

METRIC

A-A-50542A  
May 13, 1994  
SUPERSEDING  
A-A-50542  
February 18, 1993

#### COMMERCIAL ITEM DESCRIPTION

##### COATING SYSTEM: REFLECTIVE, SLIP-RESISTANT, CHEMICAL-RESISTANT URETHANE FOR MAINTENANCE FACILITY FLOORS

The General Services Administration has authorized the use of this commercial item description.

Abstract. This commercial item description (CID) covers the liquid components of a reflective, chemical-resistant urethane (CRU) floor coating system, to be applied with appropriate grit, to provide a slip-resistant surface for maintenance facilities, and for light-duty service in aircraft hangars. The system is designed to be used as a 4-coat, 230- to 305-micrometers (9.0- to 12.0-mils) total dry film thickness (DFT) surfacing for concrete substrates. Porous, rough, or damaged areas may require an added material to give the smooth base requisite to a highly reflective surface. A wear layer of 3 CRU coats of 65 to 75 micrometers (2.5 to 3.0 mils) each is required.

Salient characteristics.

##### Materials

Primer - 2-component epoxy primer

Resurfacer or repair material - epoxy, for porous, rough, or damaged areas only, with or without aggregate, as required; 100 percent solids

CRU topcoat - 2-component aliphatic polyester urethane topcoat

Striping paint - CRU topcoat material, in specified colors

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer (Code 156), Naval Construction Battalion Center, 1000 23rd Avenue, Port Hueneme, CA 93043-4301.

FSC 8010

## A-A-50542A

Mixed Primer Components	Value	Test Method
Nonvolatile content, volume percent (minimum)	33	ASTM D 2697
Viscosity of mixed material, 25 degrees C, pascal second (cP)	0.1-1.0 (100-1000)	ASTM D 2196
Pot life, minutes (minimum)		ASTM D 2196 (a)
13 degrees C	60	
25 degrees C	45	
32 degrees C	30	
Dry-to-topcoat time, hours (minimum recoat time) (b)		ASTM D 1640
13 degrees C	18	
23 degrees C	6	
32 degrees C	4	
VOC content, grams per liter of coating less water (maximum)	420	ASTM D 3960
<u>Topcoat Polyester Component</u>		
Phthalic anhydride, weight percent of nonvolatile vehicle	28-42	ASTM D 2698, ASTM D 563
<u>Topcoat Isocyanate Component</u>		
Presence of aliphatic isocyanate identified	present	MIL-C-46168 (c)
Absence of aromatic bands	none detected	MIL-C-46168 (c)
<u>Mixed Topcoat Components</u>		
Nonvolatile content, volume percent (minimum)	50	ASTM D 2697
Viscosity of mixed material, 25 degrees C, pascal second (cP)	0.075-0.80 (75-800)	ASTM D 2196
Pot life, minutes (minimum)		ASTM D 2196 (a)
13 degrees C	45	
25 degrees C	30	
32 degrees C	15	
Dry-to-recoat time, hours (minimum recoat time) (b)		ASTM D 1640
13 degrees C	16	
23 degrees C	12	
32 degrees C	10	
VOC content, grams per litre of coating less water (maximum)	420	ASTM D 3960
<u>Cured Topcoat (d)</u>		
Flexibility, 3.2-mm (1/8-inch) diameter mandrel	pass	ASTM D 1737
Knife test: film ribbon or curl, and beveled edge of cut	pass	FED-STD-141, Method 6304
Hardness, KHN (minimum)	as supplied	ASTM D 1474, Method A

## A-A-50542A

Cured System, Less Grit and Striping(e)	Value	Test Method
Reflectance, CIE illuminant D <sub>65</sub> , 400-700 nanometer wave length range, percent (minimum)		ASTM E 1164
White	92	
Light gray	as supplied	
Dark gray	as supplied	
Tan	as supplied	
Gloss, 60 degrees (minimum)	90	ASTM D 523
Chemical resistance: spot test, covered, 7-day exposure: Skydrol 500B-4, JP-5, MIL-H-83282, and DOT-3 fluids:		ASTM D 1308(f)
Visible and tactile effects	none	
Pencil gouge hardness, units change (maximum)	2	ASTM D 3363(f)
Fluid resistance: MIL-L-23699 at 121 degrees C, MIL-H-83282 at 66 degrees C; 24 hours: No blistering, softening, dark staining, or other film defects	pass	note(g)

## Full System

Liquid materials, including striping paints, shall exclude halogenated solvents, hexavalent chromium, lead, mercury compounds, and ACGIH A1 human carcinogens and A2 suspected human carcinogens. The applied system shall be products from one manufacturer, designed to be used together and warranted as a system by the supplier or vendor.

(a) Determine the time when the viscosity has increased 50 percent from the viscosity measured immediately after mixing.

(b) Earliest recoat times shall not exceed times shown. See manufacturer's instructions for maximum recoat times.

(c) Record the infrared spectrum of the vacuum dried isocyanate component as specified. The spectrum shall be essentially as depicted in figures 1 through 1c, spectra of two different forms of the polymeric aliphatic isocyanate based on hexamethylene diisocyanate.

(d) Prepare 65-micrometers (2.5-mils) DFT films for the flexibility and hardness tests, and cure the panels 7 days. Use a strong light and 7x magnification for the flexibility test examination. Use the flat portion of the panel from the flexibility test for the knife test.

(e) Prepare specimens of the full system, by application as recommended by the manufacturer, within the DFT ranges given in the abstract, above, except as noted following: For the chemical resistance tests, use a full-system specimen, a panel coated only with a single 50-micrometers (2.0-mils) DFT coat of primer, and panels coated only with single 125- to 380-micrometers (5- to 15-mils) coats of resurfacer or repair materials, if used. Cure all specimens 7 days.

(f) For the tests of pencil hardness change, use A.W. Faber Castell 9000 or Staedtler Mars Lumograph 100 pencils or leads, utilizing the same operator, and the same pencils or leads used for the initial determination, for the repeat, after-exposure determination. Inspect panels immediately after exposures for any observable defects. Then clean the panels and test the exposed areas for pencil gouge hardness. Clean by wiping with lint-free paper towels or cloth, and then washing quickly in a 25 percent solution of MIL-C-87936, Type I detergent, or equivalent, rinsing in distilled water, and drying with clean, lint-free paper towels or cloth. Complete cleaning and

A-A-50542A

testing within one hour after removal of the watch glasses.

(g) Immerse two test panels of the full system, with specimen edges coated with fluid-resistant material, separately for 24 hours in MIL-L-23699 lubricating oil at 121 degrees +/- 3 degrees C and MIL-H-83282 hydraulic fluid at 66 degrees +/- 3 degrees C. Four hours after removal, examine the coatings. Slight staining is acceptable.

Quality assurance.

Responsibility. Unless otherwise specified, the contractor is responsible for the performance of all inspection requirements specified herein, using facilities approved by the Government. The Government reserves the right to perform any of the inspections set forth when deemed necessary to assure that the material conforms to prescribed requirements.

Records. Records of examinations and tests performed by or for the contractor shall be maintained by the contractor and made available to the Government, upon the Government's request, at any time, or from time to time, during the performance of the contract and for a period of three years after delivery of the supplies to which such records relate.

Inspections. Sampling shall be in accordance with ASTM D 3925. Failure to meet any requirement shall be cause for rejection of the lot from which the sample was taken.

1. First article inspection, when specified, shall include all tests of salient characteristics, and may be standard production material from the supplier's current inventory.

2. Quality conformance inspection, when specified, shall include the tests of the mixed primer components, the polyester and isocyanate components, and the mixed topcoat components, or other testing as specified.

Certification. The contractor shall certify, and maintain substantiating evidence, that the products offered meet the requirements of this CID, and that the products conform to the producer's own drawings, specifications, standards, and quality assurance practices. The Government reserves the right to require proof of such conformance prior to first delivery and thereafter as may be otherwise provided for under the provisions of the contract.

Packaging. Materials shall be packaged and marked as specified in ASTM D 3951. The manufacturer of the system shall provide instructions for application over concrete, and steel when required, and shall include information regarding incorporation of grit to achieve varying levels of slip-resistance. If application is not included as part of the procurement, instructions shall be sufficiently detailed and complete to assure a proper installation for the system performance guarantee. Material Safety Data Sheets shall be submitted in accordance with FED-STD-313.

A-A-50542A

## Notes.

Note 1. Specifiers should select other systems for new construction and for heavy-duty operations, or when limited maintenance or repair services are available. White CRU and white grit should be considered for any hangar installations. Joint sealant requirements should be included in procurement documents.

Note 2. For Navy applications, refer also to proposed NFGS-09921 for development of procurement requirements.

## Note 3. Suggested sources:

Sources	Model Numbers
Crawford Laboratories 4165 S. Emerald Ave. Chicago, IL 60609	White Aqua Prime Epoxy MI-028/UO-863 Florock CRU 1100, White; CRU 2100, Lite Grey
Garland Floor Company 4500 Willow Parkway Cleveland, OH 44125	Chemi-Cote SRVOC (primer), clear or pigmented Chemi-Cote UR-5000, clear, white, and colors
General Polymers Corporation 145 Caldwell Drive Cincinnati, OH 45216	Epoxy Primer 3476, clear High Solids Polyurethane Enamel, 4618, white and colors
Lord Corporation Industrial Coatings 2000 West Grandview Blvd. P.O. Box 10038 Erie, PA 16514-0038	Chemglaze 9863 Waterborne Epoxy, white; 9862, clear Chemglaze CRU K6207 white; clear, and colors
Tennant Company P.O. Box 1452 Minneapolis, MN 55440	Waterborne Epoxy 406 CRU White (4706); clear (4700), and light gray (4707)

Other model numbers and other suppliers may meet system requirements.

## Note 4. Document sources:

American Conference of Governmental Industrial Hygienists (ACGIH), 6500 Glenway Avenue, Bldg. D-7, Cincinnati, OH 45211.

ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

Government documents: Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

A-A-50542A

Note 5. Ordering data:

1. Colors of primer, topcoat, and striping paints.
2. Hardness value, if required.
3. Reflectance values, if required, for other than white topcoats.
4. Sample specimen of the full system, including grit as required to provide specified level of slip resistance.
5. Location of commercial or government sites where installed systems can be inspected.
6. Length and terms of warranty, if required for material procurements.
7. First article inspection, if required.
8. Quality conformance inspection tests, if required, and other testing if specified.
9. Instructions for application over steel, if required.

Note 6. Key word listing:

Aircraft hangars  
Grit  
Striping paint

MILITARY INTERESTS:

Custodians

Army - ME  
Navy - YD1  
Air Force - 99

Review activities

Army - CE  
Navy - AS, MC, SH  
Air Force - 84

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

PREPARING ACTIVITY:

Navy - YD1

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