



**SHERWIN  
WILLIAMS.**

# Chemical Coatings

CC-M19

## MIL-DTL-64159 Type I Waterborne Polyurethane Chemical Agent Resistant Coating

Aircraft Green 34031 ..... F93G503  
Tan 686A, 33446 ..... F93H503

Green 383, 34094 ..... F93G501  
Catalyst (Component B) ..... V93V502

<u>DESCRIPTION</u>	<u>CHARACTERISTICS</u>	<u>SPECIFICATIONS</u>														
<p><b>MIL-DTL-64159 Type I CARC</b> coatings are two component waterborne polyurethane chemical agent resistant coatings (CARC) for military equipment. They meet the performance and composition of the MIL-DTL-64159 Type I specification.</p> <p><b>Advantages:</b></p> <ul style="list-style-type: none"> <li>VOC of less than 1.55 lb/gal</li> <li>Less than 1.07 lb/gal Volatile Organic Emissions</li> <li>Reduces with water - means considerable cost savings in solvents</li> <li>Low odor</li> <li>Excellent atomization</li> <li>Smooth finish versus standard CARC</li> <li>May be applied with two component equipment</li> <li>Free of lead and chromate hazards</li> <li>May be applied at minimum dry film thickness.</li> </ul> <p>The following products have been approved by U.S. Army Research Lab, Aberdeen Proving Ground, Aberdeen, MD and given the approval codes listed below.</p> <table border="0"> <tr> <td><b>Sherwin-Williams</b></td> <td><b>Approval No.</b></td> </tr> <tr> <td>F93G501</td> <td>Q1632</td> </tr> <tr> <td>F93H503</td> <td>Q1643</td> </tr> <tr> <td>F93B504</td> <td>Q1634</td> </tr> <tr> <td>F93N504</td> <td>Q1633</td> </tr> <tr> <td>F93G503</td> <td>Q1652</td> </tr> <tr> <td>V93V502</td> <td></td> </tr> </table> <p>Not Stocked - Special Order Only: Black, 37030 ..... F93B504 Brown 383, 30051 ..... F93N504</p>	<b>Sherwin-Williams</b>	<b>Approval No.</b>	F93G501	Q1632	F93H503	Q1643	F93B504	Q1634	F93N504	Q1633	F93G503	Q1652	V93V502		<p><b>Gloss:</b></p> <p>60° 1.5 unit maximum 85° 4.0 units maximum</p> <p><b>Volume Solids:</b> varies by color Component A: 35-39% Component B: 69.3 ±1% Admixed: 46-49%</p> <p><b>Viscosity:</b> varies by color 12-25 seconds #3 Zahn Cup catalyzed and reduced</p> <p><b>Recommended film thickness:</b> Mils Wet 3.8 - 4.9 Mils Dry 1.8-2.3</p> <p><b>Spreading Rate</b> (no application loss) 321-437 sq ft/gal @ 1.8-2.3 mils DFT</p> <p><b>Drying</b> (77°F, 50% RH): Set to Touch: 30 minutes Dry Hard: 4 hours Dry Through: 6 hours Complete Cure: 7 days Force Dry: flash 1 hour, then dry 45 minutes at 180°F. Flash time is dependent on air movement, humidity and temperature. The one hour flash can be reduced with an air dehydrator or fans to help remove the water.</p> <p><b>Flash Point:</b> none, Pensky-Martens Closed Cup</p> <p><b>Mixing Ratio:</b> 2 part Component A 1 part Component B V93V502 Reduction rate varies by color. See application section for details.</p> <p><b>Pot Life:</b> 4 hours <b>Package Life:</b> 12 months, unopened</p> <p><b>Air Quality Data:</b> Non-photochemically reactive Volatile Organic Compounds (VOC) Component A as packaged, maximum 1.2 lb/gal, 141 g/L Component B as packaged, maximum 2.2 lb/gal, 266 g/L catalyzed and reduced as above, maximum 1.55 lb/gal, 185 g/L Volatile Organic Emissions Component A as packaged, maximum 0.49 lb/gal, 58g/L</p> <p>An Environmental Data Sheet is available from your local Sherwin-Williams facility.</p>	<p><b>Steel:</b> Surface must be clean and free of grease, dirt, oil, rust, fingerprints, and other contaminants to insure optimum adhesion and performance properties. Chemical pretreatment, (zinc phosphate) or DOD-P- 15328D Wash Primer, E90G4, gives best adhesion and performance results. Where blasting is appropriate, blast in accordance with SSPC-SP6. For optimum adhesion pretreat blasted surface. Prime with wash primer E90G4 within two hours after blasting.</p> <p><b>Aluminum:</b> Clean with acidic cleaner or other appropriate cleaner depending on contamination. Pretreat with chromate conversion coating MIL-DTL-5541F, Wash Primer DOD-P-15328D, E90G4, or anodize per MIL-A-8625F. See below for primers.</p> <p><b>Galvanized and other metals:</b> Clean and remove oxidation contamination on surface, followed by treatment with DOD-P-15328D wash primer, E90G4. Due to the variability in these surface, testing adhesion on each situation is recommended. See below for primers.</p> <p><b>Primers must be applied under the CARC topcoat.</b> For <b>ferrous</b> substrates, use MIL-DTL-53022C primer, e.g. E90W201 (Type I) or E90H226 (Type II, faster recoat) or MIL-DTL-53030B primer, E90W501. For <b>non-ferrous</b> substrates, MIL-PRF-23377J, E90G203 (Type I, Class C2, 2.8 VOC); MIL-DTL-53022C (see above); or MIL-DTL-53030B, E90W501.</p> <p>Check the data sheet of each primer for recoat time of topcoat, e.g. E90H226 can be topcoated in 20-30 minutes air dry.</p> <p>Note: See MIL-DTL-53072C for details.</p> <p><b>Testing:</b> Due to the wide variety of substrates, surface preparation methods, application methods, and environments, the customer should test the complete system for adhesion and compatibility prior to full scale application.</p>
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## APPLICATION

### Typical Setups

#### Special Mixing Instructions:

Component A should be shaken 5 minutes on Red Devil type shaker before opening. Mix Component B into Component A for 3 minutes using a mechanical mixer. (Tan F93H503 may have a skin on the surface prior to shaking. Simply shake the material for 5 minutes to incorporate the skin.) Sherwin-Williams highly recommends the use of a cage mixer. An air drill capable of 2000 rpm is also a necessity. Contact your Sherwin-Williams representative for an initial demonstration. The viscosity of the admixed components increase. Reduce to spray (see rates below), then mix well.

**Reduction:** Reduce with deionized or distilled water at the specific reduction rate listed below for each color:

F93G501	2:1:0.6
F93H503	2:1:0.7
F93B504	2:1:0.4
F93N504	2:1:0.7
F93G503	2:1:0.6

#### Conventional Spray:

Air Pressure ..... 45-60 psi  
Tip ..... .070"

#### Air Assisted Airless:

Air Pressure ..... 50 psi  
Fluid Pressure ..... 2100 psi  
Tip ..... 611

#### HVLP:

Air Pressure ..... 65 psi  
Fluid Pressure ..... 5-10 psi  
Tip ..... .070"

#### Cleanup:

Clean tools/equipment immediately after use with water.

Then flush equipment with MIL-T-81772, Type I Thinner, R91K20, to prevent rusting. Another method is the use of Acrastrip® 600 BIG MOD (Military) manufactured by Polychem, U.S. patent #5,972,865.

Follow manufacturer's safety recommendations when using any solvent.

## SPECIFICATIONS

#### Product Limitations:

- These coatings (Component A) must be catalyzed with Catalyst (Component B), V93V502, at 2:1 ratio by volume.
- Do not use other catalysts or isocyanates other than V93V502. Do not vary catalyst mixing ratio.
- Reduction rate varies by color. See application section.
- Component A must be well agitated prior to use by using a Red Devil type shaker.
- Component A, Component B, and Reducer must be mixed with a squirrel cage mixer and air drill or using proper two component equipment.
- Potlife will be shorter under warmer temperature.
- Force curing prior to the water evaporating will result in a soft film. However, after seven days, full cure will be obtained.

#### Performance Properties:

Meets all the performance properties of MIL-DTL-64159, Type I.

#### CAUTION:

**Admixed material should not be discarded in sealed drums. Vented plugs should be used on the drums. This material will generate carbon dioxide gas within the first 24 hours of being mixed. After the material has been mixed for 24 hours, the gas is no longer emitted and the drums can be sealed.**

**Note:** Product Data Sheets are periodically updated to reflect new information relating to the product. It is important that the customer obtain the most recent Product Data Sheet for the product being used. The information, rating, and opinions stated here pertain to the material currently offered and represent the results of tests believed to be reliable. However, due to variations in customer handling and methods of application which are not known or under our control, The Sherwin-Williams Company cannot make any warranties as to the end result.

## CAUTIONS

Thoroughly review product label for safety and cautions prior to using this product.

A Material Safety Data Sheet is available from your local Sherwin-Williams facility. Please direct any questions or comments to your local Sherwin-Williams facility.

#### LABEL CAUTIONS

SEE CONTENTS STATEMENT ON LABEL.

CONTAINS MATERIAL THAT MAY CAUSE ADVERSE REPRODUCTIVE EFFECTS AND MAY ADVERSELY AFFECT THE DEVELOPING FETUS BASED ON ANIMAL DATA.

Use only with adequate ventilation. To avoid overexposure, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches, or dizziness, increase fresh air, or wear respiratory protection (NIOSH approved) or leave the area.

Adequate ventilation required when sanding or abrading the dried film. If adequate ventilation cannot be provided wear an approved particulate respirator (NIOSH approved). Follow respirator manufacturer's directions for respirator use.

Avoid contact with eyes and skin. Wash hands after using. Keep container closed when not in use. Do not transfer contents to other containers for storage. FIRST AID: In case of eye contact, flush thoroughly with large amounts of water. Get medical attention if irritation persists. If swallowed, call Poison Control Center, hospital emergency room, or physician immediately.

SPILL AND WASTE: Remove all sources of ignition. Ventilate and remove with inert absorbent. Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulation regarding pollution.

DELAYED EFFECTS FROM LONG TERM OVEREXPOSURE.

Abrading or sanding of the dry film may release crystalline silica which has been shown to cause lung damage and cancer under long term exposure.

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

DO NOT TAKE INTERNALLY. KEEP OUT OF THE REACH OF CHILDREN.

FOR INDUSTRIAL USE ONLY.

SEE MATERIAL SAFETY DATA SHEET. 27039-010507.

Catalyst CONTAINS ISOCYANATES. People who have chronic (long-term) lung or breathing problems or have had a reaction to isocyanates, must not be in the area where this product is being applied. Where overspray is present, a positive pressure air-supplied respirator should be worn. If unavailable, a properly fitted organic vapor/particulate respirator may be effective. Consult catalyst MSDS and product label for complete handling instructions.