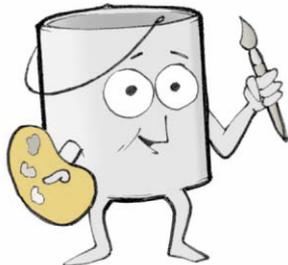


Spot with CARC for a Work of Art



SPOT PAINTING WITH CHEMICAL AGENT RESISTANT COATING (CARC) MAY SEEM A LITTLE COMPLEX.

BUT IF YOU FOLLOW ALL THE INSTRUCTIONS AND SAFETY MEASURES, YOU'LL SOON BE A REGULAR PICASSO.



What is CARC?

CARC is a special type of paint that is resistant to chemical agents. Since it won't soak up chemical agents like alkyd paint does, decontamination is quicker and easier. That means less time spent in MOPP gear for you.

After surface preparation and pretreatment, CARC is applied in two steps. First, the equipment is painted with an epoxy primer. Then it's coated with a polyurethane topcoat.

Most equipment is already painted with CARC. Look for a CARC stencil near the data plate. If you're unsure about your equipment, try this test: Wet a cloth with acetone, NSN 6810-00-753-4780, and rub hard on the painted surface for about 10 seconds to remove any dirt. Then wet another cloth with acetone and rub again. Acetone will remove alkyd paint, but not CARC. So if the cloth is clean, your equipment was painted with CARC.

Use CARC only on CARC-painted equipment. Likewise, only CARC should be used for adding unit identification markings. Using any other type paint over CARC leaves areas where chemical agents will be absorbed. The only way to get rid of the agents is to remove the paint itself.

CARC should not be used on fabric, metals that have anodized finishes (such as small arms) or hoses or other flexible surfaces. It should not be used on exhaust pipes, turbochargers, cooling fins, engines or other surfaces that conduct heat or get above 400°F.

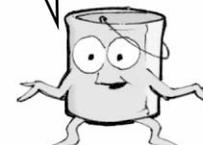
No CARC on hot spots



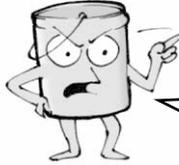
USE THESE HEAT-RESISTANT PAINTS FOR THOSE APPLICATIONS...

NSN 8010	Color	Qty
01-235-4166	Black	1-gal
01-235-4165	Black	1-qt
01-235-2694	Brown	1-qt
01-235-4164	Green	1-gal

NSN 8010	Color	Qty
01-235-2693	Green	1-qt
01-235-2695	Brown	1-gal
00-877-6415	Gray	1-gal
00-616-4009	Olive drab	1-gal



DON'T USE CARC ON WOOD. WOOD EXPANDS AND CONTRACTS WITH CHANGES IN THE WEATHER—CARC DOESN'T.



CARC WILL BEGIN PEELING OFF WOOD SURFACES SOON AFTER APPLICATION.



Before You Start

The first question you should ask is “Does my equipment need spot painting?”

Touch-up painting is done to prevent corrosion, not to make your equipment look better. If the paint is marred, but not deep enough to see bare metal, you don't need to paint.

Once you've decided spot painting is necessary, make sure you provide for your safety. Here's what you'll need:

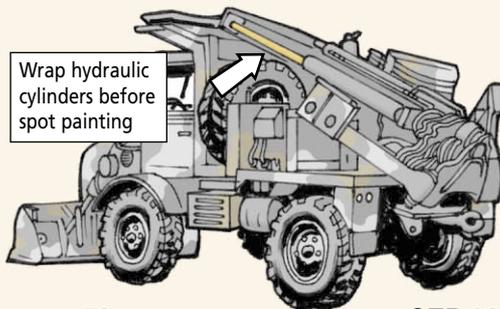
- ✦ **Clothes that cover all your skin.** Coveralls work well.
- ✦ **Boots and rubber gloves.**
- ✦ **Face shield or splash goggles** to protect your eyes from paint and thinner.
- ✦ **Respiratory protection.**

Depending on the conditions and location for spot painting, a respirator may be required. Contact your local occupational safety and health office to perform an evaluation of your work area.



If a respirator is required, they'll do a baseline medical evaluation, fit-test you for the proper respirator and train you in its use.

Next, protect those areas on your equipment that you don't want covered with paint. Use paper or masking tape to cover lights, lenses, windows, data plates, hydraulic cylinder rods, hoses and exposed seals and gaskets that might get splattered when spot painting.



Surface Preparation

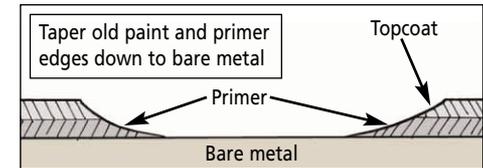
Proper surface preparation is vital before painting with CARC. If you skimp here, the paint won't stick and you'll have to start over.

Follow these steps:

1. Wash the area to be painted with liquid detergent, NSN 7930-00-282-9699, mixed with water. Rinse the area with fresh water and let it dry.
2. Remove all loose paint and rust by hand sanding or with an orbital grinder. Wet sanding will help keep the dust down, but you'll still need to use a high-efficiency respirator and eye protection. Your occupational health and safety office will help you with the right respirator. A vacuum, NSN 7910-01-068-5662, helps with clean up.



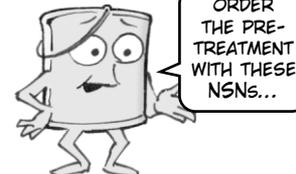
3. Sand the damaged spot down to bare metal using sandpaper or steel wool. Then sand the surrounding paint, tapering up to the topcoat surface. This process is called “featheredging.”



4. As soon as possible, but no more than four hours later to prevent corrosion, clean the area to be painted with thinner, NSN 8010-00-181-8079. Wear gloves. You may also need a respirator, depending on the size of the areas you have to clean and the length of time you will be working. Your occupational health and safety office will help you with the right gloves and respirator.

5. After the thinner has dried, immediately coat all bare metal surfaces with primer pretreatment. This protects the surface and helps the primer bond properly. Keep it off the paint surrounding the bare metal, though. That could keep the primer from bonding to the old paint.

Check with your occupational health and safety office for the right glove to use and to find out if you need to use a respirator.



ORDER THE PRE-TREATMENT WITH THESE NSNs...

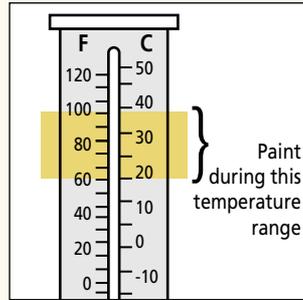
NSN	Size
8030-00-850-7076	1 ½-qt
281-2726	1 ¼-gal
165-8577	5-gal

Let the pretreatment dry at least 30 minutes, but no more than 24 hours to limit the potential for corrosion. Now the surface is ready for priming.

Plan Your Painting

If possible, paint your equipment when the outside temperature is between 60° and 100°F. The ideal temperature is 75-80°F with a humidity of 45-50 percent. CARC will still cure at temperatures below 50°F, but it takes much longer.

Spot paint your equipment in the shade or on an overcast day. Never paint in direct sunlight or when the surface temperature of your equipment is over 100°F. The solvents in the paint evaporate too fast and the CARC won't stick.

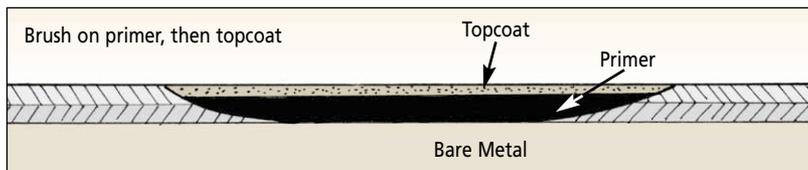
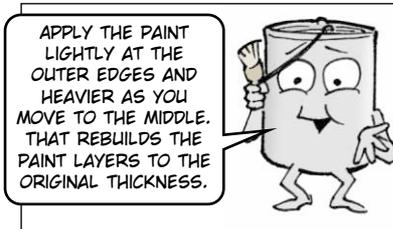
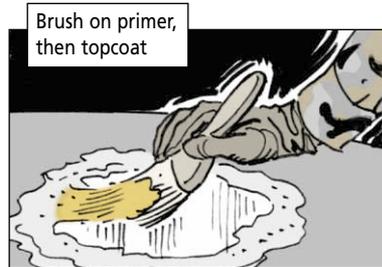


Step-by-Step Touchup

Now you're ready to spot paint your equipment. Follow these steps:

1. Follow the directions that come with the primer to mix only as much as you'll need for that day. Remember, you'll have to dispose of any extra primer because it hardens quickly and can't be reused.
2. When the mixture is uniform, let the primer stand for 30 minutes, then brush it on. Make sure you feather the primer over the edge of the old paint. The primer will harden within 30 to 90 minutes.
3. Stir the container of CARC topcoat thoroughly, then brush it on. Any regular paint brush will do, but here are a few in various sizes:

NSN 8020-00-	Bristle Width (inches)	Bristle Length (inches)
263-3866	1	2
559-9842	1 ½	2 ½
205-6501	2	2 ¾
263-3867	2 ½	2 ½
559-9843	2 ½	3
597-4764	3	3 ¾



After application, CARC goes through a drying process in which the solvent evaporates and the film hardens. Usually the topcoat will be dry to the touch in about 30 minutes and dry enough to walk on in 4-6 hours.

Complete curing takes considerably longer, however. At room temperature (approximately 72°F), it will take 7-14 days for the CARC to completely cure. Cooler temperatures require longer cure times while warmer temperatures require shorter cure times. Do not use the equipment until you're sure the paint is completely cured.



Paint Removal

Even with the best precautions, there will be times you'll need to remove CARC from a surface that can't be scratched or scored—like hydraulic cylinders, cannon mounts, and aircraft surfaces. You won't be able to grind or sandblast without damaging the equipment.

Use epoxy and polyurethane paint stripper to remove CARC in sensitive areas. Wear the gloves and respirator recommended by your occupational health and safety office.

Get the stripper with these NSNs:

NSN 8010-00-	Qty	NSN 8010-00-	Qty
142-9273	1-pt	926-1488	5-gal
181-7568	1-gal	926-1489	55-gal

Be careful where you use the stripper, though. It can damage non-metal surfaces such as plastic and rubber.



Paint Failures

Occasionally, the CARC will not properly adhere to the surface you're painting.



Here are some of the causes...

- ⊛ The surface was not properly prepared. Loose or blistered paint, sanding dust, grease or oil, diesel fuel and even fingerprints are enough to keep CARC from sticking to the surface.
- ⊛ No primer was used. The topcoat was applied to bare metal.
- ⊛ The primer did not have time to dry before the topcoat was applied.
- ⊛ The surface was too hot or cold and the paint didn't have a chance to cure properly.

If the CARC does not adhere to the surface, your only choice is to strip the spot down to bare metal and start over.

Welding CARC-painted Surfaces

Never weld or use a cutting torch on CARC-painted surfaces. Heat releases toxic gases, vapors and metal fumes that can cause lung damage. It can also cause severe eye and skin irritation.

Sand or grind off any CARC paint from both sides of anything you plan to weld. Remove enough CARC so that you have at least four inches of clearance around the area to be welded on both sides.

Wet sanding will help keep the dust down, but you'll still need to use a high-efficiency respirator and eye protection.

Video Help

A training video that shows how to spot paint with CARC is available. Just go to the Joint Visual Information Services Distribution Activity web site at:

<http://dodimagery.afis.osd.mil/dodimagery/davis/>

Click on PIN/ICN Search in the left-hand column. At the next screen, enter 708415 in the PIN number block and click Search. Click on CARC, CHEMICAL AGENT RESISTANT COATING and follow the rest of the instructions to order the video.

You can also order the film by e-mail at vibuddy@hq.afis.osd.mil, or write to:

JVISDA

Warehouse 3/Bay 3

11 Hap Arnold Blvd

Tobyhanna, PA 18466-5120

Include your name, full mailing address, the title and PIN number of the film, format (VHS, for example), and the quantity of tapes you need. APO addresses must include their unit/box number, CMR/box number, or PSC/box number.

Paint NSNs

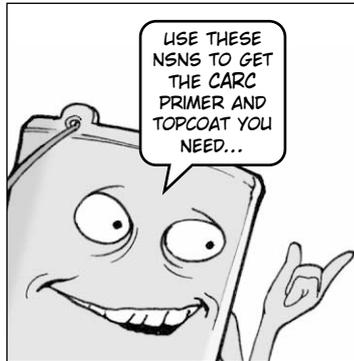
Primer

Color	Kit size	NSN 8010-01-
White*	1 ¼ qt	193-0516
White*	1 ¼ gal	193-0517
White**	1 ¼ qt	193-0519
White**	1 ¼ gal	193-0520
White**	5 gal	193-0521
Light green***	1 qt	218-0856
Light green***	1 gal	218-7354

*Solvent reducible, lead- and chromate-free.

**Water reducible, lead- and chromate-free.

***Water reducible, lead-free, contains chromate.



Topcoat

CARC topcoat is available as two-component and single-component paint. Two-component CARC paint consists of a polymer resin and a curing agent that must be mixed in a four-to-one ratio. That allows you to mix up only as much paint as you need and save the rest for later use.

Single-component CARC already has the curing agent added, so the paint will dry quickly once the can is opened.

Two-Component CARC

Color/ Federal Std No.	1 ¼-Qt Kit NSN 8010-01-	1 ¼-Gal Kit NSN 8010-01-	5-Gal Kit NSN 8010-01-
Brown 383/30051	160-6744	-----	-----
Aircraft red/31136	144-9884	144-9873	-----
Field drab/33105	141-2414	130-3345	-----
Earth yellow/33245	141-2415	130-3346	-----
Sand/33303	141-2416	130-3347	-----
Tan 686A/33446	260-0910	260-0909	260-0908
Aircraft yellow/33538	247-8885	235-8059	-----
Aircraft green/34031	141-2420	131-6255	131-6262
Olive drab/34088	146-2650	055-2319	144-9875
Green 383/34094	160-6741	162-5578	160-6742
Insignia blue/35044	-----	146-2648	-----
Gray/36231	170-7583	146-2649	-----
Aircraft gray/36300	144-9882	127-8908	144-9876
Black/37030	141-2419	131-6254	-----
Aircraft black, interior/37031	144-9886	-----	-----
Aircraft black/37038	144-9885	146-2646	144-9879
Aircraft white/37875	144-9883	144-9872	144-9877

Single-Component CARC

Color/ Federal Std No.	1 Qt NSN 8010-01-	1 Gal NSN 8010-01-	5-Gal NSN 8010-01-	45-Gal NSN 8010-01-
Green 383/34094	229-7546	229-9561	229-7547	232-8514
Brown 383/30051	229-7543	229-7544	229-7545	-----
Black/37030	229-7540	229-7541	229-7542	-----
Sand/33303	234-2934	234-2935	234-2936	-----
Aircraft green/34031	246-0717	246-0718	246-0719	-----
Tan 686A/33446	276-3638	276-3639	276-3640	-----

TM 43-0139, PAINTING INSTRUCTIONS FOR ARMY MATERIEL, SPELLS OUT WHAT COLORS TO USE WITH YOUR EQUIPMENT. IT ALSO CONTAINS A MORE COMPREHENSIVE LIST OF COLORS AND NSNS.

TB 43-0242, CARC SPOT PAINTING, PROVIDES MORE INFO ON TOUCHUP PAINTING.

