II quantities must be used.

A19.2.3. Inner Packaging. Each inner packaging must be plastic (with a minimum thickness of 0.2 mm), glass, earthenware, or metal. The inner packaging must not react with, or be decomposed by, the material contained therein.

A19.2.4. Closures. Closures must be held securely, tightly, and effectively in place with tape, self-shrink plastic, wire, or other positive means.

A19.2.5. Liquids. Liquids must not completely fill inner packaging at a temperature of 55 degrees C (130 degrees F).

A19.2.6. Intermediate Packaging. Securely pack each inner packaging in an intermediate packaging with cushioning material. The intermediate packaging must completely contain the contents in case of breakage or leakage, regardless of packaging orientation. For liquid hazardous material, the intermediate packaging must contain sufficient absorbent cushioning material to absorb the entire contents of the inner packaging.

A19.2.7. Outer Packaging. Securely pack the intermediate packaging in a strong, rigid, outer packaging (i.e., fiberboard, wood).

A19.2.8. Overpacks. Overpacks may be used and may contain packages of nonhazardous material. All material in the same outer packaging and overpack must be compatible.

A19.2.9. Dimensions of Outer Package. Two of three outside dimensions of the outer package must measure at least 100 mm (4 inches). If the outer package is in the shape of a cylinder, it must have a minimum height and diameter of 100 mm (4 inches) each.

A19.2.10. Other Hazardous Materials and Materials in Excepted Quantities. A package containing hazardous material in excepted quantities must not contain other hazardous material that are regulated by this manual (requires a Shipper's Declaration for Dangerous Goods).

A19.2.11. Different Materials in One Outer Packaging. When different hazardous materials are contained in one outer packaging, use the formula listed below to determine the quantities that can be included in one outer packaging. The quantities of different hazardous materials contained in each outer packaging must be such that "Q" is less than or equal to 1.0, "Q" is calculated using the formula: nl/Ml + n2/M2 + n3/M3 = Q (nl, n2, etc. is the actual net quantity of each different hazardous material. Ml, M2, etc. is the maximum net quantity permitted for the material and packing group in the outer packaging according to **Table A19.1**) For example:

A19.2.11.1. There are 15 inner packages at 20 ml each of Class 3, PG II , and 5 inner packages at 30 ml each of Class 8, PG II in one outer packaging: 300 ml/500 ml + 150 ml/500 ml = 0.6 + 0.3 = 0.9. The result is less than 1.0, so the material can be shipped in one outer packaging.

A19.2.11.2. There are 5 inner packages at 30 ml each of Class 3, PG II, and 15 inner packages at 30 g each of Class 8, PG II in one outer packaging: 150 ml/500 ml + 450 g/500 g = 0.3 + 0.9 = 1.2. The result is greater than 1.0, so the item cannot be shipped in one outer packaging.

A19.2.12. Package Performance Tests. The complete package (inner plus outer packaging), must be capable of withstanding the test specified in A19.2.12.1. without breakage or leakage of the inner packaging and without significant reduction in effectiveness. Tests must be carried out on the packaging prepared as for transport. Inner receptacles must contain at least 95 percent of their capacity for solids and 98 percent of their capacity for liquids. The material to be transported in the packaging may be replaced by another material, except where this would invalidate the results of the tests. When another material is substituted for a solid, the material must have the same physical characteristics (i.e., mass, grain size) as the

material to be shipped. When another material is substituted in the drop test for liquids, its relative density (specific gravity) and viscosity shall be similar to the material to be shipped.

A19.2.12.1. For packaging with six sides (i.e., fiberboard box), the following free drops onto a solid, unyielding, flat, and horizontal surface from 1.8 m (6 feet) is required. Each test may be performed on different but identical containers.

A19.2.12.1.1. One drop flat on the bottom.

A19.2.12.1.2. One drop flat on the top.

A19.2.12.1.3. One drop flat on the long side.

A19.2.12.1.4. One drop flat on the short side.

A19.2.12.1.5. One drop on a corner at the junction of three intersecting edges.

A19.2.12.2. For cylindrical packaging, the following free drops onto a solid, unyielding flat and horizontal surface from 1.8 m (6 feet) is required:

A19.2.12.2.1. One drop diagonally on chime or circumferential seam edge.

A19.2.12.2.2. One drop on the weakest part (i.e., a closure) not tested by the first drop.

A19.2.12.3. A force applied to the top surface for a duration of 24 hours, equivalent to the weight of identical packages if stacked to a height of 3 m (10 feet), including the test sample.

A19.2.13. Package Marking. Excepted quantities of hazardous materials packaged, marked, and otherwise offered and transported in accordance with this paragraph must be durably and legibly marked with the following marking:

Figure A19.1. Excepted Package Marking.

A19.2.13.1. The "*" must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The "**" must be replaced by the name of the shipper or consignee if not shown elsewhere on the package.

A19.2.13.2. The marking must not be less than 100 mm (3.9 inches) by 100 mm (3.9 inches), and must be durable and clearly visible. The hatchings and symbol must be of the same color red or black, and on a white background or contrasting color.

A19.2.13.3. Markings, labels, and documentation required by **Attachments 14**, **15**, and **17** do not apply to these shipments.

A19.3. Dangerous Goods in Limited Quantities. Limited quantities may be certified to this paragraph or to the most current ICAO or IATA. Comply with all requirements of the document used including the inner packaging and outer packaging quantity limits. Pack limited quantities in good quality combination packagings using only the inner and outer packaging combinations authorized. The packagings must also meet the general packaging requirements of **Attachment 3**. Single packagings, including composite packagings, are not permitted. The gross weight of a "limited quantity" package must not exceed 30 Kg (66 pounds). Quantity limits must not exceed the amounts authorized by **Table A19.2**. If all the requirements of this paragraph and the quantity limits of **Table A19.2** are met, the combination packaging need not meet (or be marked) with the UN packaging specification requirements.

A19.3.1. Dangerous Goods not Permitted in Limited Quantities:

A19.3.1.1. Materials forbidden in **Table A4.1**.

A19.3.1.2. All materials in PG I.

A19.3.1.3. Class 1 and 7 materials except as provided in 49 CFR §173.63.

A19.3.1.4. Class 2.3 and 6.2.

A19.3.1.5. Class 2.1 and 2.2 materials (other than UN1950 and UN2037).

A19.3.1.6. Refrigerated liquefied gases.

A19.3.1.7. Class 4.1 self-reactive substances.

A19.3.1.8. Class 4.2 or any material with a subsidiary risk of 4.2.

A19.3.1.9. Class 8 materials with UN numbers of 2794, 2795, 2803, 2809 or 3028.

A19.3.1.10. Class 9 materials except those specifically authorized in A19.3.2.

A19.3.1.10. Class 9 materials except those specifically authorized in A19.3.2.

A19.3.1.11. Materials identified as “Cargo Aircraft Only” in **Table A4.1**.

A19.3.2. Dangerous Goods Permitted in Limited Quantities:

A19.3.2.1. Cartridges, small arms, and Cartridges power device (used to project fastening devices) Division 1.4S as provided in 49 CFR §173.63.

A19.3.2.2. Aerosols UN1950 and UN2037 of Class 2.1 and 2.2 without a subsidiary risk.

A19.3.2.3. Gases of Class 2.2 without a subsidiary risk (excluding refrigerated liquefied gases).

A19.3.2.4. Class 3 (excluding PG I).

A19.3.2.5. Class 4.1 (excluding PG I and Class 4.1 self-reactive substances).

A19.3.2.6. Class 4.3 solids only (excluding PG I).

A19.3.2.7. Class 5.1 (excluding PG I).

A19.3.2.8. Class 5.2 only when contained in a "Polyester Resin Kit (UN3269)," Chemical Kit (NA 1760)" or "First Aid Kit (" (excluding PG I).

A19.3.2.9. Class 6.1 (excluding PG I).

A19.3.2.10. Class 8 (excluding PG I, UN2794, UN2795, UN2803, UN2809 and UN3028).

A19.3.2.11. Only the following items of Class 9: Ammonium Nitrate Fertilizers (UN2071), Benzaldehyde (UN1990), Environmentally Hazardous Substance Solid N.O.S. (UN3077), Environmentally Hazardous Substance Liquid N.O.S. (UN3082), Chemical Kit or First Aid Kit (UN3316) and Dibromodifluoromethane (UN1941).

A19.3.3. Different Dangerous Goods in Limited Quantities in one Package. When different dangerous goods in limited quantities are packed together in one outer packaging, the quantities must be as follows:

A19.3.3.1. Class 3 and 8, and Class 4.1, 4.3 (solid), 5.1, 5.2, and 6.1 must not exceed the lowest net quantity per package (of the most restrictive single material in the package) as listed in **Table A19.2**. For calculation purposes, when a package contains both liquid and solids, convert the quantities for the liquids into kilograms in order to determine that the permitted maximum net quantity per package has not been exceeded. The "Q" value formula is not applicable for limited quantities.

A19.3.3.2. Class 2 and 9, when packed without any other dangerous goods, the gross weight of the package must not exceed 30 Kg (66 pounds).

A19.3.3.3. Class 2 and 9, when packed with other dangerous goods, must meet the requirements of A19.3.3.2. In addition, the maximum net quantity of all the other dangerous goods (other than class 2 and 9) must not exceed the requirements of A19.3.3.1.

A19.3.4. Package Performance Tests. Limited quantity packages must meet the following test requirements:

A19.3.4.1. The package, as prepared for transport, must be capable of withstanding a 1.2 m (4 foot) drop test onto a rigid, nonresilient, flat, horizontal surface, in a position most likely to cause the most damage. After the test, the package must not show any damage that is likely to affect safety during transport and there must be no leakage from the inner packagings.

A19.3.4.2. Each package offered for transport must be capable of withstanding a force applied to the top surface of the package (for a duration of 24 hours) equivalent to the total weight of identical packages if stacked to a height of 3 m (9.8 feet). The stack height includes the test sample. There cannot be any significant reduction in the package's effectiveness and there cannot be any breakage or leakage of any inner packaging.

A19.3.4.3. Liquids must meet air-eligible requirements of A3.1.7.

Table A19.2. Limited Quantity Limits - Classes 2 Through 9.

Class or Division	Packing Group	Physical State	Inner Packaging	Per Package
1.4S	See 49 CFR §173.63			
2	--	Gas (note 2)	120 mL (note 3)	30 kg G
3	II	Liquid	500 mL	1 L
	III	Liquid	5 L	10 L

Class or Division	Packing Group	Physical State	Inner Packaging	Per Package
4.1	II	Solid	500 g	5 kg
	III	Solid	1 kg	10 kg
4.3	II	Solid	500 g	5 kg
	III	Solid	1 kg	10 kg
5.1	II	Liquid	100 mL	500 mL
	II	Solid	500 g	2.5 kg
	III	Liquid	500 mL	1 L
	III	Solid	1 kg	10 kg
5.2	--	Liquid	30 mL	1 kg
	--	Solid	100 g	1 kg
6.1	II	Liquid	100 mL	1 L
	II	Solid	500 g	1 kg
	III	Liquid	500 mL	2 L
	III	Solid	1 kg	10 kg
8 (note 1)	II	Liquid	100 mL	500 mL
	II	Solid	500 g	5 kg
	III	Liquid	500 mL	1 L
	III	Solid	1 kg	5 kg
9 (note 1)	III	Liquid/Solid	5 L	30 kg G

NOTES:

1. Chemical or First Aid Kits: In inner receptacles of no more than 30 ml for liquids or 100g for solids. The total quantity of hazardous materials in any one kit must not exceed 1 kg.

2. For gases, the quantity is the water capacity of the inner packaging.

3. Aerosols containing only a nontoxic substance or substances in inner nonrefillable metal or plastic receptacles, the capacity of the inner packaging must not exceed 1000 mL (34 fluid ounces).

A19.3.5. Marking, Labeling and Certification. Limited quantity packages must be marked labeled and certified as required by **Attachments 14**, **15**, and **17** of this manual.

Attachment 20

ABSORBENT CUSHIONING REQUIREMENTS

A20.1. Absorbent Material General Requirements. For combination packagings, use cushioning materials suitable for the absorption of liquid hazardous materials in the event of leakage from the primary receptacle. Ensure cushioning materials used are satisfactory in all respects. Ensure the material is not capable of reacting adversely with the contents of the package and is noncombustible. Do not use asbestos. The following requirements apply to the use of absorbent cushioning material for combination packagings containing liquid hazardous materials:

A20.1.1. Each package containing a liquid in PG I must include sufficient cushioning material to absorb the entire contents of the inner containers.

A20.1.2. Each package containing a liquid in PG II must include sufficient cushioning material to absorb the contents of any one inner container. If the inner containers vary in size, include sufficient cushioning material to absorb the contents of the inner receptacle containing the greatest quantity of liquid.

A20.1.3. Absorbent cushioning material is not required for:

A20.1.3.1. Paint in PG II

A20.1.3.2. Liquids in PG III (if inner receptacles are other than glass or earthenware)

A20.1.3.3. Consumer Commodities (if inner receptacles are other than glass or earthenware)

A20.1.3.4. Materials authorized by A17.1.2 certified to and prepared per an IATA packaging instruction requiring a secondary means of maintaining inner packaging closures or a leakproof liner in lieu of absorbent materials.

A20.1.4. When overpacking containers of liquids that do not meet pressure requirements into containers that meet the pressure requirement, use absorbent cushioning material as stipulated above.

A20.1.5. When absorbent cushioning material is required and/or the outer packaging is not liquid-tight, use a means of containing the liquid in the event of leakage. Use a leak-proof liner, plastic bag, or other equally efficient means of containment specified in packaging or closure instructions according to A3.1.2. Thickness of liners and polyethylene bags will be as specified in test report.

A20.1.6. When the outer packaging is not liquid-tight and absorbent cushioning material is not required , use a leak-proof liner, plastic bag, or other equally efficient means of containment. When securely closed polyethylene bags are used to contain the cushioning of the hazardous liquid, the bags must be of sufficient size to form a liner for the exterior container , or a bag for the interior container. Thickness of liners and polyethylene bags will be as specified in test report.

A20.1.7. When overpacking individual packagings for consolidation that already meet air-eligibility requirements use enough cushioning material to secure and position the packagings against damage. The cushioning material, absorbent or nonabsorbent, must completely fill any void space in the container.

A20.1.8. Absorbent cushioning material is not required for containers that have met the UN packaging specification test requirements (including the hydrostatic pressure test) as a single or composite packaging.

A20.2. Determining the Amount Required. Use **Table A20.1** as a guide to determine the amount of vermiculite or diatomaceous earth required for overpacking and cushioning liquid hazardous materials. Other equivalent cushioning materials may be used to meet A20.1. requirements.

A20.2.1. The amounts identified in **Table A20.1** are the minimum requirements. When exact quantities of cushioning materials are not found in **Table A20.1**, make an approximation based on quantities listed.

A20.2.2. When placing cushioning materials into the container, consider settling of the cushioning materials during transportation. Use enough cushioning material to compensate for any settling that may occur.

A20.2.3. When the applicable test report identifies an amount larger than **Table A20.1**, use the amount identified in the test report.

Table A20.1. Absorbent Material Requirements in Inches.

If quantity is	Then to ship use: Vermiculite, Type 1, Grade 3 (fine), or Type 1, Grade 4 (super fine) Centimeters (inches)		Diatomaceous Earth Centimeters (inches)	
	On sides	On top and bottom	On sides	On top and bottom
.50 L (1 pt)	2.54 cm (1.0)	3.81 cm (1.5)	5.08 cm (2.0)	11.43 cm (4.5)
1.0 L (1 qt)	2.54 cm (1.0)	5.08 cm (2.0)	5.08 cm (2.0)	13.97 cm (5.5)
3.8 L (1 gal)	3.81 cm (1.5)	6.35 cm (2.5)	10.16 cm (4.0)	15.24 cm (6.0)
7.6 L (2 gals)	5.08 cm (2.0)	10.16 cm (4.0)	11.43 cm (4.5)	24.13 cm (9.5)
19.0 L (5 gals)	7.62 cm (3.0)	15.24 cm (6.0)	15.24 cm (6.0)	34.29 cm (13.5)
24.6 L (6.5 gals)	8.89 cm (3.5)	16.51 cm (6.5)	17.78 cm (7.0)	36.83 cm (14.5)
49.3 L (13 gals)	10.16 cm (4.0)	19.05 cm (7.5)	20.32 cm (8.0)	39.37 cm (15.5)
56.8 L (15 gals)	11.43 cm (4.5)	20.32 cm (8.0)	24.13 cm (9.5)	45.74 cm (18.0)

Attachment 21

BRIEFING AGENCY REQUIREMENTS

A21.1. Briefing Agency. This attachment outlines the information that the briefing agency is required to provide to the aircraft commander (or designated representative) according to **paragraph 1.2.9**.

A21.2. Informational Requirements. The briefing agency must advise the aircraft commander (or designated representative) of:

A21.2.1. The identification number, PSN, hazard class, and PG prescribed in this manual for each hazardous material aboard the aircraft.

A21.2.2. The total quantity in weight or volume.

A21.2.3. The location of the hazardous item in the aircraft.

A21.2.4. Net explosive weight (NEW) of Class 1.1, 1.2, and 1.3 explosives, or of Class 1.4, 1.5, and 1.6 explosives when required.

A21.2.5. The requirement for escorts, couriers, and protective equipment.

A21.2.6. The number of passengers permitted aboard the aircraft.

A21.2.7. The procedures to use in an emergency when identified in Key 19 of the Shipper's Declaration For Dangerous Goods.

A21.2.8. Use of DOT-SP 7573 and DOT-SP 9532 and provide copy of these special permits, as applicable to AMC contract air carriers.

A21.2.9. Transport of incompatible explosives and other hazmat approved according to **paragraph 2.3.2**. Provide an indication of the compatibility waiver and issuing authority to the aircrew commander (or designated representative).

A21.3. Notification Statements. The briefing agency must include a statement on the hazardous cargo manifest when transporting hazardous materials on aircraft. Apply these statements by programmed wording, rubber stamps, or typewriter. Examples are provided below.

A21.3.1. Air terminal inspection certification statement: "ALL HAZARDOUS MATERIALS COVERED BY THIS MANIFEST HAVE BEEN INSPECTED AND FOUND TO BE PACKAGED IN THE PROPER OUTSIDE CONTAINER, FREE OF VISIBLE DAMAGE AND LEAKS, AND IS PROPERLY CERTIFIED." (Air terminal representative signature).

A21.3.2. Aircrew briefing certification statement: "I HAVE BEEN BRIEFED ACCORDING TO AFMAN 24-204_IP, PARAGRAPH 1.2.9., ON HAZARDOUS CARGO COVERED BY THIS MANIFEST." (Aircraft crewmember signature)

A21.4. Post Briefing Responsibilities. After receiving the briefing, the aircraft commander (or designated representative) will:

A21.4.1. Sign the cargo manifest.

A21.4.2. Return the signed copy, with the attached Shipper's Declaration for Dangerous Goods to the terminal record-keeping activity for retention.

A21.4.3. When crew changes occur, terminal personnel will brief the oncoming aircraft commander or designated representatives required by A21.2. The briefing must cover all hazardous materials (onload and throughload).

A21.4.4. For throughload hazardous cargo, the oncoming aircraft commander (or designated representative) signs a copy of the throughload manifest indicating that the briefing has been received.

A21.4.5. Keep the manifest, reflecting the certification for a hazardous cargo briefing, according to current files, maintenance, and disposition instructions.

Attachment 22

PASSENGER MOVEMENT ON AIRCRAFT TRANSPORTING HAZARDOUS MATERIALS

A22.1. Passenger Eligibility. **Table A4.1**, column 7 provides passenger eligibility codes that identify passenger movement restrictions with hazardous materials.

A22.1.1. Use **Table A4.1** and **Table A4.2** to determine passenger movement eligibility with a specific material.

A22.1.2. Do not move passengers with cargo coded as "Cargo Aircraft Only" unless exempted by this manual. Obtain a passenger deviation when required by this attachment. Passenger deviations may not be issued for contracted commercial aircraft.

A22.1.3. Aircraft transporting personnel located in the same compartment with hazardous materials, which may produce toxic, corrosive, or irritating fumes or has the capability to displace oxygen, must be equipped with serviceable supplemental oxygen equipment and oxygen supply for all personnel in addition to the aircraft's emergency oxygen system. Supplemental oxygen is not required when transporting Air, refrigerated liquid; and Engines, internal combustion.

A22.1.4. Participants in tactical, contingency, emergency, or deployment operations, including exercises transported on military organic aircraft according to DTR 4500.9-R, Part III are not considered passengers for the purposes of this manual. Also, applies to military aircraft operating a Special Assignment Airlift Mission (SAAM) providing an exclusive service for movement of unit personnel and their associated cargo.

A22.1.5. Do not transport medical evacuees or release passenger seats to non-participants if any one of the provisions of **paragraph 3.6** are being used. Refer to **Attachment 23** for contract airlift of personnel under DOT-SP 9232.

A22.1.6. Passenger Deviations. Move passengers with hazardous materials coded as "Cargo Aircraft Only" consistent with operational requirements. Prevent exposure of passengers to the hazardous material. A deviation authorizing the movement of passengers with cargo aircraft only material is granted only for exceptional cases.

A22.1.6.1. MAJCOM, Numbered Air Force, or Service having operational control of the aircraft will establish procedures for approving passenger deviations.

A22.1.6.2. When a deviation has been approved, type, print, or stamp on all copies of the passenger manifest the following information: "AUTHORITY TO MOVE PASSENGERS WITH CARGO AIRCRAFT ONLY CODED MATERIAL IS APPROVED. DEVIATION NUMBER:_____."

A22.1.6.3. Separate passengers from the hazardous cargo.

A22.1.6.4. An aircrew member must provide surveillance to ensure passengers are safe and maintain a maximum distance from the hazardous cargo.

A22.1.6.5. Deviations are not required for:

A22.1.6.5.1. Participants (see **Attachment 1**)

A22.1.6.5.2. Guards.

A22.1.6.5.3. Couriers.

A22.1.6.5.4. Technical escorts responsible for cargo.

A22.1.6.5.5. Crew chiefs and maintenance personnel assigned to support the aircraft transporting the hazardous material.

A22.1.6.5.6. DOD duty/space required passengers transported with material coded P4 in column 7 of **Table A4.1**.

A22.1.7. Radioactive Material Passenger Loading Restrictions.

A22.1.7.1. Packages with a radioactive Category II-Yellow or Category III-Yellow label may not be transported on aircraft carrying passengers unless:

A22.1.7.1.1. The total transport index is not over 50.

A22.1.7.1.2. The transport index is not over 3.0 for a package required to be labeled radioactive Category III-Yellow.

A22.1.7.1.3. The radioactive material is intended for use in, or incident to, research, medical diagnosis, or treatment.

A22.1.7.2. Radioactive material requiring a label must be separated from personnel and passengers by the greatest distance possible.

A22.1.7.3. Do not carry passengers on aircraft transporting Type B(M) packages.

A22.2. Carriage of Hazardous Materials by Passengers. Passengers must not carry hazardous materials on military aircraft. The exceptions listed below are not subject to any other requirements of this manual (nonregulated) when carried by a crewmember or passenger.

A22.2.1. Material in aerosol containers not exceeding 473.1 ml (16 fluid ounces) or 2.205 kg (1 pound) per container when carried in crewmember or passenger baggage (including carry-on baggage), unless they are classified as poisonous or irritating material. The total quantity of the excepted articles carried by any crewmember or passenger in carry-on or checked baggage must not exceed 2136 g or 2217.8 ml (75 net weight ounces and fluid ounces).

A22.2.2. Oxygen, or any hazardous material used for the generation of oxygen, carried for medical use by a passenger on a military aircraft must be an approved cylinder as listed in **Attachment 6**. Spare cylinders are not authorized. Portable oxygen concentrators approved by the FAA may also be used by passengers. Passengers, other than duty passenger medical patients, must have a physician's medical certificate as similarly required by FAA identifying need for supplemental oxygen. Comply with 14 CFR §121.574 or §135.91 for DOD contracted civilian passenger aircraft.

A22.2.3. For human beings or animals with an implanted medical device, such as a heart pacemaker, that contains radioactive material or with radio-pharmaceuticals, that have been injected or ingested.

A22.2.4. Carbon dioxide gas cylinders worn by passengers for the operation of mechanical limbs. Spare cylinders of a similar size for the same purpose, in sufficient quantities to ensure

an adequate supply for the duration of the journey are authorized in carry-on and checked baggage.

A22.2.5. Electronic devices acceptable for consumer use that contain lithium batteries. Includes, but not limited to laptop computers, cameras, cell phones, watches, etc. There is no limit on the number lithium ion (rechargeable) batteries not exceeding 8 grams equivalent lithium per battery or lithium metal (non-rechargeable) batteries not exceeding 2 grams of lithium per battery when installed in a device or carried as spares. Larger lithium ion batteries (between 8 grams and 25 grams equivalent lithium content) for consumer use electronic devices are limited to two (2) per passenger whether installed, carried as spares or in combination. Spare lithium ion and lithium metal batteries must be individually protected to prevent short circuit and will not be placed in checked baggage. Devices with installed lithium ion and lithium metal batteries placed in carry-on or checked baggage must be packed to prevent accidently activation during transport.

A22.2.6. Catalytic hair curlers containing hydrocarbon gas carried in carry-on or checked baggage. The safety cover must be securely fitted over the heating element. Gas refills are not permitted. Not more than one curler per person is authorized.

A22.2.7. Alcoholic beverages not exceeding 70 percent by volume, when packed in receptacles of less than 5 L may be in carry-on or checked baggage.

A22.2.8. Dry ice, in quantities not exceeding 2.5 kg (5.5 pounds) per passenger when used to pack perishables in carry-on or checked baggage, provided the package permits the release of carbon dioxide gas.

A22.2.9. Safety matches or a lighter carried by an individual for use by the individual. However, lighters containing unabsorbed liquid fuel (other than liquefied gas), lighter fuel and lighter refills are not permitted on one's person or in checked or carry-on baggage.

A22.2.10. Packaged small arms cartridges (in Class 1.4S), in quantities authorized in DTR 4500.9-R, , Part I may be in checked baggage. Do not combine allowances for more than one passenger into one or more packages.

A22.2.11. Wheelchairs or other battery-powered mobility devices with spillable or non-spillable batteries, provided that the battery is disconnected, battery terminals are insulated to prevent accidental short circuits and the battery is securely attached to the wheelchair or mobility device may be carried in checked baggage. Load and store batteries attached to these devices with their filling holes upright.

A22.2.12. A mercurial barometer carried by a representative of a government weather bureau or other similar official agency may be in carry-on baggage. However, package the barometer in a strong outer packaging, having a sealed inner liner or a bag of strong leak proof and puncture-resistant material impervious to mercury, which will prevent the escape of mercury from the package irrespective of its position.

A22.2.13. One small carbon dioxide cylinder fitted into a self-inflating life jacket plus one spare cartridge may be carried in carry-on and checked baggage. However, the life jackets cannot contain any explosives, pyrotechnic, or flammable devices.

A22.2.14. Heat producing articles such as underwater torches (diving lamps) and soldering irons may be in carry-on baggage.

A22.2.15. Scuba diving tanks containing not more than 25 pounds per square inch at 21 degrees C (70 degrees F) may be shipped as checked baggage. A tag or label must be affixed to the tank by a dive shop or licensed individual to indicate service was performed.

A22.2.16. Consumer electronic devices (e.g., cameras, cell phones, laptop computers and camcorders) may powered by flammable liquid, formic acid or butane fuel cell systems may be hand-carried by passengers provided the fuel cells are marked “Approved For Carriage In Aircraft Cabin Only.” No more than two spare fuel cell cartridges are permitted in carry-on baggage. Electronic devices containing fuel cells and spare cartridges will not be placed in checked baggage.

Attachment 23

USE OF CONTRACT AIR CARRIERS

A23.1. Contract Air Carriers. Airlift of military hazardous materials utilizing contract air carriers approved by HQ Air Mobility Command (HQ AMC) to transport hazardous materials is authorized according to Department of Transportation Special Permits (DOT-SP) 7573 and 9232, DTR 4500.9-R, Part III, 49 CFR §173.7(a), and this manual.

A23.2. DOT-SP 7573. The DOD is authorized to transport hazardous materials via AMC commercial contract cargo aircraft under the authority of DOT-SP 7573 according to the following conditions:

A23.2.1. The pilot in charge is notified in writing that the permit is being used and a copy of DOT-SP 7573 must accompany the shipment. See **Attachment 21** for the statement required on the hazardous cargo manifest and briefing requirements.

A23.2.2. Stamp or mark shipping papers (cargo manifest), "DOT-SP 7573 Applies."

A23.2.3. Hazardous material shipments are in complete compliance with this manual.

A23.2.4. Segregation compatibility requirements of **Table A18.1** and **Table A18.2** apply.

A23.2.5. Comply with A13.4. or A13.5. for vehicle and SE fuel levels.

A23.2.6. Ensure compliance with all other requirements of the permit.

A23.3. DOT-SP 9232. Comply with DOT-SP 9232 and this manual. USTRANSCOM is approval authority for this permit. USTRANSCOM may implement all or only portions of DOT-SP 9232 or apply additional restrictions when permit is used during a declared national emergency; in defense crisis conditions which require the activation of any state of the Civil Reserve Air Fleet (CRAF) program, or the use of foreign-flag aircraft made available to the United States Government (USG) pursuant to formal security agreements between the USG and the involved foreign government; or during rapid deployment of US armed forces.

A23.3.1. Cargo Aircraft. The following special provisions apply:

A23.3.1.1. Comply with provisions of DOT-SP 7573 and A23.2. (with the exception of stamping or marking shipping papers "DOT-SP 7573 Applies").

A23.3.1.2. Stamp or mark shipping papers (cargo manifest), DOT-SP 9232 Applies."

A23.3.1.3. Based on operational requirements, segregation requirements of A18.4. may be used.

A23.3.1.4. Do not remove hazardous materials from required packaging and place in equipment, vehicle racks, or containers.

A23.3.2. Passenger Aircraft. The following special provisions apply:

A23.3.2.1. Package and certify hazardous materials shipped as cargo according to this manual.

A23.3.2.2. Stamp or mark shipping papers (cargo manifest), "DOT-SP 9232 Applies."

A23.3.2.3. Individual issue hazardous materials may only be removed from outer packaging when needed to meet operational requirements. The troop commander must identify to the aircraft commander (or designated representative) in writing, any hazardous materials removed from outer packaging, that are in rucksacks or field packs, which are not already included on the cargo manifest according. Identify hazardous materials by PSN, hazard class, UN identification number, PG, and net quantity. Hazardous materials must be packaged to prevent accidental initiation or release.

A23.3.2.4. Load hazardous materials only in the cargo compartment. Hazardous materials (including small arms ammunition) are not authorized in the passenger compartment.

A23.3.2.5. Do not remove hazardous materials from required packaging and place in equipment, vehicle racks, and containers.

A23.4. Use of Passenger Carrying Aircraft. When requirements dictate movement of hazardous materials as cargo on commercial passenger aircraft, contracted to AMC, for other than a national emergency, ensure the material is prepared according to 49 CFR Parts 100-199. Type and quantity of material authorized will be according to 49 CFR §172.101 for passenger carrying aircraft. This manual may be used for hazardous materials certification. Do not transport hazardous materials in passenger compartment.

Attachment 24

SPECIAL CARGO REQUIREMENTS

A24.1. Material Requiring SAAM Airlift. This attachment identifies requirements for technical escorts and other extensive protective measures for extremely hazardous materials. The provisions of this attachment apply to the following shipments:

A24.1.1. Material identified in **Table A4.1** as Special Provision 1 (P1) which include, but are not limited to, Class 6.1, PG 1, hazard zone A and Class 2.3 hazard zone A toxic material, and Infectious Substances, Affecting Humans.

A24.1.2. Class 1, compatibility group K.

A24.1.3. Fissile Class III Radioactive Material.

A24.1.4. Class 7, Category III-Yellow material with a Transport Index greater than 10.

A24.1.5. Any other material determined to need technical escorts for safety concerns.

A24.2. Transportation Requirements.

A24.2.1. Transport the materials identified in A24.1. by Special Assignment Airlift Mission (SAAM) on military organic aircraft. Process SAAM requests, cargo clearance, and appropriate confirmations according to DTR 4500.9-R.

A24.2.2. When Class 6.1, PG I, hazard zone A and Class 2.3, hazard zone A toxic materials, or Infectious Substances, Affecting Humans (UN2814) are shipped by air, the consignor is required to furnish or ensure availability of:

A24.2.2.1. Complete protective clothing and equipment for all aircrew members.

A24.2.2.2. Qualified technical escort personnel, applicable decontamination and detection equipment or supplies, and suitable first-aid equipment or supplies to cope with leaking containers during airlift.

A24.2.3. Fissile class III shipments and Class 7, Category III-Yellow material with a Transport Index greater than 10, must incorporate transportation controls that are performed by the shipper or carrier, as appropriate, to provide nuclear criticality safety.

A24.2.3.1. Transport Fissile class III and Class 7, Category III-Yellow material with a Transport Index greater than 10, on aircraft assigned to the exclusive use of the shipper with a specific restriction for the exclusive use to be provided in the appropriate arrangements between shipper and carrier and with instructions to that effect issued with the shipping papers.

A24.2.3.2. Protect Fissile class III against loading, storing, or transporting that shipment with any other fissile material and any other packages of radioactive material requiring one of the labels prescribed in **Attachment 15**.

A24.2.4. Exceptions. Service focal points may waive SAAM requirements for the following:

A24.2.4.1. Liquids with a mist Inhalation Zone A, PG I hazard, less than 5 L per package, and solids with a toxic Inhalation hazard Zone A, PG I hazard, less than 15 kg per package. Passenger prohibition code "P2" applies.

A24.2.4.2. Infectious Substance, Affecting Humans (UN2814) less than 4 L or 4 Kg per package. Passenger prohibition code "P2" applies.

A24.3. Technical Escorts. Furnish technical escorts when service regulations (or cargo clearance arrangements) require it, or when the shipping activity's medical or flight safety personnel dictate. The shipping activity must initiate action to furnish the qualified personnel, when they are required. They must also furnish technical escorts or other personnel to accompany shipments of infectious substances (etiologic agents) or plant quarantine materials per A10.8. When the shipping activity is required to furnish qualified personnel, it will also initiate action to furnish all required protective clothing and equipment for crew members, in addition to the appropriate decontamination detection and emergency first-aid equipment. The escort has complete jurisdiction over the cargo as it pertains to normal security, safety, protection of personnel, repair, and disposal of containers. However, in the following situations, escort authorities are primarily technical advisors, and are subordinate to:

A24.3.1. The aircraft commander in matters of flight operations and safety.

A24.3.2. The base installation commander in matters affecting the safety and mission of the command.

A24.4. Shipping Documents for Infectious Substances (Etiologic Agents). As indicated in A3.3.6.2.9, personnel must all ensure all necessary transfer documents required by the 42 CFR, 7 CFR, 9 CFR, and applicable biosurety regulations are appropriately signed and emplaced prior to transport of Infectious Substances. Both the shipper and the receiver must ensure advanced arrangements are made prior to transfer/transport of samples and that all necessary import/export permits are obtained prior to transport of infectious substances. An etiologic agent and plant quarantine material shipment record must accompany all shipments of infectious substances (etiologic agents) transported under the provisions of this attachment. The consignor (shipper) must prepare this record.

A24.4.1. If the shipping document is classified, it must be in the custody of the technical escort or other qualified personnel accompanying the shipment. In the absence of accompanying personnel, and if the document is not classified, the shipper will place the original and one copy in the outermost container of the number one package.

A24.4.2. On receipt at the receiving installation, make a record of the shipment's condition under "Remarks." Forward two copies of the completed form directly to the Commanding Officer, US Army, Fort Detrick, Frederick MD 21701-5000, Attn: (1) Transportation Officer, and (2) Liaison Officer (USPHS). This creates a permanent record file that is in compliance with agreements between DOD and the Department of Health and Human Services; and also between DOD and the Department of Agriculture.

A24.4.3. The agency receiving the shipment is responsible for forwarding the report indicated above within 2 hours of receipt.

A24.5. Aircrew Jettison Criteria. For cargo consisting of Class 6.1, PG I, hazard zone A toxic material; Class 2.3, hazard zone A toxic material; infectious substances; biological agents; or radioactive material (other than excepted quantities), the jettison criteria are as follows:

A24.5.1. Must not be jettisoned over land.

A24.5.2. May not be jettisoned over water unless the cargo, in addition to size criteria, weighs at least 1.6 g/cm^3 (100 lbs/ft^3) to ensure sinking. Also, the cargo must be jettisoned at least 19.3 kilometers (12 miles) offshore, and preferably beyond a shelf, in water 100 fathoms (600 feet) or more in depth. The aircraft commander is given a predeparture briefing on acceptable jettisoning locations based on the above criteria. When cargo is jettisoned to decrease weight, jettison all other cargo before hazardous cargo.

A24.5.3. When cargo is leaking and is beyond control of the escort to repair or neutralize, the escort must inform the aircraft commander. The decision of jettisoning will rest with the aircraft commander. In this instance, the commander may jettison the cargo over water without regard to weight or depth criteria.

A24.5.4. When the cargo weighs less than 1.6 g/cm^3 (100 lb./ft^3) or when size of cargo would not permit inflight jettisoning, model of aircraft selected for overwater missions must be based on two-engine performance from equal time point (ETP) to destination. Aircraft performance is based on aircraft remaining airborne when all cargo except the hazardous cargo is jettisoned.

Attachment 25

HAZARDOUS MATERIALS INITIAL AND REFRESHER TRAINING

A25.1. Training General Requirements. This attachment identifies the hazardous material training required by **paragraph 1.3**. Commanders assign hazardous material workers into one of four functional groups. Training requirements are based on functional group. This approach provides basic hazardous materials training applicable to all personnel at the first level. Trainers then provide more detailed training to supplement the basic level of training based on specific job responsibilities.

A25.2. Training for Noncertifying Officials. Train individuals according to the following general areas of responsibility. Unless otherwise required by Service/Agency directives, training may be performed locally. Develop training specific to the individual's hazardous material duties. The courses listed are suggested DOD courses that may be used to satisfy the applicable level of training. Telephone contact numbers are listed the first time the training location is identified. Commercial or other government sources may also be used for training other than Preparer level to the extent it satisfies the required level of training.

A25.2.1. Handlers. Trainers ensure training covers basic hazardous material familiarization, awareness, and communication requirements. This includes hazard classification, marking, labeling, placarding, documentation, compatibility, and safety (including emergency response information). Training will also include handling and job (function) specific requirements.

A25.2.1.1. HAZMAT Familiarization and Safety in Transportation, AMMO-67, Web Based Training, U.S. Army Defense Ammunition Center, McAlester OK 74501. Telephone DSN 956-8961 or commercial (918) 420-8961.

A25.2.1.2. Transportation of Hazardous Material for Supervisors, A822-0014, Navy Supply Corps School, Athens GA 30606. Telephone DSN 588-7207/7215 or commercial (706) 354- 7207/7215.

A25.2.1.3. Storage and Handling of Hazardous Materials (R511), DLA Training Center (DTC), Columbus, OH 43213-1430. Telephone DSN 850-5969 or commercial (614) 692-5969/ (800) 458-7903/ E-mail: **mailto:INFO@dtc.dla.mil**.

A25.2.1.4. Triennial Storage and Handling of Hazardous Material Recurrent (R611), DLA Center for Training, Education, and Development (DCTED), 380 Morrison Road, Columbus, OH 43213-1430. Telephone DSN 850-5986 or commercial (614) 692-5986/(800) 458-7903 / E-mail: **mailto:INFO@dpcso.dla.mil**.

A25.2.1.5. Hazardous Material Handler Refresher WBT, **https://amc.csd.disa.mil/kc/login/login.asp**, Expeditionary Center, Air Transportation Branch, USAF MOS/MOLT. Telephone DSN 650-7504.

A25.2.1.6. Department of Defense Hazardous Materials Packaging, Computer Based Training (CBT), Defense Distribution Center, DDC-J-3/J-4-TPR, 8000 Mission Drive, New Cumberland, PA. 17070. Telephone DSN 430-2923 or commercial (717) 605-2923, **http://www.dtc.dla.mil/HAZMAT/index.html**.

A25.2.2. Packers. Packers, who do not certify, must work closely with the preparer (certifier) and must not close (seal) the container until the preparer (certifier) has validated the packaging. Trainers ensure that packers are knowledgeable in all aspects of handler's requirements with additional emphasis in hazardous materials packaging requirements.

A25.2.2.1. DOD POP Program (R530 and R630-Refresher), Defense Distribution Center, DDC-J-3/J-4-0, 2001 Mission Drive, New Cumberland, PA 17070-5000. Telephone DSN 771-8238/8353 or commercial (717) 770-8238/8353. Web Available at: **https://dfdod.ddc.dla.mil/ddcpop/**

A25.2.3. Inspectors. In addition to handlers' requirements, trainers ensure that inspectors are knowledgeable in the use of commercial and military hazardous materials documents, and shipping papers. Inspectors will be familiar with appropriate packaging specifications.

A25.2.3.1. Hazardous Materials Airlift Inspector Course (LCAZP2T251 00AA- Initial (Resident) or L7AZT2T251 00AA – Initial (Mobile)), Fort Lee VA 23801-1529. Telephone DSN 539-1586/1761 or commercial (804) 765-1586/1761.

A25.3. Training for Certifying Officials. Preparers (certifying officials), as defined in **paragraph 1.2.4**, are authorized to accomplish the Shipper's Declaration for Dangerous Goods certification according to **paragraph 1.2.7**. Supervisors must consult DOD Catalog 5010.16-c *Defense Management Education and Training* to select the most appropriate course for the individual based on course prerequisites. Train preparers based on one of the following function specific requirements:

A25.3.1. Preparers. Personnel whose primary duty is preparing and certifying all types of hazardous materials shipments on a daily basis. The courses identified below are authorized only if developed and administered according to the most recent Interservice Training Review Organization Task Group on Hazardous Materials Training Memorandum of Understanding (MOU). The MOU is developed jointly with each school and Service/DLA policy focal point to ensure standard and adequate Preparer level training for DOD personnel. Any deviation from the MOU invalidates the course and is not authorized as acceptable training under this manual. These individuals must have satisfactorily completed one of the qualifying courses:

A25.3.1.1. Initial Training Courses. Personnel identified in A25.3.1. must satisfactorily complete one of the initial training courses identified below as a prerequisite to certifying the Shipper's Declaration for Dangerous Goods for airlift of hazardous cargo.

A25.3.1.1.1. Hazardous Material Preparer Course (LCAZP2T051 00AA, Initial (Resident) or L7AZT2T051 00AA, Initial (Mobile)), 345 TRS/TTTH, Fort Lee VA 23801-1529. Telephone DSN 539-1586/1761 or commercial (804) 765-1586/1761.

A25.3.1.1.2. Technical Transportation of Hazardous Materials (AMMO-62, Resident or AMMO-62OS On Site), U.S. Army Defense Ammunition Center and School, McAlester OK 76544. Telephone DSN 956-8398 or commercial (918) 420-8398.

A25.3.1.1.3. Transportation of Hazardous Material-Basic (A-822-0012), Navy Supply Corps School, 1378 Porter Ave., Naval Station Newport, Newport, RI 02841. Telephone DSN: 841-4820, Commercial: (401) 841-4820.

A25.3.1.2. Refresher Training Courses. Personnel, who have previously completed one of the courses specified in A25.3.1.1., must satisfy the 24-month refresher training requirement of A25.5. by completing one of the following courses:

A25.3.1.2.1. Hazardous Material Preparer Refresher (Exportable) (L6ARW2T051 00AA/Distance Learning), 345 TRS/TTTH, Fort Lee VA 23801-1529. Telephone DSN 539-1559/1560/1586/1761 or commercial (804) 765-1559/1560/1586/1761. E-mail: **usaf.lee.345-trs.mbx.hazmat-preparer@mail.mil**, for refresher training only. This course approved for Air Force, Army, DLA, DCMA, and Marine Corps activities only.

A25.3.1.2.2. General Transportation of Hazardous Materials (AMMO-37, Resident or AMMO-370S, On Site), U.S. Army Defense Ammunition Center, McAlester OK 76544. Telephone DSN 956-8398 or commercial (918) 420-8398.

A25.3.1.2.3. Transportation of Hazardous Material-Recertification (A-822-0011), Navy Supply Corps School, 1378 Porter Ave., Naval Station Newport, Newport, RI 02841. Telephone DSN: 841-4820, Commercial: (401) 841-4820.

A25.3.1.2.4. Hazardous Materials Inspector Refresher (Exportable) (L6ARW2T251 00AA), 345 TRS/TTTD, Fort Lee VA 23801-1529. Telephone DSN 539-1559/1560/1586/1761 or commercial (804) 765-1559/1560/1586/1761. E-mail: **usaf.lee.345-trs.mbx.hazmat-inspector@mail.mil**, for refresher training only.

A25.3.1.3. The following training is available for medical personnel (i.e., anyone involved with the transportation of pathogens or etiologic agents, except when mixed with explosives or substances in other hazard classes) who manage, package, certify, or prepare laboratory samples and specimens and regulated medical waste only, for transport by any mode.

A25.3.1.3.1. Transport of Biomedical Material Course (Initial or Refresher), U.S. Army Public Health Command, Aberdeen Proving Ground, MD 21010-5403. Telephone DSN 584-5228/3651 or commercial (410) 436-5228/3651.

A25.3.1.4. DOT Transportation Safety Institute (TSI) training. TSI is authorized to conduct DOD Hazmat certification training on an overflow basis when the recognized DOD Schools (Defense Travel Regulation (DTR) 4500.9-R, Part II, Chapter 204; or identified above) cannot provide training within the required timeframe. In this case, the requesting Service or Agency Training Manager/Coordinator must prepare the request to the DOD school and maintain a record of the request and reason for refusal.

A25.3.1.4.1. DOD Preparation of Hazardous Material for Transportation (Initial) (HM00204), Transportation Safety Institute, Oklahoma City, OK 73169-6900. Telephone (405) 954-4500; website: **http://www.tsi.dot.gov/tsims**.

A25.3.1.4.2. DOD Preparation of Hazardous Material for Transportation (Refresher) (HM00205), Transportation Safety Institute, Oklahoma City, OK 73169-6900. Telephone (405) 954-4500; website: **http://www.tsi.dot.gov/tsims**.

A25.3.2. Technical Specialist. Technical specialists may only sign the Shipper's Declaration for Dangerous Goods form as a certifying official on items they are technically qualified to maintain and prepare for shipment. A technical specialist will:

A25.3.2.1. Be designated in writing by the Commander to certify the unit or activity's hazardous materials upon completion of training that includes:

A25.3.2.1.1. Packaging and preparation. Training may be obtained by formal training/job skills or from an individual qualified by formal training/job skills to package/prepare hazardous materials specific to the unit or activity.

A25.3.2.1.2. Certification, marking, labeling, and all other aspects of this manual relevant to the hazardous materials specific to the unit or activity. Training must be conducted by an individual qualified as a Preparer according to A25.3.1.

A25.3.2.2. This authorization applies to mobility operations conducted according to DTR 4500.9-R, Part III. Technical specialists may provide necessary documentation required by A17.1.1.2 to transportation offices for non-mobility movement.

A25.3.2.3. Air Force activities use the "Hazardous Material Technical Specialist Instructional Guidance" training material to develop and administer a local technical specialist training program. Contact your MAJCOM transportation office for guidance, and the 401 SCMS/GUMA, (Distribution Flight) on the AF Portal page to obtain a copy of the material.

A25.4. Security Training. Each employee associated with the packaging and transportation of hazardous materials must receive security training in accordance with 49 CFR §172.704.

A25.5. Training Frequency. All hazardous material personnel must receive initial training and subsequent refresher training at 24-month intervals. This applies to all levels (i.e., Handlers, Packers, Inspectors, Technical Specialists, and Preparers) of required training. Train individuals based on functional group requirements.

A25.5.1. Each Service focal point or major command (MAJCOM) focal point may grant an extension to this qualification expiration date for a period not to exceed 60 calendar days during which eligible personnel must receive training.

A25.5.2. Each Service focal point or MAJCOM focal point may grant successive 60-day extensions to a person's qualification expiration date for long-term tactical or contingency operations. In this instance, personnel extended past their initial 60-day extension may only certify hazardous materials moved according to the tactical or contingency operation. Once personnel return to normal duty, train each person as specified in this attachment.

A25.5.3. Each Service focal point or MAJCOM focal point is responsible for management of the extension authority and may establish more stringent training frequencies to enhance training requirements.

A25.6. Training Records. Test all hazardous material personnel and maintain a record of the training provided. Maintain and dispose of records according to an approved Records Disposition Schedule. As a minimum, maintain the record for as long as the person works for the DOD as a hazardous material employee and for 90 days after separation from the DOD. This record must indicate the following:

A25.6.1. Name of person who received the training.

A25.6.2. Date training took place.

A25.6.3. A description, copy, or location of training materials used to train the person.

A25.6.4. The name and address of the person who provided the training.

A25.6.5. Certification statement of completion of training and testing.

A25.7. Certification Under Combat Conditions. An aircraft commander (or representative designated by the commander) may accept a hazardous materials shipment under a combat situation without regard to the above training.

A25.8. Non-DOD Personnel Certifying Hazardous Material Shipments. Non-DOD personnel preparing hazardous materials for transportation by military air must do so according to this manual. DOD does not require non-DOD personnel to complete the training courses specified in this attachment. However, these individuals must meet the requirements of Title 49 CFR Part 172 Subpart H *Training* (IATA, Dangerous Goods Regulations or ICAO, Technical Instructions training may also be used) for all employees having responsibility for preparing hazardous materials for shipment. Training must include function specific duties related to military air transportation. Non-DOD personnel who desire the training outlined in this attachment must contact their contract administration office.

Attachment 26

TABLE OF EQUIVALENTS AND NET QUANTITY OF GAS CONVERSION FORMULA

A26.1. Metrics. **Figure A26.1** provides a list of metric prefixes.

Figure A26.1. Metric Prefixes.

Deci	0.1	Deca	10
Centi	0.01	Hecto	100
Milli	0.001	Kilo	1,000
Micro	0.000001	Mega	1,000,000
Nano	0.000000001	Giga	1,000,000,000
Pico	0.000000000001	Tera	1,000,000,000,000

A26.2. Miscellaneous Conversions. **Figure A26.2** provides a list of general miscellaneous conversions for use with this manual.

Figure A26.2. Miscellaneous Conversions.

VOLUME		**WEIGHT**	
1 liter	0.264 gallon, 1.057 quarts, 61.025 cubic inches, 33.815 fluid ounces	1 gram 1 kilogram	0.03527 ounces, 0.0022 pounds avoirdupois 2.205 pounds,
1 cubic foot	28.32 liters, 7.481 gallons, 1728 cubic inches	1 pound	35.274 ounces 0.4536 kg
1 cubic meter	1000 liters, 35.31 cubic feet, 264.2 gallons	1 ounce	28.35 grams
1 milliliter	0.0338 oz	PRESSURE:	
1 gallon	3.785l	1 pound per square inch	6.895 kilopascal
1 oz	29.57 ml	1 kilopascal	0.145 psi
LENGTH		RADIOACTIVE	ACTIVITY
1 centimeter 1 meter	0.3937 inches 3.28 feet, 39.37 inches	1 TBq 1 Sv/hr	27 Ci 100 rem/hr
1 inch	2.54 cm, 25.4 mm	1 rem/hr	0.01 Sv/hr
1 foot	0.3048 m		
1 millimeter	0.03937 in		
VOLUME			
1 newton	101.97 gram force		

A26.3. Temperature Conversion. Use **Figure A26.3** to convert temperatures between Celsius and Fahrenheit.

Figure A26.3. Temperature Conversion Formula.

C = (F-32) times 5/9
F = (C times 9/5) + 32
K = C + 273.15
C = degrees Celsius
F = degrees Fahrenheit,
K = degrees Kelvin (absolute)

A26.4. Tank Volume. Use **Figure A26.4** to determine tank volume.

Figure A26.4. Tank Volume Formula.

Formula	$V = p\, r^2 h$
where:	V= Tank Volume
	p= 3.142
	r^2= radius of tank
	h= height of tank

A26.5. Net Quantity of Gas Conversion Formula. Use **Figure A26.5** to determine the net hazard of a compressed gas by converting PSI of a cylinder into pounds. Use **Figure A26.6** to determine the molecular weight or specific gravity required to complete the formula.

Figure A26.5. Net Quantity of Gas Conversion Formula.

Formula (1)	P= 0.00512 x A x B x C
	or
Formula (2)	P= .0001744 x A x B x M
where:	P= weight of gas in pounds
	A= pressure in pounds per square inch
	B= volume of cylinder in cubic feet
	C= specific gravity of the gas
	M= molecular weight of the gas molecule

NOTE: Use Formula (1) for calculation using the specific gravity value. Use Formula (2) for calculation using the molecular weight value.

A26.5.1. Example for Determining Net Quantity of Gas. The following information is known or determined by examination of the cylinder. Measure the cylinder's height from the external base to the valve seat. Measure the external diameter (width). Assume the cylinder does not cone at the top.

A26.5.1.1. Example 1. Tank measurements:

Height: 50 inches

Diameter: 9 inches

Radius: 4.5 inches

Tank contents: CO_2

Internal Pressure: 900 psi

Tank Volume = 1.841 Ft^3

P (pounds of gas) = 0.00512 x A x B x C = {0.00512 in^2/Ft^3} x {900 psi} x {1.841 Ft^3} x {1.516}

Answer: *P = 12.9 pounds*

A26.5.1.2. Example 2. Tank measurements:

Height: 40 inches

Diameter: 12 inches

Radius = 6 inches

Tank contents: C_2H_2

Internal Pressure: 500 psi

Tank Volume = 2.618 Ft^3

P (pounds of gas) = 0.00512 x A x B x C = {0.00512 in^2/Ft^3} x {500 psi} x {2.618 Ft^3} x {0.897}

Answer: *P = 6.01 pounds*

A26.5.1.3. Example 3. Tank measurements:

Height: 50 inches

Diameter: 9 inches

Radius = 4.5 inches

Tank contents: CO_2

Internal Pressure: 900 psi

Tank Volume = 1.841 Ft^3

P = 0.0001744 x A x B x M = 0.0001744 x (900 psi) x (1.841 Ft^3) x (44.00)

Answer: *P = 12.7 pounds*

A26.5.1.4. Example 4. Tank measurements:

Height: 40 inches

Diameter: 12 inches

Radius = 6 inches

Tank contents: C_2H_2

Internal Pressure: 500 psi

Tank Volume = 2.618 Ft^3

P = 0.0001744 x A x B x C = 0.0001744 x (500 psi) x (2.618 Ft^3) x (26.00)

Answer: *P = 5.94 pounds*

A26.5.2. Examples for Determining Radioactive Shipments. A_1/A_2 values represent the maximum activity that can be shipped in a Type A package. A_1 is for Special form material and A_2 values is for Normal or Other form material. In dealing with mixtures of radionuclides if the sum of the ratios is $\leq$1, then use a Type A package. If the sum of the ratios is >1, then use a Type B package.

A26.5.2.1. Example 1. Determine the most appropriate packaging when shipping a mixture of 0.46 TBq of Bromine-77 (Br-77) & 0.25 TBq of Cerium-143 (Ce-143).

Activity you have / Activity allowed = sum of the ratio

0.46 TBq/3 TBq = 0.15 (A_2 for Br-77)

0.25 TBq/0.6 TBq = 0.42 (A_2 for Ce-143)

0.15 + 0.42 = 0.57 Total sum of the ratios 0.57 $\leq$ 1, so a Type A package is required

A26.5.2.2. Example 2. Determine if the item can be shipped as a RQ of a hazardous substance.

Shipping a mixture of 2.02 TBq of Silver-112 (Ag-112), 0.16 TBq of Tin-113 (Sn-113) & 0.21 TBq of Tungsten-185 (W-185).

Activity you have / Reportable Quantity = RQ

2.02 TBq/3.7 TBq = 0.546 (RQ for Ag-112)

0.16 TBq/0.37 TBq = 0.432 (RQ for Sn-113)

0.21 TBq/0.37 TBq = 0.568 (RQ for W-185)

Total RQ of 1.576 > 1 Therefore, mixture would be regulated as a hazardous substance.

A26.5.2.3. Example 3. Determine the most appropriate packaging when shipping the following:

1.45 TBq of Terbium-160 (Tb-160)

A_2 value for Tb-160 is 0. 6 TBq.

1.45 TBq > 0.6 TBq Since the amount you are shipping is greater than the A_2 value; a Type B package is required.

A26.5.2.4. Example 4. Determine the most appropriate packaging when shipping the following:

0.45 GBq of solid Niobium (Nb-95) internationally

0.45 GBq converted is 0.00045 TBq

A_2 value for Nb-95 = 1 TBq

$10^{-3}A_2$ = 0.001 TBq > 0.00045 TBq

A26.5.2.4.1. Since the maximum activity allowed is greater than amount being shipped, the item can be shipped in an Excepted package.

A26.6. Properties of Common Gases. **Figure A26.6** is a list of the molecular weight and specific gravity of common gases.

Figure A26.6. Properties of Common Gases.

GAS	SYMBOL	MOLECULAR WEIGHT	SPECIFIC GRAVITY
Helium	He	4.00	0.138
Argon	A	40.00	1.377
Air	-	29.00	1.000
Oxygen	O_2	32.00	1.103
Nitrogen	N_2	28.00	0.966
Hydrogen	H_2	2.00	0.0695
Nitric Oxide	NO	30.00	1.034
Carbon Monoxide	CO	28.00	0.965
Hydrochloric Acid	HCl	36.50	1.256
Steam	H_2O	18.00	0.623
Carbon Dioxide	CO_2	44.00	1.516
Nitrous Oxide	N_2O	44.00	1.518
Sulfur Dioxide	SO_2	64.00	2.208
Ammonia	NH_3	17.00	0.587
Acetylene	C_2H_2	26.00	0.897
Methyl Chloride	CH_2Cl	50.50	1.738
Methane	Ch_4	16.00	0.553
Ethylene	$C2H_4$	28.00	0.967

A26.7. Lithium Content. Rechargeable lithium batteries are manufactured without lithium metals. There are two methods to determine equivalent lithium content.

A26.7.1. The rated capacity, in ampere-hours, of each cell times 0.3 expressed in grams (g). Example: A battery with 9 cells each having a rated capacity of 2.2 ampere-hours contains 5.94 grams of equivalent lithium content (2.2 X 0.3 X 9 = 5.94g)

A26.7.2. Dividing the stated volts (V) on a battery pack by 3.7 (rounded to nearest whole number), multiplying the results by the stated ampere-hours (Ah) times 0.3. Example: Battery marked with 14.8 (V) and 4.8 (Ah) contains 5.76 grams of equivalent lithium content (14.8 divided by 3.7 = 4, 4 X 4.8 = 19.2, 19.2 X 0.3 = 5.76 grams)

Attachment 27

PREPARING EXPLOSIVES PACKAGED PRIOR TO 1 JANUARY 1990

A27.1. General Requirements. Use this attachment to verify existing packaging which is exempt from UN specification packaging requirements according to **paragraph A3.3.1.10**. The methods of packaging described in this attachment were authorized by 49 CFR and in effect on 31 December 1989.

A27.1.1. See **Attachment 17** for certification requirements.

A27.1.2. Use Proper Shipping Names identified in **Table A4.1** in place of DOT names described in this attachment.

A27.1.3. See **Attachment 5** for special and general handling instructions.

A27.1.4. Comply with **Attachment 24** for ammunition or explosives which are packed in freon for safety during movement or which contain toxic substances previously described as a "Class A Poison."

A27.1.5. Unstable, condemned, or deteriorated explosives will not be shipped by military air. Unserviceable explosives may be shipped if otherwise safe for transportation.

A27.1.6. See **Attachment 14** and **Attachment 15** for marking and labeling requirements.

A27.1.7. Shipping Papers (e.g., manifest) and Shipper's Declaration For Dangerous Goods (Key 19) must be annotated, "Government owned goods packaged prior to 1 January 1990."

A27.1.8. Damaged or unserviceable packaging will not be shipped by military air. Repackage explosives according to current guidance in **Attachment 5**.

A27.1.9. See **Table A27.1** for an explosive or ammunition cross reference. In this table, column 1 contains a list of explosive/ammunition with column 2 giving the paragraph from AFR 71-4 and column 3 identifying the paragraph for that item in this manual.

A27.1.10. Use DOT/Military specification containers specified in this attachment, when applicable. Use UN Specification packaging specified in **Attachment 5** when repackaging is required. See **Table A27.2** for DOT/Military specification container cross reference.

Table A27.1. Explosive/Ammunition Cross Reference.

Name of Explosive or Ammunition	AFR 71-4 Paragraph	AFMAN 24-204_IP Paragraph
Actuating Cartridges, Explosive, Fire Extinguisher or Actuating Cartridge, Explosive, Valve	5-32	A27.16.
Ammunition for Cannon (with Empty Projectiles; with Inert Loaded Projectiles; with Solid Projectile; without Projectiles; with Tear Gas Projectiles, Class B Explosives; with Explosives Projectiles; with Gas Projectiles; with Illumination Projectiles; with Incendiary Projectiles; with Smoke Projectiles and with Tear Gas Projectiles, Class A Explosives	5-10	A27.2.

Name of Explosive or Ammunition	AFR 71-4 Paragraph	AFMAN 24-204_IP Paragraph
Ammunition for Small Arms with Incendiary Projectiles and Ammunition for Small Arms with Explosives Projectiles	5-11	A27.3.
Black Powder and Low Explosives	5-13	A27.4.
Blasting Agent N.O.S.	5-63	A27.31.
Cartridge, Practice Ammunition	5-62	A27.30.
Common Fireworks, Signal Flares, Hand Signal Devices, Smoke Signals, Smoke Candles, Smoke Grenades, Smoke Pots, and Very Signal Cartridges	5-23	A27.9.
Cord, Detonating; Fuse, Mild Detonating, Metal Clad; and Flexible Linear Shaped Charges, Metal Clad	5-25	A27.10.
Detonating, Fuzes, Class C Explosives	5-27	A27.11.
Detonating Fuzes, Class A Explosives; Booster, Explosive; Burster, Explosive and Supplementary Charges, Explosive	5-17	A27.6.
Detonating Primers, Class A Explosives and Detonating Primers, Class C Explosives	5-28	A27.12.
Detonators, Class A Explosives and Detonators, Class C Explosives	5-14	A27.5.
Explosive Bomb; Explosive Mine; Explosive Projectile; Explosive Torpedo; Grenade, Hand, Explosive; and Grenade, Rifle, Explosive	5-29	A27.13.
Explosive Cable Cutters; Explosive Power Device, Class C; Explosive Release Device, or Starter Cartridges, Jet Engine, Class C Explosive	5-30	A27.14.
Explosive Power Device, Class B	5-56	A27.28.
Explosive Rivets	5-31	A27.15.
Fuze, Combination; Fuze, Percussion; Fuze, Time; Fuze, Tracer; or Tracer	5-22	A27.8.
Grenade, Tear Gas Irritating Material	10-37	A27.34.
High Explosives	5-34	A27.18.
High Explosives, Liquids	5-35	A27.18.1.
High Explosives With Liquid Explosive Ingredients	5-36	A27.18.2.
High Explosives With No Liquid Explosive Ingredient and Propellant Explosives, Class A	5-37	A27.18.3.
High Explosives With No Liquid Explosive Ingredient Nor Any Chlorate	5-38	A27.18.4. – A27.18.12.
Igniter Cord	5-39	A27.19.
Initiating Explosive (Diazodinitrophenol or Lead Monoitroresorcinate)	5-40	A27.20.1.

Name of Explosive or Ammunition	AFR 71-4 Paragraph	AFMAN 24-204_IP Paragraph
Initiating Explosive (Guanyl Nitrosomino Guanylidene Hydrazine)	5-41	A27.20.2.
Initiating Explosive (Lead Azide Dextrinated Type Only)	5-42	A27.20.3.
Initiating Explosive (Lead Styphnate (Lead Trinitrosorcinate) or Barium Styphnate, Monohydrate)	5-43	A27.20.4.
Initiating Explosive (Nitro Mannite)	5-44	A27.20.5.
Initiating Explosive (Nitrosoguanadine)	5-45	A27.20.6.
Initiating Explosive (Pentaerythrite Tetranitrate)	5-46	A27.20.7.
Initiating Explosive (Tetrazene)	5-47	A27.20.8.
Initiating Explosive (Fulminate of Mercury)	5-48	A27.20.9.
Oil Well Cartridges	5-64	A27.32.
Propellant Explosives, Solid or Liquid (Class A or B Explosives)	5-51	A27.24.
Railway Torpedoes	5-33.a.(6)	A27.23.
Rocket Ammunition with (Inert Loaded Projectiles, Solid Projectiles, Empty Projectiles, Explosive Projectiles, Gas Projectiles, Smoke Projectiles, Incendiary Projectiles, or Illuminating Projectiles)	5-52	A27.25.
Rocket Engine (Liquid), Class B Explosives	5-61	A27.29.
Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors, Igniters, Rocket Motors; Igniters, Jet Thrust; Igniters, Ramjet Engine (Class B explosives) or Starter Cartridge, Jet Engine	5-50	A27.22.
Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors; or Igniters, Jet Thrust (Class A Explosives)	5-49	A27.21.
Small Arms Ammunition and Small arms Ammunition, Tear Gas Cartridges	5-53	A27.26.
Small Arms Primer; Cannon Primer; Combination Primer; Percussion Cap; Grenades Empty, Primed	5-18	A27.7.
Special Fireworks	5-33	A27.17.
Toy Caps	5-54	A27.27.
Delay Electric Igniter; Electric Squib; Empty Cartridge Bag with Black Powder Igniter; Fuse Igniter; Fuse Lighter; Igniter Fuse, Metal Clad; Igniter; Safety Squib	5-19	A27.33.

A27.2. Ammunition for Cannon (with Empty Projectiles; with Inert Loaded Projectiles; with Solid Projectile; without Projectiles; with Tear Gas Projectiles, Class B Explosives; with Explosives Projectiles; with Gas Projectiles; with Illumination Projectiles; with Incendiary Projectiles; with Smoke Projectiles and with Tear Gas Projectiles, Class A Explosives. Package

in strong wooden or metal containers, or plastic containers approved by military specifications or drawings.

A27.3. Ammunition for Small Arms with Incendiary Projectiles and Ammunition for Small Arms with Explosives Projectiles. Package in strong wooden or metal containers approved by military specifications or drawings not to exceed 175 pounds gross weight.

A27.4. Black Powder and Low Explosives.

A27.4.1. Metal kegs, DOT 1, not less than 7 inches long. Net weight not less than 6 ¼ pounds and no more than 150 pounds.

A27.4.2. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside fiber or metal containers, not over 1 ¾ pound capacity each, or cotton bags at least 4-ounce cotton duck not over 25-pounds capacity each. The maximum gross weight must be 140 pounds for DOT 14 and 200 pounds for DOT 15A, 16A, or 19B wooden boxes.

A27.4.3. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside cylindrical fiber cartridge not over 5 inches in diameter nor over 18 inches long, with fiber at least 0.05 inch thick paraffined on outer surface, with joints securely glued or cemented, or strong paraffined paper cartridges not over 12 inches long authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Boxes must be completely lined with strong paraffined paper, or other suitable waterproofed material, without joints or other openings at the bottom or sides. Authorized gross weight must not be over 75 pounds.

A27.4.4. Fiberboard boxes, DOT 12H, 23F, or 23H, with inside cylindrical fiber cartridges not over 5 inches in diameter nor over 18 inches long, with fiber at least 0.05 inch thick paraffined on outer surface with joints securely glued or cemented, or strong paraffined paper cartridges not over 12 inches long authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Authorized gross weight must not be over 65 pounds.

A27.4.5. Black Powder (not low explosive), in addition to containers specified above, may be shipped in the following specification containers:

A27.4.5.1. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside cloth or paper bags not over 25 pounds net weight. The completed shipping package must be capable of withstanding a drop of 4 feet without rupture of inner or outer containers. The completed package must not contain more than 50 pounds net weight of black powder.

A27.4.5.2. Fiberboard boxes, DOT 12H, 23F, or 23H with inside cloth, paper, or securely closed polyethylene bags constructed of material not less than 0.004 inch thick. The maximum net weight must not exceed 25 pounds for cloth or paper bags and 50 pounds for polyethylene bags. Inside fiber or metal containers not over 1 pound net capacity each may be used, provided the completed shipping package is capable of withstanding a drop of 4 feet without rupture of the inner or outer containers. The tubes of the box may be eliminated and a single tube as specified in DOT 23F may be substituted. The completed package must not contain more than 50 pounds net weight of black powder.

A27.4.6. Black pellet powder, primed with the electric squib, secured inside the coaxial hole of the pellet powder (with loose ends of the wire of the squib effectively short-circuited) may

be shipped in wooden boxes, DOT 14, 15A, 16A, or 19B with inside strong paraffined paper cartridges not over 12 inches long, and authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Boxes must be lined as prescribed for cylindrical fiber cartridges. Gross weight must not be over 65 pounds.

A27.4.7. Low explosives (not black powder), in addition to the containers specified, may be shipped in the following specification containers:

A27.4.7.1. Wooden boxes, DOT 14, 15A, 16A, or 19B with strong paper bags not over 25 pounds capacity. Gross weight of DOT 15A or 16A boxes must not be over 200 pounds. Gross weight of DOT 14 box must not be over 140 pounds.

A27.4.7.2. Fiberboard boxes. DOT 12H, 23F, 23H, with inside strong paper bags not over 25 pounds capacity. Gross weight must not be over 65 pounds.

A27.4.7.3. Wooden boxes, DOT 15A or 19B, lined with paper, DOT 2L. Authorized for rods or cylinders not less than five-eighths of an inch in diameter.

A27.5. Detonators, Class A Explosives and Detonators, Class C Explosives. Detonators must fit snugly in strong inside packaging and must be snugly overpacked in outer packagings as specified in A27.5.7. and A27.5.8. below.

A27.5.1. For devices containing no more than 10 grams of explosives (excluding ignition and delay charges):

A27.5.1.1. No more than 50 devices may be packed in one inside packaging and no more than 500 devices may be packed in one outer packaging.

A27.5.1.2. The gross weight of the completed package must not be over 150 pounds or the gross weight permitted by the specification for the outer packaging used, whichever is less.

A27.5.2. For detonators that are blasting caps (including percussion activated) or delay connectors in metal tubes, the packaging must be as specified below. Also:

A27.5.3. Open ends of any device must be covered with an appropriate cushioning material.

A27.5.3.1. Inside packaging must fit snugly in intermediate packagings consisting of cartons or wrappings made of paper, plastic, or pasteboard.

A27.5.3.2. Intermediate packagings must be separated from the outer packaging by at least 1 inch of cushioning material.

A27.5.4. For devices containing no more than 3 grams of explosives (excluding ignition and delay charges):

A27.5.4.1. No more than 110 devices may be packed in one inside packaging; and,

A27.5.4.2. No more than 5,000 devices may be packed in one outer packaging.

A27.5.5. Detonators that are electric blasting caps, delay connectors in plastic sheaths, or blasting caps with empty plastic tubing containing no more than 3 grams of explosives (excluding ignition and delay charges) must be packed with no more than 100 devices in one inside receptacle and no more than 1,000 devices in one outer container.

A27.5.6. Detonators that are blasting caps with safety fuse, blasting caps with metal clad mild detonating cord, blasting caps with detonating cord, or blasting caps with shock tubes are not required to be attached to the safety fuse, metal clad mild detonating cord, detonating cord, or shock tube, and inside packagings are not required if the packagings configuration restricts freedom of movement of the caps and protects them from impact forces. Quantity limitations do not apply to Detonators, Class C Explosives. Container weight limitations do apply.

A27.5.7. Wooden boxes DOT 14, 15A, 16A, or 19B.

A27.5.8. Fiberboard boxes DOT 12H, 23F, or 23H.

A27.6. Detonating Fuzes, Class A Explosives; Booster, Explosive; Burster, Explosive and Supplementary Charges, Explosive. Package in well secured strong tight wooden or metal boxes approved by military specifications or drawings.

A27.6.1. The gross weight of an outer package containing detonating fuzes, Class A, must not exceed 190 pounds.

A27.6.2. Boosters, bursters, and supplementary charges, without detonators, when shipped separately, must not exceed 300 pounds gross weight.

A27.6.3. A fuze with any radioactive component must also meet requirements of **Attachment 11**.

A27.7. Small Arms Primer; Cannon Primer; Combination Primer; Percussion Cap; Grenades Empty, Primed.

A27.7.1. Package primers (cannon, combination, and small arms), percussion caps, and empty grenades, primed, in strong, tight outside wooden boxes with special provisions for securing the individual packages against movement within the exterior containers.

A27.7.2. Package empty cartridge cases, primed, in strong, tight outside wooden or fiberboard boxes or in DOT21C fiber drums. Each drum must be constructed to the specification requirements for a drum containing at least 250 pounds net weight. Each drum having a metal top or bottom must have a protective corrugated paperboard pad inserted between the contents and the metal.

A27.7.3. Small arms primers containing anvils must be packed in:

A27.7.3.1. Cellular Inside Packages. Packages with partitions separating the layers and columns of the primers so that the explosion of a portion of the primers in the completed shipping packages do not cause the explosion of all primers. They also must be packed in outer packagings as stated in A27.7.1. or in fiberboard boxes, DOT 12B, equipped with a corrugated fiberboard liner. The bursting test of the liner must be equal to or over that of the box. The exception is that a liner is not required for a full telescopic style box that may be closed with pressure sensitive tape as specified for DOT 12B. Not more than 5,000 primers may be packed in one outside fiberboard box.

A27.7.3.2. Fiberboard boxes, DOT 23H. Each box must be full depth telescopic style, with top section having extended end flaps and bottom section having extended side flaps, set up without glued or stapled joints. The full height inside perimeter liner, top and bottom pads must be made of doublewall corrugated fiberboard. Hand-holes not more

than 4 inches by 1 inch, horizontal with top score line are authorized in the ends of boxes. Package primers in cellular inside packages with partitions separating the layers and columns to form a tight fitting pack in the outer packagings. Do not pack more than 50,000 primers in one outside box.

A27.7.4. Small arms primers and percussion caps may be packed with nonexplosive and nonflammable articles, or with small arms ammunition as provided in A27.27. Small arms primers may be included with propellant explosive (solid), class B, in the same outer packagings as provided in A27.24.2. The weight of the small arms primers or percussion caps must not exceed 5 pounds per shipping container. Percussion caps must be packaged in metal or other inside boxes. Do not pack more than 500 caps in inside boxes. The construction of the cap or packaging, and the kind and quantity of explosives in each, is such that the explosion of a part of the caps in the completed package does not cause the explosion of all the caps. Package percussion caps in fiberboard boxes, DOT 12B, also:

A27.7.4.1. Do not pack more than 100 caps each in inside metal cans. Not more than 10 metal cans each must then be overpacked in a chipboard box. Pack no more than five chipboard boxes in the 12B fiberboard box. The completed package must be such that an explosion of a part of the caps will not cause the explosion of all the caps.

A27.7.4.2. Pack no more than 100 caps each in inside plastic cans. The plastic cans must then be packed in a chipboard box with not more than eight such chipboard boxes tightly packed in the DOT 12B fiberboard box. The completed package must be such that an explosion of part of the caps will not cause the explosion of all of the caps. The gross weight of one outside package must not be more than 150 pounds.

A27.8. Fuze, Combination; Fuze, Percussion; Fuze, Time; Fuze, Tracer; or Tracer. Package in strong, tight, outside wooden boxes, triple-wall fiberboard boxes, or DOT 23F fiberboard boxes. Special provisions must be made for securing individual packages of fuzes or tracers against movement in the box. The gross weight of each wooden or fiberboard box must not be more than 150 pounds. The gross weight of each DOT 23F fiberboard box must not be over 65 pounds.

A27.9. Common Fireworks, Signal Flares, Hand Signal Devices, Smoke Signals, Smoke Candles, Smoke Grenades, Smoke Pots, and Very Signal Cartridges must be packaged as follows:

A27.9.1. Wooden boxes, DOT 15A, 16A, 19A, or 19B. The gross weight must not be over 100 pounds, however, a gross weight of 500 pounds is authorized for wooden boxes with very signal cartridges only.

A27.9.2. Fiberboard boxes, DOT 12B. The gross weight of fiberboard boxes must not be over 65 pounds.

A27.9.3. Watertight, aluminum drums, 8 inches in diameter, having a rubber gasket and a positive closure. These are authorized only for smoke pots.

A27.9.4. Smoke signals may be packed two each in a Navy-designated preformed polystyrene container banded with pressure-sensitive tape. Pallet loads must have a 2-foot high, ¼-inch plywood border around the lower portion of the load. Each polystyrene case may be overwrapped in a heat-sealed polystyrene bag. The minimum thickness of the bag must be 0.006 inch. Eighteen such containers may be consolidated in a MIL-B-43096, type

II, class 2, wirebound wooden box. Each face of the box must be lined with PPP-F-320, type W6C or equal fiberboard.

A27.9.5. Fireworks, such as sparklers, with match tip or head, or similar igniting point or surface, must have each individual tip, head, or similar ignition point or surface entirely covered and securely protected against accidental contact or friction. Except as otherwise specified above, the gross weight of one outside package containing common fireworks must not be over 100 pounds.

A27.10. Cord, Detonating; Fuse, Mild Detonating, Metal Clad; and Flexible Linear Shaped Charges, Metal Clad. Package in wooden or fiberboard boxes or shipping containers approved by military specification or drawings.

A27.11. Detonating, Fuzes, Class C Explosives. Packaging requirements:

A27.11.1. Package in fiberboard boxes, DOT 12H, with or without liners, with well-secured inside paperboard cartons. Suitable filler or lining materials must be used to prevent movement in the box.

A27.11.2. In well-secured, strong, tight outside wooden or metal boxes approved by military specification or drawing. The gross weight of the outside wooden or metal box must not be over 190 pounds.

A27.12. Detonating Primers, Class A Explosives and Detonating Primers, Class C Explosives. Packaging requirements:

A27.12.1. Wooden boxes, DOT 14, 15A, 16A, or 19B, or fiberboard boxes DOT 12H, 23F, or 23H.

A27.12.2. Shipping containers approved by military specification or drawing.

A27.13. Explosive Bomb; Explosive Mine; Explosive Projectile; Explosive Torpedo; Grenade, Hand, Explosive; and Grenade, Rifle, Explosive. Packaging requirements:

A27.13.1. Pack and secure explosive bombs, mines, projectiles, torpedoes, or grenades in strong wooden or metal boxes, except as provided in (2) below.

A27.13.2. Explosive bombs, mines, projectiles, torpedoes, over 90 pounds in weight, and explosive projectiles of not less than 4 ¾ inches in diameter, may be shipped unboxed if securely fastened to pallets or securely blocked and braced.

A27.13.3. Pack and secure bombs, grenades, or projectiles containing gas, smoke, or incendiary charges and bursting charges in strong wooden or metal boxes.

A27.13.3.1. The gross weight of a box containing more than one grenade or mine must not be over 250 pounds.

A27.13.3.2. The gross weight of a shipping container with more than one explosive bomb, warhead, or projectile must not be over 1,400 pounds.

A27.13.4. Package XM47, XM42, XM42E1, and SX54 mine-dispensing subsystem and XM2,XM12, XM12E1, XM12E2/E3, and XM17 canisters in wooden or metal containers. The following special shipping procedures apply:

A27.13.4.1. Wooden containers must not be stacked more than three high with a minimum of 3 feet of space above the top containers. Containers must be positioned in aircraft to allow a minimum of 2 feet of space in front of the container inspection door. Tiedown of containers must be such that access to inspection door is not denied (nets are not considered an obstruction); and

A27.13.4.2. Gross weight of wooden container must not be over 675 pounds.

A27.13.5. BLU 50/B bomblets are packaged in specially designed fiberboard lined plywood boxes. Inside containers consist of ten each bomblets in snug fitting, preformed polyurethane cushioning in a heat-sealed barrier bag.

A27.13.6. Explosive mines may be packaged in metal drums, PA 16, with 14 inside can assemblies with perforated tops, a preformed packing and two base assemblies. Drums must be filled with liquid freon. Two liquid level sight gauges must be located in the top half of the drum for visual monitoring of the liquid level.

A27.13.7. Explosive mines may be packaged in metal drums, PA 17, with inside preformed packing designed to hold mines below liquid freon level. Drums must be filled with liquid freon. Two liquid level sight gauges must be located in the top half of the drums for visual monitoring of the liquid level.

A27.13.8. Package CDU-4/B (SM41E1), CDE-5/B (XM40ES), CDU-10 (XM40ES/SM44) and CDU-14/B (XM64) in wooden boxes approved by military specification or drawing. CDUs must be filled with liquid freon and level electrically monitored.

A27.13.9. Explosive bomb, further described as 7.2 inch projector charge, may be shipped assembled to a 40-by 48 inch steel pallet having a gross weight of approximately 2,000 pounds.

A27.13.10. Package explosive bombs, CBU-55/B, containing explosive components and fuel (ethylene oxide) in a CNU-120/E container.

A27.13.11. Package explosive bombs, CBU-55/B, without fuel, in a CNU-120/E container.

A27.13.12. Explosive bombs, CBU-33/A, may be packed in plastic containers CNU-104/E conforming to MIL-P-22748A, class A, grade 6. Loaded containers must not be over 1,200 pounds gross weight.

A27.14. Explosive Cable Cutters; Explosive Power Device, Class C; Explosive Release Device, or Starter Cartridges, Jet Engine, Class C Explosive. Packaging Requirements:

A27.14.1. Fiberboard boxes, DOT 12H, 23F, or 23H. The maximum gross weight must not be over 65 pounds.

A27.14.2. Wooden or metal boxes must be approved by military specification or drawings. Starter cartridges, jet engine, must have igniter wires short-circuited when packed for shipment.

A27.15. Explosive Rivets. Package explosive rivets, containing not more than 375 milligrams of explosive composition each, in unit containers or paperboard. Pack the unit containers or paperboard in strong wooden, fiberboard or metal containers approved by military specification or drawings.

A27.16. Actuating Cartridges, Explosive, Fire Extinguisher or Actuating Cartridge, Explosive, Valve. Package in strong wooden or fiberboard boxes.

A27.17. Special Fireworks. Packaging Requirements:

A27.17.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. The maximum gross weight must not be over 500 pounds.

A27.17.2. Fiberboard boxes, DOT 12B. The maximum gross weight must not be over 65 pounds. Illuminating projectiles and airplane flares are not permitted in DOT 12B boxes.

A27.17.3. Package flash or spreader cartridges with not more than 72 grains of flash powder in inside fiberboard cartons or tin cans containing not over six cartridges. Pack no more than 150 inside containers in outside DOT 15A, 16A, 19A, or 19B wooden boxes or DOT 12B fiberboard boxes.

A27.17.4. Package assembled flash cartridge consisting of a paper cartridge shell, small arms primer, and flash composition in inside cartons. The flash composition in the one-piece assembled and ready for firing flash cartridge must not be over 180 grains. Do not pack more than 12 cartridges each in the inside cartons. A maximum of 12 inside cartons may be packed in DOT 15A, 15B, 16A, 19A, or 19B wooden boxes or DOT 12B fiberboard boxes. Flash cartridges, in quantities not over 5 pounds, packaged in small interior wooden boxes, may be packed with nonexplosive, nonflammable, and noncorrosive items.

A27.17.5. Unit pack no more than six flash sheets in an inside container. Intermediate pack no more than 12 unit packages in a pasteboard box or carton and packed in a DOT 15A, 16A, 19A, or 19B wooden box or DOT 12B fiberboard box. The gross weight of wooden boxes must not be over 150 pounds. The gross weight of fiberboard boxes must not be over 65 pounds.

A27.17.6. Package photographic flash powder in specification containers as specified in A27.17.3., except the inside container must be strong enough to hold up to 2 ounces each of contents. If bottles are used, each bottle must be packed in a securely closed fiber mailing tube with metal ends. Not more than forty eight 2-ounce bottles may be packed in an exterior wooden box. When packed in units not over 1-ounce each without bottles in similar fiber mailing tubes and exterior wooden boxes, the gross weight of each exterior box must not be over 150 pounds. The gross weight of exterior fiberboard boxes must not be over 65 pounds.

A27.17.7. Package toy torpedoes in wooden boxes, DOT 15A, 15B, 16A, 19A, 19B, or fiberboard boxes DOT 12B containers. Not more than 20 one-quarter gross cartons totaling not more than five gross of toy torpedoes are authorized per fiberboard box. The gross weight of a fiberboard box must not be over 35 pounds. The gross weight of a wooden box must not be over 65 pounds.

A27.17.7.1. Do not pack toy torpedoes of any kind with other fireworks.

A27.17.7.2. Pack toy torpedoes containing a cap in sawdust in inside paper or cardboard cartons. The size of the carton must not be less than 4 cubic inches for each grain of explosive.

A27.17.7.3. Pack toy torpedoes containing a mixture of potassium chlorate, black antimony, and sulfur, in an inner container containing not more than 36 torpedoes. The capacity of this inner container must be at least 105 cubic inches, and it must be divided

into 12 equal compartments. All vacant space inside the container must be filled with sawdust or fine shavings.

A27.17.8. Ship distress signals may be packed in outside DOT 12 fiberboard boxes provided:

A27.17.8.1. They are packed in inside metal containers. These containers must be made from at least 24 gauge sheet iron or other metal of equal strength.

A27.17.8.2. The inner container is closed by positive means (not friction).

A27.17.8.3. Inside containers completely fill the outer packaging.

A27.17.8.4. The gross weight is not over 95 pounds.

A27.17.9. Marine location markers (eight each) and aircraft flares (two each) may be packed two each in a Navy-designed, preformed polystyrene container banded with pressure-sensitive tape. Pallet loads must have 2-feet high, ¼-inch plywood border around the lower portion of the load. Polystyrene case may be overwrapped in heat sealed polyethylene bag .006 inch thickness minimum. Consolidate 18 such containers in a wirebound wood box MIL-B-43096, type II, class 2, lined top, bottom and sides with fiberboard, PPP-F-320, grade W6c or equal.

A27.17.10. Illuminating projectiles, incendiary projectiles, and smoke projectiles over 90 pounds in weight each, or of not less than 4 ¾ inches in diameter, may be palletized. Securely block and brace the palletized load according to methods prescribed by the responsible military department. A shipment container is not required.

A27.17.11. Illuminating projectiles, incendiary projectiles, and smoke projectiles less than 4 ¾ inches in diameter may be shipped without being boxed, when palletized and securely blocked and braced with methods prescribed by the responsible military department.

A27.17.12. MK27 Mod O guided missile flares or MK28-3 target flares may be packed in MK2 Mod O metal boxes.

A27.17.13. Practice or exercise warheads containing polytechnics may be shipped two each in a metal box (MK34, Mod O) with a gross weight over 65 pounds.

A27.17.14. Flares may be packed in flame-retardant polystyrene cases. The polystyrene cases must be shipped palletized, covered with plywood or wirebound sheathing secured with steel strapping.

A27.18. High Explosives.

A27.18.1. High explosives, consisting of a liquid mixed with an absorbent material, must have the absorbent (wood pulp or similar material) in sufficient quantity and be of satisfactory quality, and properly dried at the time of mixing. Nitrate of soda must be dried at the time of mixing to less than 1 percent of moisture; and the ingredients must be uniformly mixed so that the liquid will remain thoroughly absorbed under the most unfavorable atmospheric conditions incident to transportation.

A27.18.2. High explosives containing nitroglycerin or other liquid explosive ingredients must be uniformly mixed with an absorbent material and a satisfactory antacid. The antacid

must be in sufficient quantity to have the neutralizing power of an amount of magnesium carbonate equal to 1 percent of the nitroglycerin or other liquid explosive ingredient.

A27.18.3. High explosive cartridges consist of a column of explosives completely enclosed in a shell made of strong paper or polyethylene or a combination of paper and polyethylene, treated so that it will not absorb the liquid ingredient of the explosive.

A27.18.4. High explosive packaged bags made of strong paper of equally efficient material so treated or of such nature that it will not absorb the liquid ingredient of the explosive.

A27.18.5. High explosives packed in boxes which must be lined with strong, paraffined paper or other suitable material. The lining must be without joints or other openings or with cemented joints at the bottom, ends, or sides of the boxes. For explosives with liquid ingredients, the lining must be impervious to such ingredients and also to water. Box covers must be protected from contact with explosives by lining paper or other suitable material.

A27.18.6. Gelatine explosives in cartridges or bags must also have dry fine wood pulp or sawdust at least ¼ of an inch in depth spread over the bottom of the box or the bottom of the box may have a full area pad formed of an absorptive cellulose sheet which has a nitroglycerin absorptive value equivalent to sawdust as specified. Similar materials are required in boxes for packing all non-gelatinous types of explosives containing 30 percent or more of liquid explosive ingredient.

A27.18.7. Except for high explosive (gelatin dynamite) in cartridges, all cartridges of high explosives exceeding 4 inches in length and containing more than 10 percent of a liquid explosive ingredient must be placed horizontally in boxes. Pack bags with their filling holes up.

A27.18.8. Prevent movement of high explosives contained in cartridges and bags within the boxes by sufficiently tight packing.

A27.18.9. High explosive (dynamite), except gelatin dynamite, packed in bags or in cartridges over 2 inches in diameter and containing not more than 30 percent liquid explosive ingredients may be packed in outer packagings without sawdust and without lining paper, provided each inside or outer packaging is siftproof and is treated to prevent penetration by the commodity with which the container is filled for shipping.

A27.18.10. Liquid High Explosives Must Be Packed In DOT 15L wooden boxes and DOT 15M wooden boxes. The inside metal containers in the DOT 15M containers cannot contain more than 10 quarts of liquid explosives each.

A27.18.11. High Explosives with Liquid Explosive Ingredients.

A27.18.11.1. Package high explosives (dynamite) containing no more than 30 percent liquid explosive ingredients in the following specification containers.

A27.18.11.1.1. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. The gross weight of the boxes must not be over 65 pounds.

A27.18.11.1.2. Wooden boxes, DOT 14, 15A, 16A, 19B or fiberboard boxes, DOT 12H, 23F, or 23H with inside containers, which must be cartridges or bags. Inside cartridges must not be more than 12 inches in diameter by 36 inches in length or 50 pounds gross weight. Inside bags not over 50 pounds must be securely closed to

prevent leakage of contents. The gross weight of wooden boxes must not be over 75 pounds and the gross weight of fiberboard boxes must not be more than 65 pounds.

A27.18.11.1.3. Fiberboard boxes, DOT 23F or 23H, having one inside 26-gauge metal container, measuring not over 8 inches in diameter and 31 inches in length, containing high explosives (ammonium dynamite core) surrounded by a blasting agent. Gross weight must not be more than 65 pounds.

A27.18.11.2. High explosives (dynamite) containing 10 percent or less of a liquid ingredient must be prepared for shipment as follows:

A27.18.11.2.1. Packed in DOT 14, 15A, 16A, or 19B wooden boxes or in DOT 12H, 23F, or 23H fiberboard boxes. The gross weight must not be more than 140 pounds.

A27.18.11.2.2. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. The gross weight of the box must not exceed 65 pounds.

A27.18.11.3. Pack high explosives (dynamite) containing more than 30 percent liquid explosive ingredients in specification containers as follows:

A27.18.11.3.1. Wooden boxes (maximum gross weight 75 pounds), DOT 14, 15A, 16A, or 19B or fiberboard boxes, DOT 12H, 23F, or 23H, with inside containers that consist of:

A27.18.11.3.1.1. Cartridges not over 4 inches in diameter and not over 8 inches in length.

A27.18.11.3.1.2. Cartridges having a diameter of 4 to 5 inches and between 8 and 10 inches in length must be redipped in melted paraffin or equivalent material.

A27.18.11.3.1.3. Two or more cartridges that must be redipped because of their size must be enclosed in another strong paper shell to form a completed cartridge not more than 30 inches in length. The resulting cartridge must be dipped in melted paraffin or equivalent.

A27.18.11.3.1.4. The gross weight of wooden boxes must not be more than 75 pounds and the gross weight of fiberboard boxes must not be more than 65 pounds.

A27.18.11.3.2. In wooden or fiberboard specification boxes as prescribed inside containers may be paper or polyethylene bags meeting the following conditions:

A27.18.11.3.2.1. Paper bags:

A27.18.11.3.2.1.1. Must be paraffined two-ply paper not over 12 ¾ pounds capacity, securely closed by folding the tops and securing the fold by tape.

A27.18.11.3.2.1.2. Must insert no more than two such bags into another two-ply paper bag that must be securely closed and dipped in paraffin after closing.

A27.18.11.3.2.2. Polyethylene bags

A27.18.11.3.2.2.1. Must not be less than 0.0004 inches in thickness and no more than 12 ¾ pounds capacity each.

A27.18.11.3.2.2.2. Must not be more than two such securely closed bags packed in an intermediate polyethylene or paper bag. Securely close the polyethylene or paper bag and pack in polyethylene lined outside fiberboard boxes.

A27.18.11.3.2.3. The gross weight of wooden boxes must not be over 75 pounds, and the gross weight of fiberboard boxes must not be over 65 pounds.

A27.18.11.4. High explosives (gelatin dynamite and blasting gelatin) packed in specification containers as follows:

A27.18.11.4.1. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. Gross weight of boxes must not be over 65 pounds.

A27.18.11.4.2. Wooden boxes, DOT 14, 15A, 16A, or 19B or fiberboard boxes, DOT 12H, 23F, or 23H with inside cartridges or bags. The cartridges must not be more than 12 inches in diameter by 36 inches in length or 50 pounds in weight. Bags not completely sealed against leakage must be packed with filling holes up. The gross weight for wooden boxes must not be over 75 pounds, and the gross weight of fiberboard boxes must not be over 65 pounds.

A27.18.11.4.3. High explosives (straight gelatin dynamite of 80 percent strength and over and blasting gelatin) are packed in cartridges, or in bulk in outside boxes. When packed in bulk, boxes must be double lined throughout with paper and packed in wooden boxes, DOT 14, 15A, 16A, or 19B or 23 H. Pack DOT 23G fiberboard boxes in an outer container consisting of at least seven-ply heavy kraft paper. Two 3-mil polyethylene bags, one within the other, may be used in place of the double-lining paper when a DOT 12H is the outer packaging. Not more than one such double bag may be packed in DOT 12H fiberboard box. The gross weight of wooden boxes must not be more than 75 pounds and the gross weight of fiberboard boxes must not be over 65 pounds.

A27.18.12. High explosives with no liquid explosive ingredient and propellant explosives, class A. Packaging requirements:

A27.18.12.1. Wooden boxes, DOT 14, 15A, 16A, or 19B. The gross weight must not be more than 140 pounds.

A27.18.12.2. Fiberboard boxes, DOT 12H, 23F, or 23H. The gross weight must not be more than 65 pounds.

A27.18.12.3. Boxes must have an inside polyethylene bag having a minimum thickness of 6 mils, or must be lined with strong paraffined paper or other authorized material, DOT 2L. When such explosives contain over 5 percent moisture, boxes with handholes are not authorized.

A27.18.12.4. Outside boxes. When such explosives are in combination cartridges, consisting of a column of explosive with core of dynamite, they may be shipped when packed in outside boxes. The gross weight must not be over 65 pounds. The column of explosives must be completely enclosed in waterproofed cloth or waterproofed paper, and must not be more than 6 inches in diameter, 2 inches in length, or 25 pounds gross weight.

A27.18.12.5. Fiberboard boxes, DOT 23G. Gross weight of the box must not be over 65 pounds. The high explosives sensitiveness to percussion must not be greater than that measured by the blow delivered by an 8 pound weight dropping from a distance of 7 inches on a compressed pellet of the explosive 0.03 inch thick and 0.2 inch diameter. The compressed pellet is confined rigidly between hard steel surfaces as in standard Impact Testing Apparatus of the Bureau of Explosives during the test. Pack the high explosives in cartridges when their sensitiveness is greater than the limit prescribed herein. Such explosives, when dry, may be packed in strong siftproof cloth or paper bags of capacity not be over 25 pounds.

A27.18.13. High explosives with no liquid explosive ingredient nor any chlorate. Pack in one of the following outer containers:

A27.18.13.1. When high explosives contain over 5 percent moisture, the box must have an inside securely closed polyethylene bag having a minimum thickness of 6 mil; or the box must have a DOT 2L lining. Polyethylene is authorized only for materials that do not react with or cause decomposition of the plastic.

A27.18.13.2. When high explosives are in combination cartridges, consisting of a column of explosives with a core of dynamite, they may be packed in exterior containers with 65 pounds as the maximum gross weight. Completely enclose the column of explosives in waterproofed cloth or strong waterproofed paper, not more than 6 inches in diameter, 20 inches in length, or a gross weight of 25 pounds.

A27.18.13.3. Sensitiveness to percussion is not greater than that measured by the blow delivered by an 8-pound weight, dropping from a distance of 7 inches, or compressed pellet of the explosive 0.03-inch thick and 0.20-inch diameter, confined rigidly between hard steel surfaces as in the Standard Impact Testing Apparatus of the Bureau of Explosives. The requirement of packaging in cartridges, bags, or metal containers does not apply to plastic-bonded explosives. Pack and cushion to prevent movement of individual pieces within the outside shipping container. Pack in cartridges when their sensitiveness is greater than the limit prescribed in this section. Such explosives, when dry may be packed in strong siftproof bags, securely closed to prevent leakage, or in metal containers of capacity not over 60 pounds.

A27.18.13.4. Wooden boxes, DOT 14, 15A, 16A, or 19B. Gross weight must not be over 140 pounds. Wooden boxes, having inside metal containers that are tightly and securely closed, may be equipped with handholes in each end that must not be more than 1- by 4-inches and centered laterally not nearer than 1 5/8 inches from top edge of box.

A27.18.13.5. Fiberboard boxes, DOT 12H, 23F, 23G, or 23H. Gross weight must not be over 65 pounds.

A27.18.13.6. Metal drums (single-trip) DOT 17H or 37A having a minimum 0.003-inch thick polyethylene liner. Authorized only for Ammonium Perchlorate with particle size of 5 to 15 micrometers. Maximum capacity is 30 gallons.

A27.18.14. Amatol consisting of 80 percent ammonium nitrate and 20 percent Trinitrotoluene, Ammonium Picrate, Nitroguanidine, Nitrourea, Urea Nitrate, Picric Acid, Tetryl, Trinitroresorcinal, Trinitrotoluene, Pentolite, Cyclotrimethylentrinitramine

(desensitized), and Soda Amatol, in dry condition, may be shipped in containers with the following specifications:

A27.18.14.1. Those described in A27.18.13.

A27.18.14.2. Wooden boxes, DOT 14, 15A, 16A, or 19B, with strong paper or cloth bags of capacity not over 50 pounds, packed with filling holes up.

A27.18.14.3. Fiber drums, DOT 21C. Net weight not over 200 pounds.

A27.18.15. Trinitrotoluene and Pentolite in dry condition.

A27.18.15.1. Packed in containers described in A27.18.13.

A27.18.15.2. Packed in containers described in A27.18.14.

A27.18.15.3. Wooden boxes, DOT 14, 15A, 16A, 19B, or with strong paper or cloth bags of capacity not over 100 pounds, packed with filling holes up.

A27.18.15.4. Wooden boxes, DOT 14, 15A, 16A, or 19B, with strong siftproof liners, DOT 2L.

A27.18.15.5. Fiber drums, DOT 21C. Net weight must not be over 200 pounds.

A27.18.15.6. The following materials may be shipped dry, in quantity not more than 4 ounces in one outside package for medical purposes or as reagents, as drugs, medicines, or chemicals without other restriction, when in securely closed bottles or jars properly cushioned to prevent breakage:

A27.18.15.6.1. Ammonium picrate

A27.18.15.6.2. Dipicrylamine

A27.18.15.6.3. Dipicrly sulfide

A27.18.15.6.4. Dinitrophenylhydrazine

A27.18.15.6.5. Nitroguanidine

A27.18.15.6.6. Picramide

A27.18.15.6.7. Picric acid

A27.18.15.6.8. Picryl chloride

A27.18.15.6.9. Trinitroansisole

A27.18.15.6.10. Trinitrobenzene

A27.18.15.6.11. Trintrobenzoic acid

A27.18.15.6.12. Trinitro-m-cresol

A27.18.15.6.13. Trinitronaphthalene

A27.18.15.6.14. Trinitroresorcinol

A27.18.15.6.15. Trinitroltoluene

A27.18.15.6.16. Urea nitrate

A27.18.15.6.17. Triaminotrinitrobenzene

A27.18.15.6.18. Trichlortrinitrobenzene

A27.18.15.6.19. Hexanitrostilbene

A27.18.16. Ammonium Picrate, Picric Acid, Urea Nitrate, Trinitrobenzene, Trinitroresorcinol, Trinitrotoluene, Cyclotrimethylenetrinitramine, Cyclotetra-methylenetetranitramine, Pentaerythrite Tetranitrate (desensitized), or Trinitrobenzoic Acid when wet with not less than 10 pounds of water to each 90 pounds of dry material must be shipped in containers to comply with the following specifications:

A27.18.16.1. Metal barrels or drums, DOT 5B, or fiber drums, DOT 2C. Authorized only for Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetrainitramine, wet with not less than 10 pounds of water to each 90 pounds of dry material in inside containers which must be bags made of at least 10-ounce cotton duck rubber or rubberized cloth, and securely closed. The dry weight of Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetranitramine in one metal barrel or drum must not be more than 300 pounds and not more than 225 pounds in fiber drums. These bags containing the Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetranitramine each must then be placed in a rubber bag, rubberized cloth bag, or bag made of suitable watertight material that must be securely closed and then placed in the drum. If shipment of cyclotrimethylenetrinitramine is to take place at a time freezing weather is anticipated, it must be wet with a mixture of denatured ethyl alcohol or other suitable antifreeze and water of such proportions that freezing will not occur in transit.

A27.18.16.2. Fiber drum, DOT 21C, with inside polyethylene bag having 0.004 inch minimum thickness and liquid tight closure. Net weight must not be over 200 pounds. Authorized only for wet desensitized Pentaerythrite Tetranitrate.

A27.18.17. Amatol when cast or compressed in a solid block or column, in addition to containers prescribed in A27.18.5. may be shipped in metal drums, DOT 13A, not over 90 pounds gross weight.

A27.18.18. Pack nitrocellulose in wooden boxes complying with DOT 14, 15A, 16A, or 19B, with inside packages that must be:

A27.18.18.1. Wrapped in strong paraffined paper or suitable sparkproof material, when containing not more than 1 pound each of dry, uncompressed nitrocellulose. Completed outside package must not contain more than 10 pounds of dry nitrocellulose.

A27.18.18.2. Wrapped in strong paraffined paper when containing compressed sticks or blocks of dry nitrocellulose. Gross weight must not be over 75 pounds.

A27.18.19. Shaped charges, commercial, having exposed lined conical cavities that are covered will be paired together with the cavities facing each other and with one or more pairs in a fiber tube, or so arranged that the conical cavities of the shaped charges at the ends of the column face toward the center of the tube. The shaped charges in the fiber tubes must fit snugly with no excess space in the outer packaging. Shaped charges, commercial, must be packed in specification containers as follows:

A27.18.19.1. Wooden boxes, DOT 14, 15A, 16A, or 19B; gross weight must not be over 140 pounds.

A27.18.19.2. Fiberboard boxes, DOT 12H, 23F, or 23H; gross weight must not be over 65 pounds.

A27.18.19.3. Fiberboard boxes, DOT 12B; at least 275 pounds test double-wall corrugated fiberboard, with double-faced corrugated lining board having minimum test of 200 pounds. Individual charges of explosives must be packed in inside securely closed, waterproof plastic containers, or in securely closed waterproof container having metal ends. Inside individual containers must be separated by means of double-faced corrugated fiberboard partitions of material not less than 175 pounds (Mullen or Cady). Gross weight must not be over 65 pounds.

A27.18.19.4. Specially designed Navy steel cylindrical containers possessing a shock mitigation system. One each charge, to a container: four containers properly strapped or banded to a pallet.

A27.18.20. Cyclotrimethylenetrinitramine (RDX) (desensitized) in pellet form, dry may also be packed in specification containers as follows:

A27.18.20.1. Wooden box, DOT 15A or 19B, for pellets ¼ of an inch or less in diameter. Pellets must be packed in a slide-type fiber container with perforated fillers. All openings of the container must be securely closed with pressure-sensitive tape. Inside containers must be cushioned with at least 2 inches of sawdust between inner and outer containers. No inside container may contain more than ¾ pound net weight of explosive composition, and not more than 10 pounds of net weight explosive composition must be packed in one outside box.

A27.18.20.2. Wooden box, DOT 15A or 19B, for pellets exceeding ¼ inch in diameter. Pellets must be packed in a fiber tube with positive closures at both ends, and must be packed in a fiber container having not more than ¾ pound net weight of explosive composition. Inside containers must be cushioned with at least 2 inches of sawdust between inner and outer containers. Not more than 10 pounds of net weight of explosive composition must be packed in one outer packaging.

A27.18.21. Conversion kits, containing Comp. A-3 pellets, must be packed eight each to a fiberboard lined, metal ammunition components box, MK2. Kit components and separately packaged pellets must be securely nested within fiberboard separators in inside fiberboard boxes.

A27.19. Igniter Cord. Pack in strong, tight, outside fiberboard boxes or drums, wooden boxes, or metal containers.

A27.20. Initiating Explosive.

A27.20.1. Diazodinitrophenol or Lead Monoitroresorcinate. Packaged wet with not less than 40 percent by weight of water in:

A27.20.1.1. Metal barrels or drums, DOT 5 or 5B, with inside bags made of at least 10-ounce cotton duck, rubber, or rubberized cloth, which must be securely closed. The dry weight of Diazodinitrophenol in one container must not be more than 220 pounds, and the dry weight of lead mononitroresorcinate in one container must not be over 100 pounds. The bags containing Diazodinitrophenol must be placed in a rubber bag, rubberized cloth bag, or bag made of suitable watertight material, and then placed in the

barrel or drum. Any empty space in the outside bag must be filled with water, and this bag securely closed. Sufficient outage in the outer packaging must be allowed to prevent rupturing of the container in freezing weather, or a mixture of denatured alcohol and water may be used to prevent freezing in transit.

A27.20.1.2. Fiber drums, DOT 21C, not over 30-gallon capacity of at least 9-ply construction having in addition, a sheet of steel having a minimum base box of 75 pounds, not less than .008-inch thick, wound between the fifth and sixth plies. The inside ply of kraft paper must be laminated on each side with polyethylene to form a waterproof lining. The bottom head must be of fiber, metal covered on the outside, and must be attached to the body to form a watertight joint.

A27.20.1.2.1. Lead Mononitroresorcinate must only be packed wet, with not less than 40 percent by weight of water, and must be contained in at least two tightly sealed polyethylene bags of at least 0.004-inch thickness; this unit must then be placed in a tightly closed polyethylene bag of at least 0.004-inch thickness, and this assembly must be placed within a 0.006-inch thickness polyethylene (or other suitable plastic bag) completely filled with water and tightly closed. The 0.006-inch plastic bag must be of such a size as to completely fill the outside shipping container. The dry weight of lead Mononitroresorcinate only in one outer packaging must not be more than 100 pounds.

A27.20.2. Guanyl Nitrosomino Guanylidene Hydrazine. Packed wet with not less than 30 percent by weight of water in metal barrels or drums, DOT 5 or 5B, with inside containers which must be a bag made of 4-ounce duck. Inside the bag, and over the Guanyl Nitrosamino Guanylidene Hydrazine, there must be placed a cap of the same fabric, of the same diameter as the bag. The gag must be securely tied and placed in a strong grain bag and securely tied. The dry weight of Guanyl Nitrosamino Guanylidene Hydrazine in one container must not be over 75 pounds. The bag and contents must be packed in the center of the wooden barrel or keg, metal barrel or drum, and must be entirely surrounded by not less than 3 inches of well packed sawdust saturated with water. The wooden barrel or keg, or metal barrel or drum, must be lined with a heavy close-fitting jute bag, closed by secure sewing to prevent escape of sawdust. The barrel, keg, or drum must be inspected carefully and all leaks stopped. If freezing temperature is anticipated during shipment, use a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur during transit.

A27.20.3. Lead Azide (dextrinated type or otherwise prepared to effectively control grain size). Packed wet with not less than 20 percent by weight of water. Containers, packaging, and procedures are the same as prescribed in A27.20.2. except that the dry weight of Lead Azide in one container must not be over 150 pounds. The same freezing precautions apply.

A27.20.4. Lead Styphnate (Lead Trinitrosorcinate) or Barium Styphnate, Monohydrate. Packed wet with not less than 20 percent by weight of water in metal barrels or drums, DOT 5, 5B, or 17H with inside containers that must be a bag of rubber or rubberized cloth.

A27.20.4.1. The Lead Styphnate or Barium Styphnate, Monohydrate within this bag will be divided into a number of smaller packages. There must be a cap of the same material and of the same diameter as the bag over the Lead Sytphnate and inside the bag.

A27.20.4.2. The dry weight of Lead Styphnate or Barium Styphnate, Monohydrate in one outer container must not be over 150 pounds. The bag and contents must be packed in the center of the metal barrel or drum, and must be entirely surrounded by not less than 3 inches of well packed sawdust saturated with water.

A27.20.4.3. The metal barrel or drum must be lined with a heavy, close-fitting, jute bag closed by secure sewing to prevent escape of sawdust. The barrel or drum must be inspected carefully and all leaks stopped.

A27.20.4.4. If freezing temperature is anticipated during shipment, use a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur during transit.

A27.20.5. Nitro Mannite. Packed wet, with not less than 40 percent by weight or water container and packaging procedures are the same as A27.20.1. except that the dry weight of Nitro mannite in one container must not be over 100 pounds. The same freezing precautions apply.

A27.20.6. Nitrosoguanadine. Packed wet with not less than 10 percent by weight of water in metal barrels or drums, DOT 5, 5B, or 17H with inside strong cloth bag. The dry weight of Nitrosoguanidine in one container must not be over 75 pounds.

A27.20.7. Pentaerythrite Tetranitrate. Packed wet with not less than 40 percent by weight of water. Container and packaging procedures are outlined in A27.20.1. Except that the dry weight of Pentaertythrite Tetranitrate in one container must not be over 300 pounds. The same freezing precautions apply.

A27.20.8. Tetrazene. Packed wet with not less than 30 percent by weight of water. Container and packaging are the same as A27.20.2. The dry weight in one container must not be more than 75 pounds. The same freezing precautions apply.

A27.20.9. Fulminate of Mercury. Packed wet with not less than 25 percent by weight of water in DOT 5, 5B, or 17H metal drums or barrels with inside bag made of 4-ounce duck.

A27.20.9.1. Inside the bag and over the Fulminate, there must be placed a cap of the same fabric and of the same diameter as the bag. The bag must be securely tied and placed in a strong grain bag. This grain bag must also be securely tied.

A27.20.9.2. The dry weight of Fulminate in one container must not be over 150 pounds. Pack the bag and contents in the center of the wooden barrel, keg, or drum, entirely surrounded by not less than 3 inches of well-packed sawdust saturated with water.

A27.20.9.3. The barrel or drum must be lined with a heavy, close fitting jute bag closed by secure sewing to prevent escape of sawdust. Inspect the barrel or drum carefully, to stop all leaks.

A27.20.9.4. If shipment of Fulminate of Mercury is to take place at a time that freezing weather is to be anticipated, use a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur in transit.

A27.21. Rocket motors; Jet Thrust Units; Igniters, Rocket Motors; or Igniters, Jet Thrust (Class A Explosives). Package in:

A27.21.1. Wooden boxes or wooden boxes fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B.

A27.21.2. Metal Containers, MIL-D-6054 or other metal containers approved by the DOT.

A27.21.2.1. Igniters or igniter components may be shipped in the same outer packaging with the rocket motor or jet thrust unit if separately packed in unit package (metal can, fiberboard box, etc).

A27.21.2.2. Rocket motors must be shipped in nonpropulsive state. When military air shipment of a rocket motor in a propulsive state is required, the shipper must obtain written approval from hazard classification authority listed in TB 700-2/NAVSEAINST 8020.8B/T.O. 11A-1-47/DLAR 8220.1, DOD Explosive Hazard Classification Procedures.

A27.22. Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors, Igniters, Rocket Motors; Igniters, Jet Thrust; Igniters, Ramjet Engine (Class B explosives) or Starter Cartridge, Jet Engine. Package requirements:

A27.22.1. Wooden boxes or wooden boxes fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B. Packages containing igniters, ramjet engines must not be over 500 pounds gross weight.

A27.22.2. Wooden boxes, DOT 15B, authorized only for igniters, jet thrust (jato) class B or igniters, rocket motor igniters, ramjet engine, class B explosive. Packages containing igniters, ramjet engine must not be over 500 pounds gross weight.

A27.22.3. Service-designated and NAVAIR/NAVSEA-approved wood or metal containers identified by Ordnance Requirement (OR), MIL-STD, or other appropriate container document, and a letter container designated, such as MK and MOD or CNU numbers.

A27.22.4. MIL-D-6054 drums (MS 63052) with specially designated interior blocking and bracing. Authorized for jet thrust units, class B explosives only.

A27.22.5. LAU-10/A Launcher, using unit load adapterMK58, MOD 1 and palletized with WR-54/ 115C, which consists of 16 units per shipment of rocket motors, class B explosives.

A27.22.6. MK4 metal container with properly designed interior mounting or blocking supports. Authorized for packed one each M77A1 rocket.

A27.22.7. Fiberboard box, DOT 23F, authorized for Igniters, Jet Thrust (jato), Class B, Igniters, Rocket Motor, Class B, or Starter Cartridges, Jet Engine, Class B only which must be packed in tightly closed inside fiberboard boxes, at least 200 pound test (Mullen or Cady), or metal containers. Starter Cartridges, Jet Engine, must have igniter wires short-circuited when packed for shipment.

A27.22.8. Wooden boxes, specification MIL-B-2427, Grade A, Style 4, Type II, containing eight igniters packed one each in inside hermetically sealed metal containers.

A27.22.8.1. Igniters or igniter components may be shipped in the same container with jet thrust units. When approved by military specifications or drawings.

A27.22.8.2. Rocket motors must be nonpropulsive in shipment. When military air shipment of a rocket motor in a propulsive state is required, the shipper must obtain

written approval from hazard classification authority listed in TB 70-2/NAVSEAINST 8020.3/T.O. 11A-1-47/DLAR 8220.1, DOD Explosive Hazard Classification Procedures.

A27.23. Railway Torpedoes. Packaging Requirements:

A27.23.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B are authorized; however, the net weight in wooden boxes must not be over 125 pounds.

A27.23.2. Fiberboard boxes, DOT 12H, 23F, or 23H are authorized; however, the gross weight must not be over 65 pounds.

A27.23.3. Fiberboard boxes, DOT 12B, with inside cartons are authorized. The inside cartons must not contain over 72 track torpedoes each. The gross weight of the exterior fiberboard box must not be over 65 pounds.

A27.23.4. Fiberboard boxes, DOT 12B, without inside containers may be used for not more than 50 track torpedoes provided the smallest dimension of the box is at least 6 inches.

A27.24. Propellant Explosives, Solid or Liquid (Class A or B Explosives). Package Requirements:

A27.24.1. Tight metal cases in tight wooden boxes free from loose knots and cracks, or tight metal containers. Gross weight must not be over 200 pounds.

A27.24.2. Wooden boxes, DOT 14, 15A, or 19B metal lined DOT 2F. Gross weight must not be over 200 pounds.

A27.24.3. Wooden boxes, DOT 14, 15A, 19B, or fiberboard boxes, DOT specifications 23F, or 23H, with inside cloth or paper bags of capacity must not be over 25 pounds net weight. Each bag must be capable of withstanding, when filled, at least 2 drops on end from a height of 4 feet without breaking or sifting of contents. Net weight of contents in outer packaging must not be over 50 pounds.

A27.24.4. Wooden boxes, DOT 14, 15A, 15B, 15C, 19B, or fiberboard boxes, DOT 12B, or 23H, with inside containers that must be DOT 13 metal kegs. Fiberboard boxes must contain not more than six metal kegs not over 5 pounds net weight each in one outer packaging. Gross weight of wooden boxes must not be over 200 pounds, and fiberboard boxes must not be more than 65 pounds.

A27.24.5. Wooden boxes, DOT 14, 15A, 15B, 15C, or 19B fiberboard boxes, DOT 23F or 23H, with inside strong metal containers. A maximum of four inside containers must not be more than 25 pounds each. Gross weight of fiberboard boxes must not be more than 65 pounds.

A27.24.6. Fiber drums, DOT 21C. Drums having wooden heads must contain a strong sift-proof liner. Authorized net weight not over 265 pounds.

A27.24.7. Wooden boxes, DOT 14, 15A, 16A, or 19B not lined, authorized only for grains not less than 1 inch in diameter or 3 inches in length, provided such grains are tightly packed and are coated with a protective material. Gross weight must not be over 200 pounds.

A27.24.8. Other wooden boxes and fiberboard boxes approved by the military services may be used instead of DOT specification containers.

A27.24.9. Wooden boxes, DOT 14, 15A, 15B, 19B, or fiberboard boxes, DOT 12H, 23F, or 23H with inside fiber or metal containers of not more than a 1 ¾ pound capacity each. Gross weight of wooden boxes must not be over 200 pounds, and fiberboard boxes must not weigh over 65 pounds.

A27.24.10. Conversion kits, containing Propellant Explosives, Class A, are packed eight each to a fiberboard lined, metal ammunition components box, MK2. Kit components and separately packaged pellets must be securely nested within fiberboard separators.

A27.24.11. Fiberboard boxes, DOT 12H, 23G, or 23H with inside securely closed polyethylene bags having a minimum wall thickness of 6 mils.

A27.24.11.1. Propellant Explosives (Smokeless Powder for Cannon or Small Arms) in water, must be packed in containers to comply with the following specifications:

A27.24.11.2. Metal barrels or drums, DOT 5, 5A, 5B, 6B, or 6C.

A27.24.11.3. Wooden boxes, DOT 15A or 19B, metal lined DOT 2F.

A27.24.12. Pack Propellant Explosives (liquid) in specific containers as follows:

A27.24.12.1. Wooden boxes or wooden boxes fiberboard lined, DOT 15A, 15B, or 15E, with inside polyethylene bottles having taped screw cap closures, not over 1-gallon capacity each. Each bottle must be entirely contained within a polyethylene or other suitable plastic bag formed of material not less than 0.004-inch thickness, with ends securely closed. Each bottle in the plastic bag must be enclosed in a tight metal container, and be surrounded on all sides with at least 2 inches of incombustible cushioning material. Cans in the outside box must also be cushioned from each other and the sides, top, and bottom of the container.

A27.24.12.2. Metal barrels or drums, DOT 5B, 6B, 6C, 6D, or 17C, with inside polyethylene, DOT 2S, container packed inside a strong, tight metal drum and securely closed, or inside glass-lined aluminum carboy not over a 12-gallon capacity. Inside steel or glass-lined carboy must be surrounded on all sides with at least 2 inches of incombustible absorbent cushioning material uniformly distributed. Polyethylene containers are authorized only for liquids that do not react dangerously with plastic or result in container failure. Containers must not be entirely filled; sufficient interior space must be left vacant to prevent leakage or distortion of containers due to expansion of the contents from increased temperatures during transit.

A27.24.13. Propellant Explosives (solid) with small arms primers, must be packed as follows:

A27.24.13.1. Inside containers must be tightly closed metal cans or fiber containers, not over 1-pound each or not containing more than one-grain of propellant (not exceeding 5 pounds each). The inside container must be packed to prevent movement within the outer packaging.

A27.24.13.2. Not more than 1,000 small arms packed as prescribed in A27.7.3. may be included in one outside shipping container with solid propellant explosives. The inside container must be packed to prevent movement within outer packaging.

A27.24.13.3. Wooden boxes, DOT 15A, 15B, 15C, or 19B.

A27.24.13.4. Fiberboard boxes, DOT 12B, 23F, or 23H. Not more than 10 pounds of propellant explosives may be shipped in one outer packaging.

A27.24.14. Document destroyer with starter must be packaged as follows:

A27.24.14.1. Metal or fiber drums with inside containers and items consisting of five 20-pound packages of sodium nitrate in kraft bags lined with polyethylene; 2 pounds of sodium nitrate, 0.2-0.4 percent Anti-caking Tricalcium Phosphate, and 2 pounds of sugar mixed with ¼ pound of charcoal in kraft bags lined with polyethylene; Two Igniter Incendiary M-25 consisting of the M-201A1 fuse adapted to the M-1 fire starter approximately 1 inch in diameter by 2 ¾ inches high cellulose acetate body filled with petroleum jelly; one 24-inch two mesh wire screen; safety matches. Net weight of contents must not be more than 120 pounds.

A27.24.14.2. Metal drums (Army drawing D-4 11-34) with inside fiber drums and items consisting of sodium nitrate, a 2-inch tube filled with charcoal, sodium nitrate, and sugar. The inside drum is positioned to form a 2-inch annulus which is filled with sodium nitrate.

A27.25. Rocket Ammunition with (Inert Loaded Projectiles, Solid Projectiles, Empty Projectiles, Explosive Projectiles, Gas Projectiles, Smoke Projectiles, Incendiary Projectiles, or Illuminating Projectiles). Pack in strong wooden or metal containers or aluminum containers approved by military specification or drawings.

A27.26. Small Arms Ammunition and Small arms Ammunition, Tear Gas Cartridges. Pack in pasteboard or other inside boxes, or in partitions designed to fit snugly in the outer packaging, or pack in metal clips. The partitions and metal clips must be designed to protect the primers from accidental damage. The inside boxes, partitions, and metal clips must be packed in securely closed strong outside wooden or fiberboard boxes or metal containers. Blank industrial power load cartridges may be packed in bulk in securely closed fiberboard boxes.

A27.27. Toy Caps. Toy caps must not contain more than an average of ¼ grain of explosive composition per cap, and must be packed in inside packages constructed of paperboard not less than 0.013-inch thick, or metal not less than 0.008-inch thick, or noncombustible plastic not less than 0.015-inch thick. The material must provide a complete enclosure, and the minimum dimensions of each side or end of such package must be not less than 1/8 of an inch in height. The number of caps in an inside package must be limited so that not more than 10 grains of explosive composition is packed into 1 cubic inch of space, and not more than 17.5 grains of explosive composition of toy caps is packed in any inside container.

A27.27.1. Pack Toy Caps In:

A27.27.1.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. Gross weight must not be over 150 pounds.

A27.27.1.2. Fiberboard boxes, DOT 12B. Gross weight must not be over 65 pounds.

A27.27.1.3. Wooden boxes in good condition, and weighing not more than 100 pounds gross.

A27.28. Explosive Power Device, Class B. Packing requirements:

A27.28.1. Wooden boxes or wooden boxes, fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B.

A27.28.2. Containers authorized by military specification or drawings.

A27.29. Rocket Engine (Liquid), Class B Explosives. Pack in strong, airtight metal containers approved by military specification or drawings. Follow handling instructions and special requirements in A3.3.1.8.

A27.30. Cartridge, Practice Ammunition. Pack in inside boxes, partitions, or metal clips to protect primers from accidental firing, then place in:

A27.30.1. A strong wooden box closed by strapping.

A27.30.2. A fiberboard box closed by strapping or taping.

A27.30.3. A metal container.

A27.31. Blasting Agent N.O.S.. Packaging Requirements:

A27.31.1. Rigid packages (for example, boxes and drums), prepared as for shipment, must be capable of withstanding a 4-foot drop onto solid concrete so as to strike the most vulnerable point on the package without rupture of any loss of contents.

A27.31.2. Nonrigid packages (for example, tubes and bags), prepared as for shipment, must be capable of withstanding three 4-foot drops onto solid concrete without rupture of any loss of content.

A27.32. Oil Well Cartridges. Pack so that explosive composition is not over 20 grains per cubic inch of space in the following shipping containers:

A27.32.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. Gross weight must not exceed 150 pounds.

A27.32.2. Fiberboard box, DOT 15B. Gross weight must not exceed 65 pounds.

A27.33. Moderate Ammunition Explosive Hazards. Pack in strong fiberboard or wooden boxes. The ammunition may also be packed in wooden or metal barrels or drums.

A27.34. Tear Gas Grenades. Package requirements:

A27.34.1. Metal-strapped wooden boxes, DOT 15A, 15B, 15C or 19B. Functioning elements not assembled in grenades or devices must be in a separate compartment of these boxes either inside or separate outside boxes, DOT 15A, 15B, 15C or 19B. The elements must be packed and cushioned so they do not come in contact with each other or with walls of the boxes during transportation. Not more than 50 grenades and 50 functioning devices must be packed in one outside container. The gross weight of the package must not be over more than 75 pounds.

A27.34.2. Metal drum (single-trip) DOT 37A. Functioning elements must be packed in separate compartments. Not more than 24 grenades and 24 functioning devices may be packed in one outside container. The gross weight of the container must not be more than 75 pounds.

A27.34.3. Metal container, CNU-79/E, containing dispenser and 40 modules (32 bomblets containing orthochlorbenzalmalononitrile with a limited explosive train for expelling charge

so designed and arranged and that neither propagation between modules nor accidental functioning can occur during transportation. Gross weight of container must not be over 1,200 pounds. Mark each outside container "TEAR GAS GRENADES".

A27.34.4. Grenades or other similar devices may be shipped completely assembled, provided the functioning elements are packed so that they do not accidentally function.

A27.34.5. Riot control canister cluster, E158 or E159 packed in a plywood box, PP-B-601. Mark each outside container "TEAR GAS GRENADE (DEVICE)".

Table A27.2. DOT/Military Specification Cross Reference.

DOT Specification	Military/Federal Specification	Description
1A	None	Boxed carboys
2C	PPP-B-636, Type CF-DW, 275	Inside containers, corrugated fiberboard carton
2F	PPP-C-96	Inside metal container and liner
2L	None	Lining for boxes
2S	MIL-D-40030, Styles A and B	Polyethylene containers
5	PPP-P-704, Type I, Class 7 and 10	Steel barrels or drums
5B	PPP-P-704, Type I, Class 4; Type III, Class 7 and 8; PPP-D-729, Type 1, Class A and B	Steel barrels or drums
6B	PPP-D-736, Type III and IV	Steel barrels or drums
6C	None	Steel barrels or drums
6D	PPP-C-1337, Type I, Class 3 and 4, Type II	Cylindrical steel overpack, straight sided for inside plastic container
12B	PPP-B-636, Type CF or SF, V3c	Fiberboard boxes
12H	PPP-B-636, Type CF, V3c, Style FTC	Fiberboard boxes
13	None	Metal kegs
13A	None	Metal drums
14	None	Wooden boxes, nailed
15A	PPP-B-621, Styles 1, 2, 2 ¾, 6, and 7, MIL-B-2427, Types I, II, III. MIL-B-48024, Type I and II.	Wooden boxes, nailed.
15B	PPP-B-621, Style 1, 2, 2 ¾, 6, and 7. MIL-B-2427, Type I, II, III. MIL-B-48024, Type I and II	Wooden boxes, nailed
15C	PPP-B-621, Style 1, 2, 2 ¾, 6, and 7.	Wooden boxes, nailed

DOT Specification	Military/Federal Specification	Description
	MIL-B-2427, Type I, II, III. MIL-B-48024, Type I and II.	
15E	None	Wooden boxes, fiberboard lined
15L	None	Wooden boxes with inside containers for desensitized liquid explosives
15M	None	Wooden boxes, metal lined, with inside containers for desensitized liquid explosives
16A	PPP-B-585; MIL-B-46506	Plywood or wooden boxes, wirebound
17C	PPP-P-704, Type I, Class 4 and 9; Type II, Class 10 and 11. PPP-D-736, Type V and VI	Steel drums
17H	PPP-D-729, Type IV; PPP-D-705, Type V; PPP-P-704, Type II, Class 7	Steel barrels or drums
19A	PPP-B-601; MIL-B-48024	Wooden boxes, glued plywood, cleated
19B	None	Wooden boxes, glued plywood, nailed
21C	None	Fiber drum
23F	PPP-B-636, Type CF and SF	Fiberboard boxes
23G	None	Special cylindrical fiberboard box for high explosives.
23H	PPP-B-636, Type SF	Fiberboard boxes
37A	PPP-P-704, Type II, Class 1,3,5,8, and 9; Type III, Class 1,3, and 6; MIL-D-13901	Steel drums

Attachment 28

INSPECTION PROCEDURES

A28.1. Inspection General Requirements. Inspect hazardous materials before entering into the military airlift system. The inspection will ensure hazardous materials are properly prepared and documented. Follow the guidelines in this attachment when inspecting hazardous materials, including opening an external container to inspect the internal packagings.

A28.1.1. Originating Shipping Activities. This activity must prevent entry of improper shipments into the transportation system. Establish a quality control program that ensures packing, marking, labeling, and certifying of hazardous materials comply with this manual and safety of airlift criteria.

A28.1.1.1. Inspect each package to ensure the packaging is correct and in good condition.

A28.1.1.2. Open exterior containers if there is physical evidence to support suspected damage of the inner receptacles or if the external markings do not correspond to the type of container. Reseal opened containers according to the applicable test report or SPI.

A28.1.1.3. Provide graduated dip-stick with any vehicle or wheel engine-powered SE without an operational fuel gauge containing fuel-in-tank. Not required if the item is drained and purged or drained to 500 ml (17 ounces) or less of residual fuel.

A28.1.1.4. Check shipper's certification for overall accuracy including correct packaging paragraph.

A28.1.1.5. Immediately remove damaged or improperly prepared packages from the transportation system.

A28.1.1.6. Periodically inspect cylinders or spheres to ensure they have been retested and marked as required by 49 CFR Part 180, Subpart C and DLAI 4145.25/AR 700-68/NAVSUPINST 4440.128/MCO 10330.2B/ AFMAN 23-227_IP, *Storage and Handling of Compressed Gases and Cylinders*. Do not offer for transportation any cylinder or sphere not meeting this requirement.

A28.1.2. Inspectors Other Than Originating Shipping Activity. Establish an inspection program at each Aerial Port of Embarkation to prevent improperly prepared hazardous material from entering the transportation system.

A28.1.2.1. As a minimum, visually inspect all exterior containers and equipment for damage or leakage. Reject packages showing evidence of leakage (moisture or staining) or other suspected damage until corrective action is taken to make sure the item is safe for air shipment (see **paragraph 1.7**).

A28.1.2.2. Remove improperly prepared or damaged containers from the transportation system and advise the shipper to immediately coordinate corrective action. Properly store suspect packages containing explosive material pending repair or disposition.

A28.1.2.3. Use accurate fuel gauges, graduated dip-sticks or other positive means to determine the amount of fuel-in-tank for vehicles and equipment. If positive means is not available, drain and refill fuel tank to appropriate level in the presence of an inspector.

A28.1.2.4. Review all Shipper's Declarations for Dangerous Goods for accuracy. Make sure special instructions and warning labels are complete and being followed.

A28.1.2.5. Enter "Inspected by (followed by name of inspector, location, and date)" in key 6 of the Shipper's Declaration form. The "Inspector" cannot be the same individual who completes the Shipper's Declaration for Dangerous Goods and signs Key 22.

A28.1.2.6. Do not violate compatibility requirements (**Attachment 18**) in the consolidation or makeup of cargo loads.

A28.1.2.7. Prepare SF 364, Report of Discrepancy, according to DLAI 4140.55/AR 735-11-2/ SECNAVINST 4355.18A/AFJMAN 23-215 (or equivalent reporting means as designated by the Service Focal Points and coordinated with HQ AMC) for any deficiencies discovered.

A28.1.2.8. The Contingency Response Group (CRG), Departure Airfield Control Group (DACG), or Contingency Response Element/Team (CRE/CRT) or Cargo Deployment Function (CDF) provides qualified inspectors for the mobility movement inspection function during tactical or contingency deployments, redeployments, and exercises (see **paragraph 1.2.6**).

A28.1.2.9. **Figure A28.1** is an example of inspection record format.

A28.2. Inspection Packaging Procedures. Design inspection procedures to validate safety of the shipment. Do not physically damage the package or perform any function that adversely affects the integrity or original performance capability of the packaging.

A28.2.1. Packaging Areas of Emphasis. As a minimum, inspection will address the following areas:

A28.2.1.1. Single Packaging.

A28.2.1.1.1. Drum ullage.

A28.2.1.1.2. External visual condition and serviceability. Dents or corrosion at chime or seam, or dents causing paint chipping is considered damaged and must be removed from the transportation system.

A28.2.1.1.3. External package marking and labeling. Verify UN specification code (including package type and gross weight), for air eligibility, hazard and handling markings/labels.

A28.2.1.2. Combination Packaging.

A28.2.1.2.1. Inner receptacle orientation.

A28.2.1.2.2. Inner receptacle ullage.

A28.2.1.2.3. Inner receptacle secondary closure.

A28.2.1.2.4. Absorbent cushioning material.

A28.2.1.2.5. Leak-proof liner (covering item or lining outer container).

A28.2.1.2.6. Air-eligible.

A28.2.1.2.7. External package markings including UN specification code, air-eligible, hazard and handling marking/labels, orientation markings for combination packagings and drums used as overpacks.

A28.2.1.3. Vehicles and Equipment.

A28.2.1.3.1. Fuel gauges operative or graduated dip-stick available.

A28.2.1.3.2. Fuel in tank quantity, including verifying presence of additional fuel tanks.

A28.2.1.3.3. Fuel leaks.

A28.2.1.3.4. Battery terminal posts protected against short circuit.

A28.2.1.3.5. Fire extinguishers secured in properly configured and approved holders.

A28.2.1.3.6. Spare fuel and secondary loads properly identified, packaged, stowed, and restrained.

A28.2.2. Packaging Opening and Closing. The following instructions provide acceptable procedures for opening external containers to inspect the internal packaging configuration. Comply with these procedures to maintain the performance capability of the package and the original shipper's certification. Noncompliance with any of these procedures constitutes repacking and requires a new certification.

A28.2.2.1. Fiberboard box opening.

A28.2.2.1.1. Cut original tape along seam using a shallow blade knife. Do not tear tape.

A28.2.2.1.2. If adhesive sealed on inside box flaps or the flaps are stitched/stapled (not closed by tape) opening will damage packaging components.

A28.2.2.2. Fiberboard box closure.

A28.2.2.2.1. Apply new tape over the existing tape using same method as original.

A28.2.2.2.2. Use only ASTM D 5486, Type I, Class 2 (film backed, pressure-sensitive adhesive, weather resistant) tape to reclose package.

A28.2.2.2.3. Ends of sealing tape must extend over the original tape a minimum of one-inch adhering to the fiberboard on the ends of the package.

A28.2.2.2.4. Use three-inch wide tape or two strips of two-inch wide tape.

A28.2.2.2.5. Ensure surface is clean and dry before applying tape and box flaps meet squarely.

A28.2.2.2.6. Do not cover markings or labels with tape.

A28.2.2.2.7. When reclosed using these procedures a new shipper's certification is not required. Based on DOD testing the packaging is considered returned to original condition and is not considered repacking.

A28.2.2.2.8. If adhesive sealed on inside box flaps or flaps are stitched/stapled (not closed by tape) then reclosure is considered repacking and requires a new shipper's certification.

A28.2.2.3. Wood box opening.

A28.2.2.3.1. Opening causes damage to packaging material.

A28.2.2.3.2. To reduce damage to wood material, use a nail puller to remove nails.

A28.2.2.3.3. Do not pry open wood box panels using crowbars, etc.

A28.2.2.4. Wood box closure.

A28.2.2.4.1. Do not close by nailing through existing holes.

A28.2.2.4.2. Must replace damaged components. Use prescribed materials and specifications required by the applicable test report, special packaging inst ruction, or drawing.

A28.2.2.4.3. Replacing packaging material components is considered repacking and requires a new shipper's certification.

A28.2.2.5. Drum opening. Only open drums used as a combination package or overpack. Do not open drums used as a single package for liquid hazardous material.

A28.2.2.6. Drum closure.

A28.2.2.6.1. Replace old gaskets with new gaskets and seals. Old gaskets will "set" and will not reseal properly.

A28.2.2.6.2. Use the torque and closing instructions required by the applicable test report.

A28.2.2.6.3. Reclosure of drum is considered repacking and requires new shipper's certification.

A28.2.2.7. Overpacks.

A28.2.2.7.1. Outer packaging used as an "Overpack" (for ease of handling) may be opened for inspection of contents. Follow inspection guidance for specific opening and closing of inside shipping containers according to A28.2.2.

A28.2.2.7.2. Close overpacks in a similar manner as received. A new shipper's declaration is not required.

A28.2.2.8. Non-Specification (strong outside) Packaging.

A28.2.2.8.1. Non-specification packaging may be opened for inspection.

A28.2.2.8.2. Close non-specification packaging in a similar manner as received. A new shipper's declaration is not required.

A28.2.2.9. UN Specification Jerricans.

A28.2.2.9.1. Caps may be removed for inspection.

A28.2.2.9.2. Re-secure cap (hand-tight) ensuring there is no "cross-threading. " A new shipper's declaration is not required.

A28.2.2.10. Shrink Wrap Packages. Do not cut, tear, or remove stretch or shrink wrap to verify packaging. Reject shipments if stretch or shrink wrap is cut, torn, or damaged so that it would prevent packages containing liquid hazardous materials from tipping or

becoming loose in flight, or for any package that would be a hazard during handling operations.

A28.2.3. Inner package inspection.

A28.2.3.1. Perform visual inspection. Do not rearrange inner packaging contents or configuration.

A28.2.3.2. Do not cut wraps or barrier material.

A28.2.3.3. Any change to the inner configuration is considered repacking and requires a new shipper's certification.

A28.2.4. Exceptions to inspection. Some item packaging requires specialized training for opening, interior inspection, and closure. Only individuals trained and qualified in these specialized areas are authorized to open the following packagings:

A28.2.4.1. Radioactive material

A28.2.4.2. Class 1 (ammunition and explosives)

A28.2.4.3. Etiological Agents or Infectious Substances

A28.2.4.4. Pressurized metal shipping containers or drums

A28.2.4.5. Material identified as "inhalation hazard"

A28.3. Inspection Checklist. Inspection activities will establish a program that standardizes the local inspection process and ensures continuous level of quality. **Figure A28.1** provides a suggested checklist to use during the inspection process.

Figure A28.1. Hazmat Inspection Checklist.

HAZMAT INSPECTION AND ACCEPTANCE CHECKLIST				TCN
INSPECTION VALIDATION				
THE SHIPMENT HAS BEEN INSPECTED AND		COMPLIES WITH ALL REGULATORY REQUIREMENTS		DOES NOT COMPLY WITH ALL REGULATORY REQUIREMENTS AS INDICATED
DATE *(YYYYMMDD)*	INSPECTED BY *(NAME)*	DATE *(YYYYMMDD)*		CORRECTED BY *(NAME)*
DATE *(YYYYMMDD)*	RE-INSPECTED BY *(NAME)*			CORRECTIVE ACTIONS CHECKED. SHIPMENT COMPLIES WITH ALL REGULATORY REQUIREMENTS.

ENTER "X" TO IDENTIFY NONCOMPLIANCE. USE COMMENTS BLOCK TO PROVIDE ADDITIONAL DETAILS. CIRCLE "X" WHEN CORRECTIVE ACTION IS COMPLETED. SIGN INSPECTION VALIDATION BLOCK AND ATTACH TO SHIPPER'S DECLARATION FIELD WITH STATION MANIFEST. THOSE ITEMS THAT APPLY ONLY TO RADIOACTIVE MATERIAL ARE IDENTIFIED BY AN "". ADDITIONAL COMMENTS ON THE REVERSE.*

	SHIPPER'S DECLARATION		PACKAGING - OUTER
	1. THREE ORIGINAL DOCUMENTS FOR EACH PROPER SHIPPING NAME (PSN) UNDER A SINGLE TCN		39. CONTAINER SERVICEABLE; DAMAGE, LEAKAGE, OR LOSS OF CONTENTS
	2. SHIPPERS ADDRESS AND PHONE NUMBER		40. APPROVED OUTER CONTAINER *(IF REQUIRED)*
	3. CONSIGNEE DODAAC OR ADDRESS *(OR WORLDWIDE MOBILITY)*		41. PACKAGING PERMITTED BY PACKAGING REFERENCE
	4. TRANSPORTATION CONTROL NUMBER (TCN)		42. OTHER
	5. AIRPORT OF DEPARTURE AND DESTINATION *(OR WORLDWIDE MOBILITY)*		IF APPLICABLE
	6. NAME AND TITLE OF PREPARER WITH SIGNATURE		43. ULLAGE
	7. PLACE AND DATE MATERIAL CERTIFIED		44. UN SPECIFICATION CONTAINER MATCHES CORRESPONDING PACKING GROUP
	8. PEN AND INK CHANGES SIGNED		45. GROSS WEIGHT OF PACKAGE IS EQUAL TO OR LESS THAN TESTED WEIGHT INDICATED AS PART OF UN SPECIFICATION MARKING
	9. EMERGENCY RESPONSE NUMBER		46. SINGLE PACKAGE (CONTAINING A LIQUID) TESTED PRESSURE (KPA) AGREES WITH CONTAINER REQUIREMENTS
	10. OTHER		47. OTHER
	CARGO IDENTIFICATION *(NATURE & QUANTITY OF HAZMAT)*		PACKAGING –INNER *(IF INSPECTED AND APPLICABLE)*
	11. IDENTIFIES WHETHER PACKED WITHIN PASSENGER OR CARGO AIRCRAFT ONLY LIMITATIONS		48. ABSORBENT MATERIAL
	12. IDENTIFIES RADIOACTIVE OR NONRADIOACTIVE SHIPMENT		49. LEAK OR ACID PROOF LINER
	13. PSN *(WITH TECHNICAL NAME IF IDENTIFIED BY "*")*		50. INNER RECEPTACLE ORIENTATION
	14. PRIMARY HAZARD CLASS OR DIVISION *(COMPATIBILITY GROUP FOR EXPLOSIVES)*		51. SECONDARY CLOSURE
	15. IDENTIFICATION NUMBER *(UN, ID, OR NA)*		52. OTHER
	16. PACKAGING GROUP (PG) IF APPLICABLE		MARKING
	17. SUBSIDIERY RISK CLASS OR DIVISION, IF ASSIGNED		53. PSN AND UN, ID, OR NA NUMBER *(FOR MULTIPLE ITEMS IN OVERPACK, EACH HAZARD IS IDENTIFIED)*
	18. NUMBER AND TYPE OF PACKAGES		IF APPLICABLE
	19. NET QUANTITY PER PACKAGE *(METRIC UNLESS EXCEPTED)*		54. UN SPECIFICATION MARKING
	20. R-ACTIVITY PER PACKAGE GIVEN IN BECQUEREL SYSTEM		55. "RQ"
	21. R-NAME AND SYMBOL OF MATERIAL		56. "WASTE"
	22. R-MATERIAL PHYSICAL AND CHEMICAL FORM		57. "INHALATION HAZARD" *(NOT REQUIRED IF PART OF LABEL)*
	23. PACKAGING PARAGRAPH *(FROM ATTACHMENTS 5-13)*		58. AIR ELIGIBLE MARKING FOR LIQUIDS
	24. A3.1.7.3 USED WHEN UN SPECIFICATION TESTED PACKAGE IS OVERPACKED TO MEET AIR REQUIREMENTS		59. "INNER (INSIDE) PACKAGE (CONTAINER) COMPLIES WITH PRESCRIBED SPECIFICATIONS" USED WHEN SHIPPER'S DECLARATION STATES "OVERPACK USED" OR WHEN OTHERWISE REQUIRED
	25. DOT-SP, COE, CAA, OR OTHER APPROVED DOCUMENT USED AS CERTIFICATION REFERENCE *(COPY ACCOMPANIES SHIPMENT)*		60. "ORIENTATION" ARROWS ON COMBINATION PACKAGES CONTAINING LIQUIDS OR PACKAGES CONTAINING WET CELL BATTERIES
	26. 49 CFR, IATA, OR ICAO REFERENCE USED AS CERTIFICATION REFERENCE *(IF MEETING PASSENGER RESTRICTIONS)*		61. "LIMITED QUANTITY" OR "LTD QTY"
			62. FLASHPOINT *(FOR FLAMMABLE LIQUIDS)*
	27. R-CATEGORY OF RADIOACTIVE PACKAGE		63. "ORM-D" OR "ORM-D AIR" FOR DOMESTIC ONLY SHIPMENT OF PSN "CONSUMER COMMODITY" *(NOT IDENTIFIED AS A CLASS 9)*
	28. R-TRANSPORT INDEX		64. DOT-SP NUMBER *(WHEN USED AS CERTIFICATION REFERENCE)*
	IF APPLICABLE		65. COE NUMBER *(WHEN USED AS CERTIFICATION REFERENCE)*
	29. "RQ" IDENTIFIES A PSN AS A HAZARDOUS SUBSTANCE		66. CAA NUMBER *(IF REQUIRED BY CAA)*
	30. "WASTE" IS MARKED OR LABELED ON PACKAGE		67. OTHER
	31. "TOXIC" IF NOT INCLUDED AS PART OF DIVISION 6.1 (PG I OR PG II) PSN		LABELING
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	33. "OVERPACK USED" IF OVERPACKED		69. R-RADIOACTIVE MATERIAL LABELS ON OPPOSITE SIDES OF
	34. "LIMITED QUANTITY" OR "LTD QTY"		IF APPLICABLE
			70. SUBSIDIARY RISK LABELS
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	36. SECONDARY HAZARD PSN, CLASS, CLASS OR DIVISION AND NET QUANTITY		72. "MAGNETIZED MATERIAL" *(IF ITEM MEETS DEFINITION)*
	37. HANDLING INSTRUCTIONS		73. "EMPTY" *(IF ITEM MEETS DEFINITION)*
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By Order of the Secretary of the Army:

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