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**MIL-DTL-64159 TY I**  
**WATER BORNE CAMOUFLAGE**  
**ALIPHATIC POLYURETHANE (CARC)**  
**CHEMICAL AGENT RESISTANT COATING**

**DESCRIPTION**

This coating is a two component water base polyurethane finish, approved by Army Research Laboratory for use by all departments and agencies within the Department of Defense. Primary applications include the finishing of military vehicles, apparatus, and all forms of ground support equipment. Exhibiting an excellent balance of chemical and physical properties; cured films remain tough and durable for both interior and exterior use. The coating is resistant to live agent, and meets or exceeds the requirements of MIL-C-46168D and MIL-C-53039A. A practical answer to the application problems of high solids finishes, this coating system has a V.O.C. of 1.8 lbs/gal or less and is non-flammable.

**ADVANTAGES**

- HAPS Free
- Excellent Physical & Chemical Resistance
- Exterior Durability
- Excellent Recoatability
- Compatible with Standard Military Pre-Treatments & Primers
- Easy Water Clean Up
- Minimal Isocyanate Hazard
- Lead & Chromate Free
- Smooth Finish

**PHYSICAL PROPERTIES**

**Gloss:** 60° 1% Max.  
85° 3.5 % Max.

**Pot Life:** 4 Hours

**Volume Solids:** Varies by Color  
Admixed: 45-48%

**Recommended Film Thickness:**  
1.8 — 2.3 mils

**Coverage:** No Application Loss  
225-340 sq.ft./gal @ 1.8-2.3 mils DFT

**Dry Times:** (77°F, 50% RH)  
To Touch: 45-60 mins  
Hard: 4-6 Hours  
Handle: 6-8 Hours  
Recoat: 8-10 Hours

**Air Quality:** VOC  
Less than or equal to 1.8 lbs. / gallon, minus water

**Flexibility:**  
1/8" Mandrel 180° Bend: PASS

**Weathering:**  
QUV > 1000 Hours  
Xenon Weatherometer: > 2000 Hours

**Chemical Resistance:**  
Meets or Exceeds Specification Requirements  
Water: 168 Hours Immersion  
Hydrocarbon TT-S-735 Type III:  
168 Hours Immersion  
10% Acetic Acid: 1 Hour Spot Test  
Super Tropical Bleach (STB)  
Live Agents

**Shelf Life:** (50-80°F, ~50% R.H.)  
1 Year from DOM, Unopened

**Mix Ratio:** (by volume)  
Component A 2 Parts  
Component B 1 Part  
Deionized Water 1/2 Part  
Water reduction may vary by color.

**QUALIFIED COLORS**

<u>FS595</u>	<u>Color</u>	<u>Spectrum #</u>
30051	Brown 383	WU2K-455
33446	Tan 686A	WU2K-456
34094	Green 383	WU2K-453
36300	Aircraft Gray	WU2K-563
37030	Black 383	WU2K-454
37038	Aircraft Black	WU2K-454

**APPROVED PRIMERS**

- MIL-PRF-23377 High Solids Epoxy
- MIL-P-53022B TY I & II Epoxy
- MIL-P-53030 Water Reducible Epoxy
- MIL-PRF-85582 Waterborne Epoxy
- MIL-P-53084 Cathodic Electrodeposition

**APPROVED PRETREATMENTS**

- MIL-A-8625 Anodizing Coating
- DOD-P-15328 Green Wash Primer
- MIL-C-8514 Wash Primer
- TT-C-490 Zinc Phosphate
- MIL-C-5541 Chromate Conversion

Chemical Agent Resistant Coating (CARC) System Application Procedures and Quality Control Inspection specification **Mil-DTL-53072C** should be referenced for proper cleaning, pretreatment and priming of different substrates.

## CLEANING, PRETREATING & PRIMING

**Cleaning:** Surfaces must be clean and free from dirt, dust, rust, oil, finger marks, and other contaminants. Improperly cleaned surfaces can limit or interfere with paint adhesion, causing subsequent paint loss in service, which will affect physical performance of coating and leave the substrate unprotected from the environment. Unless otherwise specified, the surface should be thoroughly cleaned according to TT-C-490.

**Steel:** Where blasting is appropriate, blast in accordance with Steel Structures Painting Council (SSPC) Specification SSPC-SP-6 to remove millscale, products of corrosion, dirt, casting, sand, slag, and other foreign substances. Blast-cleaned surfaces that are to be pretreated with wash primer shall be chemically treated within four hours and dried for at least one hour at 70°F to ensure completeness of the chemical reaction prior to application of a primer.

**Aluminum:** Depending upon contamination, clean with acidic cleaner or other appropriate cleaner. Pretreat with chromate conversion coating (Mil-C-5541), DOD-P-15328 Wash Primer (Spectrum # GWP-421), or anodize per Mil-A-8625.

**Repainting CARC Urethane:** Mil-DTL-64159 has been formulated to recoat Mil-C-53039, Mil-C-46168 and Mil-DTL-64159 CARC coatings. To properly recoat, scrape any flaking or peeling coating. Sand blast if necessary per SSPC-SP-6. Sand to uniform surface. Properly prime bare metal areas. Topcoat with Mil-DTL-64159.

**Primers:** This coating requires an epoxy primer.

**Ferrous Substrate:** Mil-P-53022B, Mil-P-53030 or Mil-P-53084.

**Non-Ferrous Substrate:** Mil-P-53022B, Mil-PRF-23377J, Mil-P-53030, MIL-PRF-85582D or Mil-P-53084.

## MIXING

### **Mix Ratio: (by volume)**

Component A	2 Parts
Component B	1 Part
Deionized Water	1/2 Part

Always mix Part B into Part A using **vigorous mechanical agitation** (ie: Jiffy mixer) to insure the proper incorporation of both components.

Use a 4" dispersion blade when mixing 1.5 gallon or larger quantities and a 2" blade when mixing smaller batches. Your drill must have at least 1000 RPM to get proper shearing action of materials. A paint shaker can be used in conjunction with the dispersion blade mixer, but the use of a shaker alone **does not** properly mix Part A, or Parts A & B together.

### **Proper Mixing Instructions:**

1. Using dispersion blade, stir contents of Part A until completely blended.
2. Pour Part A into mixing container.
3. While stirring Part A, create a whirlpool effect and **slowly** pour the appropriate quantity of Part B in. **Never pour Part B into Part A while not stirring!**
4. Mix for at least 5 minutes, the mixture will get thick like wallpaper paste when properly blended.
5. Let mixed material stand for 5 minutes. Pour in appropriate quantity of Deionized Water, but only after Part A and Part B have been properly mixed together. Never pour water directly into Part A or B, or unmixed A & B.
6. Mix for 5 minutes.
7. Mixture is now ready to spray!

**Water Reduction:** Always use Deionized Water to thin the coating. Thinning ratio may vary depending upon temperature, humidity, spray equipment, application and color. Water reduction ratio can vary from a minimum of 1/4 part to a maximum of 5/8 Parts.

## APPLICATION

Spray application can be accomplished with one full wet coat. To obtain specification performance properties, it is necessary to apply the coating to a dry film thickness of 1.8 - 2.2 mils. When applying, do not exceed 6 - 7 wet mils due to the possibility of blistering with excessive one coat wet film builds.

## **Conventional Spray**

- Air Pressure 45-60 psi
- ### **HVLP**
- Air Pressure 65 psi
  - Fluid Pressure 8-15 psi
- ### **Air Assisted Airless**
- Air Pressure 50 psi
  - Fluid Pressure 2100 psi

Tip size can vary depending upon desired spray pattern, size of gun and desired flow rate.

## CLEANUP

Clean tools, mixing/spray equipment immediately after use with warm water. After warm water rinse, flush equipment with Isopropyl Alcohol or Acetone.

## CURING

### **Production Applications:**

- **Air Dry** (77°F, 50% R.H.)
  - To Touch: 45-60 mins
  - Hard: 4-6 Hours
  - To Handle: 6-8 Hours
  - Recoat: 8-10 Hours
- **Force Dry**
  - To Handle:
    - Allow sprayed part to air dry for 2-4 hours @ ~77°F before force drying @:
      - 150° F 2 Hours or
      - 200° F 1 Hour

**For packaging, allow parts to dry overnight for both air and force drying.**

### **Quality Control—Test Curing:**

- **Air Dry** (77°F, 50% R.H.)
  - Allow 7-10 Days before Testing
- **Force Dry**
  - Air Dry for 4 Days then
  - Force Dry 24 Hrs @ 225°F then
  - Allow to Air Dry for 24 Hrs before Testing

## PRODUCT LIMITATIONS

Do not vary catalyst ratio, this material has been formulated to achieve its optimum performance properties at listed ratios. Do not heat while applying, mixing, or storing. Heat shortens the pot life and shelf life of the materials. Protect all Spectrum Polyurethane products from moisture, heat, and store inside in ambient conditions. Temperature and humidity will effect drying times, cure rate, and color.

All recommendations, statements, and technical data contained herein are based upon tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as a warranty, either expressed or implied. User shall rely on his/her own information and tests to determine suitability of the product for the intended use and assumes all risks and liability resulting from his/her use of the product.