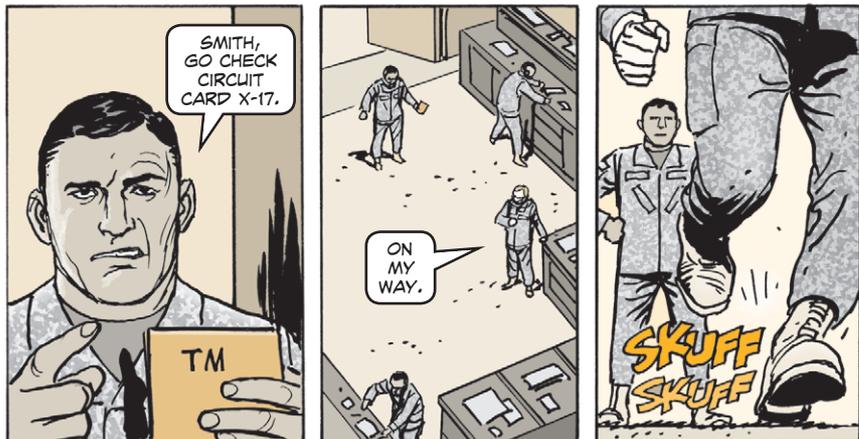


DON'T GIVE 'EM ANY STATIC!



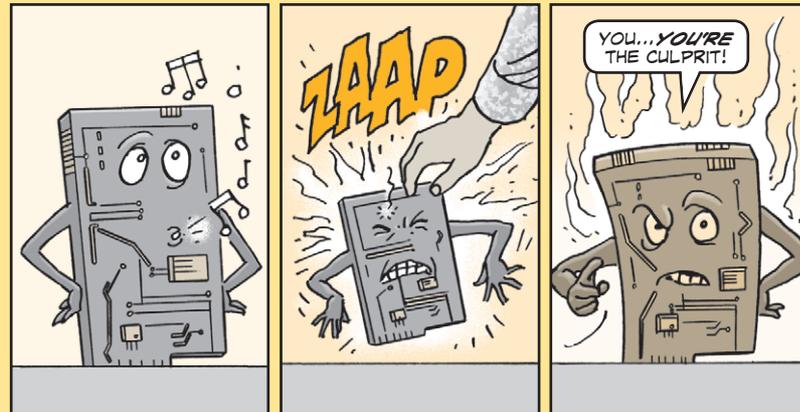
ELECTROSTATIC DISCHARGE (ESD), THE DISCHARGE OF STATIC ELECTRICITY, DESTROYS OR DEGRADES TRANSISTORS, RESISTORS AND INTEGRATED CIRCUITS OF CIRCUIT CARDS.

ESD CAN HAPPEN DURING PACKING, SHIPPING, HANDLING OR INSTALLATION OF CIRCUIT CARDS.

What Causes ESD?

ESD comes from electrically charged objects in your work area: clothing, rugs, chairs, paper, ordinary packaging materials, or the work surface itself.

But the main source of ESD is you!



You build up thousands of volts of static electricity by doing things like walking across the floor or combing your hair. Then, just by touching a circuit card, you'll discharge static electricity, often without realizing it.

A spark as little as 30 volts ruins a sensitive electronic device. You may not feel the discharge or see the damage, but you can bet it has happened. The circuit card may fail now, or be weakened enough to fail later.

Static-safe Workstations

Protect your circuit cards from ESD. Handle them only at a static-safe workstation that includes a grounded static-dissipative table mat, floor mat and wrist strap. They're designed to limit static buildup and carry already-existing charges to ground.

Check with your command for the name of an ESD POC. An ESD POC can recommend the best methods and equipment for your unit.

Here's what's generally available:

NSN 4940-01-250-4236 will bring you a static dissipative table mat, common point ground system, and wrist strap for use in all areas other than clean rooms or laminar flow booths. It also includes small/medium and large/extra large wrist cuffs.



Use a wrist strap!

NSN 4940-01-250-4237 gets you a **portable work surface**, common point ground system, and wrist strap for use where other static control stations are not available. It also includes small/medium and large/extra large wrist cuffs.

NSN 4940-01-253-5368 brings a **field service kit** that has three pouches, MIL-P-81997, type II, NSN 8105-01-356-6365, 13x10-in; three barrier bags, MIL-B-81705, Type I, NSN 8105-01-385-6281, 12x10-in; two wrist straps; one grounding cord and a work surface mat. Instructions for a self-test and how to use the kit are printed on the work-surface mat.



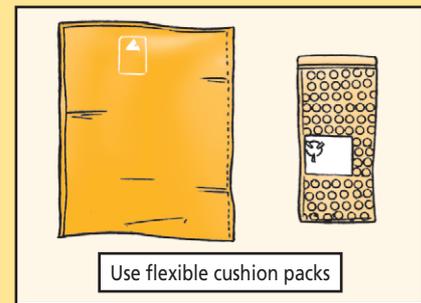
A portable work station can come in handy



Use safe pouches

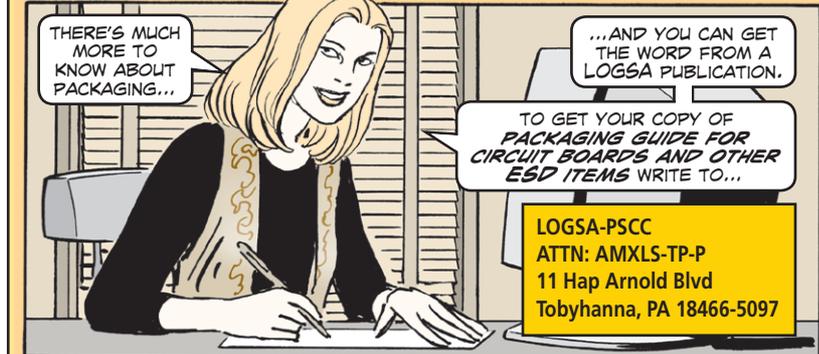
If the piece of electronic equipment is small enough, put it into one of these ESD-free flexible cushion pouches:

| Pouch Size (inches) | NSN 8105-01- |
|---------------------|--------------|
| 12x12 | 197-2965 |
| 11x15 | 215-4752 |
| 10x10 | 197-2966 |
| 10x12 | 197-7846 |
| 8x8 | 215-0462 |



Use flexible cushion packs

Whichever way you go, finish the job with a fast pack. ESD fast packs are NSN 8115-01-019-4084 for 12x18x3¹/₂ inches and NSN 8115-01-057-1244 for 10x10x3¹/₂ inches.

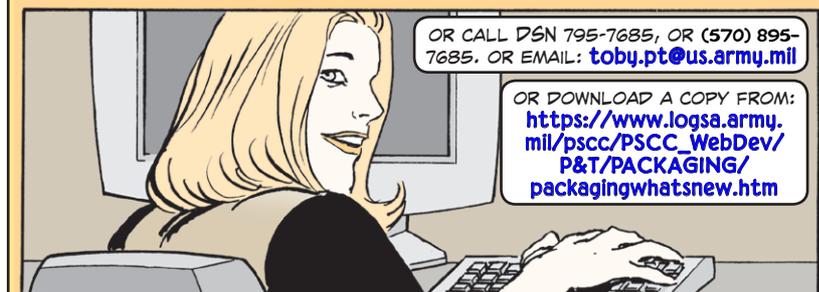


THERE'S MUCH MORE TO KNOW ABOUT PACKAGING...

...AND YOU CAN GET THE WORD FROM A LOGSA PUBLICATION.

TO GET YOUR COPY OF **PACKAGING GUIDE FOR CIRCUIT BOARDS AND OTHER ESD ITEMS** WRITE TO...

LOGSA-PSCC
ATTN: AMXLS-TP-P
11 Hap Arnold Blvd
Tobyhanna, PA 18466-5097



OR CALL DSN 795-7685, OR (570) 895-7685. OR EMAIL: toby.pt@us.army.mil

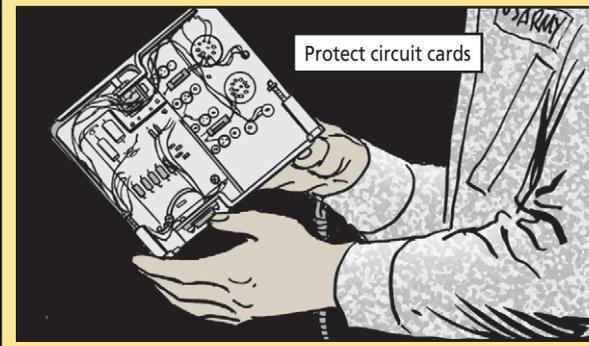
OR DOWNLOAD A COPY FROM:
https://www.logsa.army.mil/pssc/PSCC_WebDev/P&T/PACKAGING/packagingwhatsnew.htm

It's also a good idea to check with your command for the name of an ESD POC. If your command doesn't have one, your electronic repair depot will. An ESD POC can advise you on the latest ESD methods and equipment and recommend the best items for your needs.



IF YOU'RE GOING TO PACKAGE ESD-SENSITIVE (ESDS) CIRCUIT CARDS, HERE ARE A COUPLE OF WAYS TO PROTECT THEM...

First, wrap the cards in anti-static bubble wrap, NSN 8135-01-234-6649, which brings a 500-ft roll from GSA. Then make a bag from static shielding barrier material, NSN 8135-01-185-6816. Heat seal the bag with a hand-held sealer, NSN 3540-00-975-4255. Order it from GSA, too.



Protect circuit cards

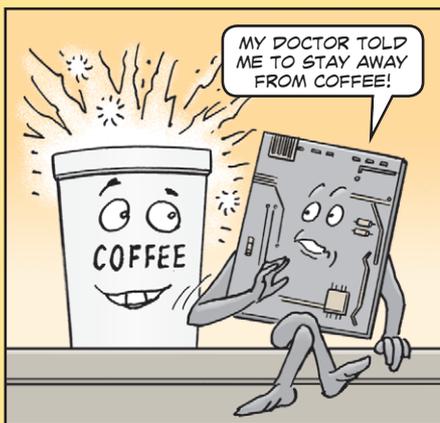


High Charge

The slow discharge path of a workstation can protect your circuit card from discharging conductors such as metal or your body. Unfortunately, they can do nothing against the effect of common highly-charged, non-conducting items. Candy wrappers, folders, paper, Styrofoam cups, cigarette packs, plastic and masking tape, plastics, vinyl, heat guns with blowers and common packing material can have a high static charge which can act over a short distance from an exposed circuit. Keep them away from the work site.



Take for example that Styrofoam cup you left from your last coffee break. It can be a time bomb full of static charge! It could have as much as 20,000 volts charged by your body and can stay charged for hours. A cup as close as a foot away exposes sensitive electronic components to hundreds of volts. Later, when a printed circuit board is reconnected, BAM! That's 300 volts that break down a component. It's zapped by the discharge as surely as if it was touched directly!



A few precautions and regular PM around your workstation will keep high static electricity under control. Keep clutter away. Keep the board protected, even if you know you'll be right back.

If you must have technical manuals and paperwork at the workstation, store them in antistatic bags. Put an ESD-safe rubber band or conductive ESD-safe tape around the bag. Never use ordinary tape or ordinary rubber bands to fasten it. The tape and rubber hold static electricity.

Special things like magnets, radios, tape players and telephones can create an electromagnetic field. Keep them clear of the workstation.



If you must package an item in stretch-wrap or shrink-wrap, do it away from your workstation. Packaging an item with these materials generates static electricity.

Training

People handling ES/DS items should be trained in ESD precautionary procedures. Untrained personnel should never handle ES/DS items when the items are outside the ESD protective packaging.

YOU CAN ENROLL IN A CORRESPONDENCE COURSE ON ELECTROSTATIC DISCHARGE CALLED PACKAGING AND HANDLING OF ELECTROSTATIC DISCHARGE SENSITIVE ITEMS, 90BF60-PT6000, THROUGH THE ARMY INSTITUTE FOR PROFESSIONAL DEVELOPMENT (AIPD).

THEIR WEBSITE IS:
https://www.aimsrdl.atsc.army.mil/secured/accp_top.htm

YOU'LL NEED A PASSWORD TO USE THIS WEBSITE.

Clean Means Safe

Dirt and dust on the table and floor mats act as insulators, making it harder for the mats to carry electrical charges to ground. Clean the mats with a soft cloth, or brush them with a whisk broom.

Use only brushes made with natural bristles, such as horse hair. Brushes made with nylon or other synthetic bristles will generate static electricity.

Never wax or polish the table or floor mats. That leaves a residue that insulates the mats.

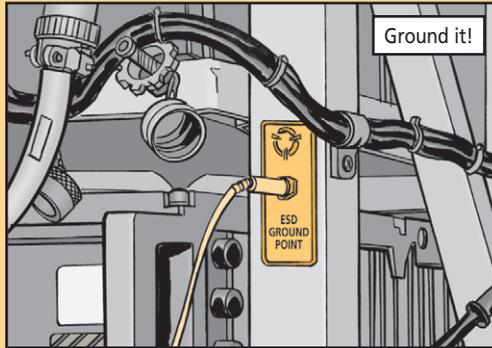


Grounding

Connect table and floor mat grounding cords directly to shop ground. Ground each workstation individually. Never connect workstations in series to ground them.

Make sure your grounding cords are firmly attached to bare metal, not paint.

Wear your wrist strap on your skin, not over your sleeve, or it won't work.



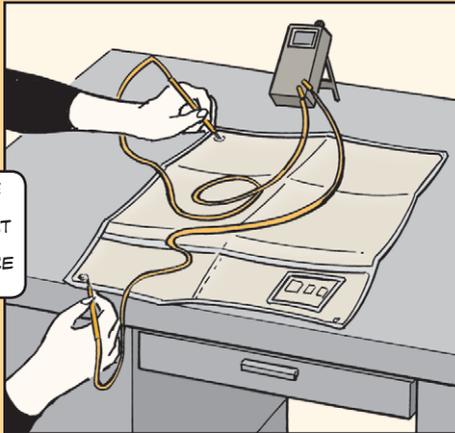
REPLACE
GROUNDING
CORDS IF
THEY'RE
BADLY WORN
OR CUT.



Resistance Checks

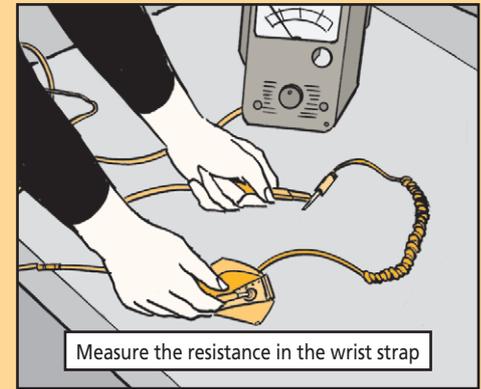
Follow the manufacturer's instructions for measuring the resistance of your workstation components. That's the only way to be sure your workstation's doing its job of carrying static charges to ground.

MEASURE
THE MAT
WITH A MAT
SURFACE
RESISTANCE
TESTER!



Measuring resistance in the wrist strap is especially important. The strap gets more wear and tear than any other part of your workstation. Measure it at least daily.

The wrist strap has a resistor to protect you against high-voltage shocks. If the resistance is too low, the strap can't protect you. Too much resistance means the strap can't draw static electricity away from your body. Either way, you'll need to replace it.



You may want a battery-powered wrist strap tester designed for a quick GO/NO GO test if there are several strap stations to be tested.

Have your workstation tested for resistance from the surface of the table or floor mats to ground. That takes special testing equipment and special support. Contact your local TMDE support folks or C-E LCMC LAR for help.



For more information on ESD protection, see these publications: MIL-HDBK-773, *Electrostatic Discharge Protective Packaging*; DOD-HDBK-263B, *Electrostatic Discharge Control Handbook*; MIL-STD-1686B, *Electrostatic Discharge Control Program*; and MIL-W-87893, *Electrostatic Discharge Control Work Station*.

If you can't find copies locally, order them from the Defense Automated Printing Service, Philadelphia, PA. Just call DSN 442-0159 or (215) 697-0159. Or fax your request to DSN 442-1462, (215) 697-1462.

Another alternative for finding MIL-HDBK-773 is the USAMC Logistics Support Activity website:

https://www.logsa.army.mil/pscc/PSCC_WebDev/P&T/PACKAGING/packagingregs.htm

Updates and new material can be found there, too.