

INCH-POUND

MIL-PRF-6799L  
03 September 2010  
SUPERSEDING  
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14 September 1998

## PERFORMANCE SPECIFICATION

### COATINGS, SPRAYABLE, STRIPPABLE, PROTECTIVE, WATER EMULSION

This specification is approved for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 Scope. This specification establishes the performance requirements for water emulsion, protective, strippable, sprayable, coatings for application over metallic, painted, and plastic surfaces.

1.2 Classification. The coatings are furnished as the following type and classes as specified (see 6.2).

1.2.1 Type. The type of coating is as follows:

Type II - Multi-coat system - Exterior (see 3.2.1)

1.2.2 Classes. The classes of coatings are as follows:

Class 1 - Basecoat (black)  
Class 1A - Basecoat (black) non-chromate  
Class 5 - Topcoat (white or olive drab)  
Class 6 - Topcoat (white)  
Class 6A- Topcoat (white) non-methanol  
Class 7 - Topcoat, brushable (see 3.2.1.2)

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547, Lakehurst, NJ 08733-5100 or emailed to [michael.sikora@navy.mil](mailto:michael.sikora@navy.mil). Since contact  
information can change, you may want to verify the currency of this address information  
using the ASSIST Online database at <https://assist.daps.dla.mil>.

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## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

## FEDERAL SPECIFICATIONS

P-P-560	-	Polish, Plastic.
TT-N-95	-	Naphtha, Aliphatic.

## FEDERAL STANDARD

FED-STD-595	-	Color number 36440 – Gray, Flat or Lusterless.
FED-STD-595	-	Color number 24084 – Green, Semigloss.

## COMMERCIAL ITEM DESCRIPTION

A-A-857	-	Thinner, Dope and Lacquer (Cellulose Nitrate).
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## DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-5425	-	Plastic Sheet, Acrylic, Heat Resistant.
MIL-C-8514	-	Coating Compound, Metal Pretreatment, Resin-acid.
MIL-PRF-22750	-	Coating, Epoxy, High-Solids.
MIL-PRF-23377	-	Primer Coatings, Epoxy, High Solids.
MIL-PRF-81352	-	Coating, Aircraft Touch-up.
MIL-T-81772	-	Thinner, Aircraft Coating.
MIL-PRF-85285	-	Coatings, Polyurethane, Aircraft and Support Equipment.

(Copies of these documents are available online at <https://assist.daps.dla.mil/quicksearch/> or <https://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

### CODE OF FEDERAL REGULATIONS

#### DEPARTMENT OF TRANSPORTATION

##### Title 49-Transportation, Parts 100-199

(Copies of these documents are available online at <http://www.gpoaccess.gov/cfr/index.html> or from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

#### AMERICAN SOCIETY FOR QUALITY (ASQ)

ASQ-Z1.4 - Sampling Procedures and Tables for Inspection by Attributes. (DoD adopted)

(Copies of this document are available from [www.asq.org](http://www.asq.org) or the American Society for Quality, 600 Plankinton Avenue, Milwaukee, WI 53203.)

#### ASTM INTERNATIONAL

ASTM-D2369 - Coatings, Volatile Content of. (DoD adopted)

(Copies of these documents are available from [www.astm.org](http://www.astm.org) or ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

#### SAE INTERNATIONAL

SAE-AMS-QQ-A-250/5 - Aluminum Alloy, Alclad 2024, Plate and Sheet (DoD Adopted)

(Copies of these documents are available from [www.sae.org](http://www.sae.org) or SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

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2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 Qualification. The coatings furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.2 and 6.3).

3.2 Materials. The coatings shall be made from materials that ensure compliance to the requirements of this specification.

#### 3.2.1 Form.

3.2.1.1 System coatings. Coatings shall be water emulsions which are capable of being sprayed and stripped as a system. Coatings shall be either:

- a. A type II two-part coating system consisting of a black pigmented class 1 basecoat and a compatible white or olive drab pigmented class 5 topcoat, or
- b. A type II two-part coating system consisting of a black pigmented class 1 basecoat and a compatible white pigmented class 6 topcoat.

3.2.1.2 Repair coatings. Repair or patching to either of the systems above shall be accomplished using type II, class 7 brushable topcoat only.

3.2.2 Toxicity. The coatings shall have no adverse effect on the health of personnel when used for its intended purpose (see 6.3.2.1 and 6.3.2.2).

#### 3.3 Performance.

3.3.1 Properties. The physical, mechanical, and chemical properties of the individual components and the coating systems shall be in accordance with the requirements and related tests as specified in tables I and II.

3.3.2 Apparent viscosity. The limits of the apparent viscosity of type II, classes 1, 1A, 5, 6, 6A, and 7 when measured in accordance with 4.5.15, shall be:

- a. Type II, class 1 and class 1A when measured at a temperature of  $75 \pm 2$  °F and at 6 revolutions per minute (rpm), shall be 12,000 to 16,000 cycles per second (cps).

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- b. Type II, class 5, when measured at a temperature of  $75 \pm 2$  °F and at 6 rpm, shall be 2,000 to 5,000 cps.
- c. Type II, class 6 and class 6A using an LVT model viscometer when measured at a temperature of  $75 \pm 2$  °F and at  $118 \pm 2$  °F shall be:  
     at 60 rpm – 450 to 950 cps  
     at 6 rpm – 2,000 to 6,000 cps  
     at 0.3 rpm – 20,000 to 60,000 cps  
     and when measured at  $45 \pm 2$  °F shall be:  
     at 60 rpm – 450 to 1,800 cps  
     at 6 rpm – 2,000 to 7,000 cps  
     at 0.3 rpm – 20,000 to 60,000 cps
- d. Type II, class 7, measured at a temperature of  $75 \pm 2$  °F shall be:  
     at 0.3 rpm – 600,000 to 900,000 cps  
     at 1.5 rpm – 180,000 to 280,000 cps

TABLE I. Individual component physical properties.

Physical Property	Requirement				Test Method Paragraph
	Type II, Class 1 & 1A	Type II, Class 5	Type II, Class 6 & 6A	Type II, Class 7	
Chemical attack	No attack on plastic	No attack on plastic	No attack on plastic	No attack on plastic	4.5.1
Nonvolatile content, min., % by weight	37	42	48	50	4.5.2
Delivery rate, cc/min	175-700	250-700	250-700	N/A	4.5.3
Vertical application	No sagging 3 mil thickness	No sagging 3 mil thickness	No sagging 3 mil thickness	N/A	4.5.4
Drying time, max.	3 hrs.	2 hrs.	2 hrs.	2 hrs.	4.5.5
Storage	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>2/</u>	4.5.13

1/ After storage exposure, coating shall meet the requirements of delivery rate, vertical application, drying time viscosity, adhesion (initial only), tensile strength and elongation tests.

2/ After storage exposure, coating shall meet the requirements of the drying time test.

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TABLE II. Coating system properties.

Property	Requirement	Test Method Paragraph
Craze attack on plastic	Shall protect the surface of the acrylic plastic from attack and shall be strippable after exposure.	4.5.6
Adhesion, initial (as received)	3-20 oz/inch, width	4.5.7
Adhesion after accelerated drying	8-50 oz/inch, width	4.5.8
Adhesion after exposure to high humidity	8-50 oz/inch, width, no dissolution of coating	4.5.9
Tensile strength	1700 psi, min.	4.5.10
Ultimate elongation	170-350 percent	4.5.10
Stability	Shall meet the requirements of the following tests after exposure to the stability test cycle:  a. Strippability after accelerated weathering. b. Adhesion (all conditions) c. Tensile strength d. Ultimate elongation	4.5.11
Weathering	Coating shall not show checking, cracking, or embrittlement which penetrates to the substrate, and shall be strippable in one continuous sheet. There shall be no crazing of plastic surfaces. Finished surfaces shall not lift, mar, or show other irregularities. Aluminum panels shall not corrode.	4.5.12
Water erosion resistance	Coating shall not lift, check, or erode.	4.5.14

3.3.3 Condition in container. When tested as specified in 4.5.16, the coating shall be free from grit, seeds, skins, lumps, and livering and shall show no pigment settling or caking that cannot be returned to a homogeneous state by hand stirring.

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3.3.4 Service test evaluation. Manufacturer shall submit three 5-gallon cans of Class 1 and Class 1A and three 5-gallon cans of Class 5, Class 6 and Class 6A or one 5-gallon can of Class 7. AMARG (Aerospace Maintenance and Regeneration Group) shall perform test by using product in the course of normal production to spray seal at least one entire aircraft and evaluate the usability of the material during that operation.

3.4 Precautionary marking. Each container shall be marked with the following precautionary marking in letters not less than 0.75 inch high.

“DO NOT USE IF ANY INDICATION OF FREEZING”  
AND  
“SHAKE BEFORE USE”

3.5 Freeze indicators. Freeze indicators shall be supplied as part of each container of Class 6A material.

3.6 Workmanship. Each component shall be uniform in quality, consistency, and free of agglomerates and foreign particles.

#### 4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 Qualification inspection. Qualification inspection of the coatings shall consist of examinations and tests for all the requirements of this specification.

4.3 Conformance inspection. Conformance inspection of the coatings shall consist of the examinations and tests specified in table III and table IV.

##### 4.3.1 Sampling.

4.3.1.1 Sampling for tests. Two containers of one type and class shall be randomly selected from each lot offered for inspection. An amount of material sufficient to perform the tests specified in 4.3.2.1 shall be withdrawn from each of the two containers and placed in separate clean, dry, metal, or glass containers. Each container shall be tested as specified in 4.3.2.1.

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4.3.1.2 Examination of end item. A random sample of filled containers shall be selected from each inspection lot in accordance with ASQ-Z1.4, Inspection Level I, for examination of the end item as specified in 4.3.2.2.

4.3.2 Inspection and tests.

4.3.2.1 Testing. The samples selected in 4.3.1.1 shall be subjected to the tests specified in table III. Failure of any sample to pass all the tests shall be cause for rejection. The lot represented by the test samples shall be rejected.

TABLE III. Conformance tests. 1/

Property	Requirement	Test Method Paragraph
Nonvolatile content	Table I	4.5.2
Delivery rate	Table I	4.5.3
Vertical application	Table I	4.5.4
Adhesion, initial (as received)	Table II	4.5.7
Apparent viscosity	3.3.2	4.5.15

1/ Conformance testing for type II, class 7 shall consist only of nonvolatile content and apparent viscosity tests.

4.3.2.2 Visual examination. The sample selected in accordance with 4.3.1.1 shall be visually examined for the defects specified in table IV. There shall be no defects.

TABLE IV. Visual examination of the end item.

Examine	Defect
Form	Class not as specified.
Appearance	Color not as specified. Coating filled with lumps. Foreign matter present.
Fill of individual coating container (metal can, pail, drum)	Quantity of coating not as specified.
Condition in container	Grit, seeds, skins, lumps, livering, pigment settling or caking.
Freeze indicators	Not supplied as part of the each container. Indicate freezing has occurred.



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4.4 Inspection conditions. Unless otherwise specified, all tests shall be conducted at a temperature of  $70 \pm 5$  °F and  $50 \pm 10$  percent relative humidity.

4.4.1 Plastic test panels. All plastic test panels shall be made from acrylic plastic sheet conforming to MIL-PRF-5425, Finish A. The panel shall be given a preliminary cleaning with a cloth saturated with water or aliphatic naphtha conforming to type II of TT-N-95, rinsing with warm water, and drying with a lint-free cloth. Polish conforming to P-P-560 shall be evenly applied, allowed to dry, and wiped clean with a lint-free cloth.

4.4.2 Aluminum test panels. Aluminum panels shall be made from aluminum alloy (Alclad 2024) conforming to SAE-AMS-QQ-A-250/5.

4.4.3 Coating of panels. Plastic and aluminum panels shall be coated.

4.4.3.1 Type II, two-coat systems. There are two type II, two-coat systems; namely, a combination of class 1 or 1A with class 5, and a combination of class 1 or 1A with class 6 or 6A.

4.4.3.1.1 Class 1 or 1A with class 5 system. Class 1 or 1A, black, basecoat material shall be applied in one horizontal pass and one vertical pass and allowed to air dry for one hour. This procedure shall be repeated until a total class 1 or 1A dry film thickness of 9 mils has been applied. After a minimum drying period of 2 hours, the class 5 material shall be applied over the class 1 or 1A material. Class 5 material shall be applied in one horizontal pass and one vertical pass to a dry film thickness of  $3 \pm 1$  mils. Total dry film thickness shall be  $12 \pm 1$  mils.

4.4.3.1.2 Class 1 or 1A with class 6/6A system. Class 1 or 1A, black, basecoat material shall be applied in one horizontal pass and one vertical pass and allowed to air dry for one hour. This procedure shall be repeated until a total class 1 or 1A dry film thickness of 9 mils has been applied. After a minimum drying period of 2 hours, the class 6/6A material shall be applied over the class 1 or 1A material. Class 6 or 6A material shall be applied in one horizontal pass and one vertical pass to a dry film thickness of  $6 \pm 1$  mils. Total dry film thickness shall be  $15 \pm 1$  mils.

4.4.4 Mechanical mixing. All samples to be tested in 4.5 shall be mechanically mixed with a motorized impeller for a minimum of 30 minutes.

4.5 Test methods.

4.5.1 Chemical attack. Three 1 x 4 x 0.125 inch plastic strips shall be cleaned as specified in 4.4.1 and then immersed to one-half of their length in a screw-top bottle containing the coating, the lid tightened, and bottle stored for 24 hours at a temperature of  $100 \pm 3$  °F. The strips shall then be removed and examined for attack on the plastic. The coating shall meet the requirement as specified in table I.

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4.5.2 Nonvolatile content. The nonvolatile content shall be determined in accordance with ASTM D2369 and shall meet the requirement as specified in table I.

4.5.3 Delivery rate. A DeVilbiss MBC spray gun using a type FF fluid tip, a No. 765 air cap, and a maximum fluid-nozzle screw adjustment shall be used. The line pressure shall be 55 to 75 psi, and the cup pressure shall be 16 psi. One quart of coating shall be placed in a pressure feed cup and sprayed into a graduated cylinder. The volume of coating delivered in 1 minute shall be noted. In the absence of the DeVilbiss MBC spray gun, airless spray equipment such as the Grayco Bulldog Model #205-591 (or equivalent as approved by the qualifying activity) gun having a standard reverse-A-clean tip with an orifice between 0.017 and 0.021 and a spray angle between 40 degrees to 80 degrees shall be used. The delivery rate shall meet the requirement as specified in table I.

4.5.4 Vertical application. The coating shall be placed in a pressure feed cup and sprayed with a gun described in 4.5.3 on a vertical plastic panel. The gun shall be held perpendicular to and 6 to 10 inches from the panel and shall be adjusted so that one application of the coating produces the required thickness (see table I). The panel shall be examined for sagging of the coating and shall meet the requirements as specified in table I.

4.5.5 Drying time. Four 4 x 8 x 0.250 inch plastic panels shall be coated individually as follows: Type II, classes 1 or 1A and 5 shall be coated to a thickness of  $3 \pm 1$  mils; type II, class 6 or 6A shall be coated to a thickness of  $6 \pm 1$  mils and type II, class 7 shall be coated to a thickness of  $12 \pm 2$  mils. The coated panels shall be conditioned at a temperature of  $70 \pm 1$  °F and 65 percent relative humidity for the required drying time (see table I). After each application, the coating shall be dry to touch within the maximum time as specified in table I.

4.5.6 Craze attack on plastic. Six machined plastic panels, each 1 x 7 x 0.250 inch, cleaned as specified in 4.4.1, shall be set up as cantilever beams as shown on figure 1, and stressed to 2,400 psi. The formula for calculating load shall be as indicated on figure 1. Ten minutes after the beams have been loaded and while still under load they shall be examined for crazing. Three panels under stress shall then be coated on the top side by applying a puddle of the coating to the stressed plastic, taking care not to expose the side of the specimen, and shall be allowed to air dry for 24 hours. Three uncoated panels shall be used as a control. At the end of the exposure time, the stress shall be removed, the coatings stripped, and all panels examined for crazing. All panels shall meet the requirements specified in table II. In the event the control panels craze, tests shall be repeated. All craze appearing at the edges of the specimen shall be disregarded unless they extend 0.125 inch or more from either edge of the specimen.

4.5.7 Adhesion, initial (as received). Five bare plastic panels, and five aluminum panels painted as described in 4.5.12.1e, each 1.5 x 6 x 0.125 inches, shall be coated as specified in 4.4.3. The panels shall then be allowed to air dry 24 hours prior to testing. A one-inch-wide strip shall be cut only through the coating and parallel to the long dimension of the panel

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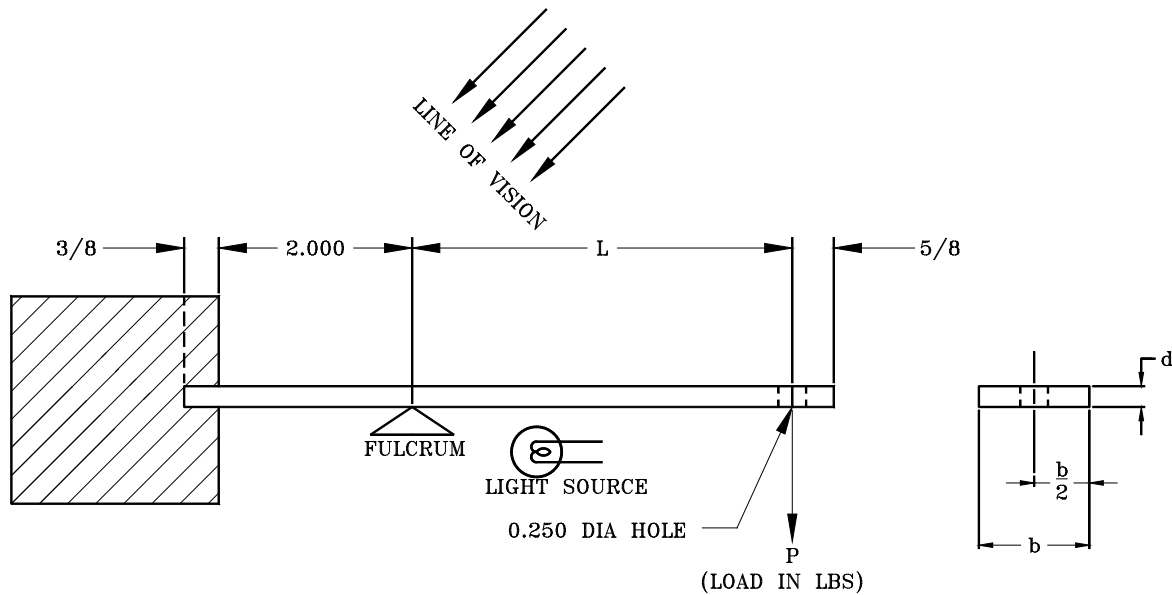
(allowing 0.25 inch on each side). One end of the 1 inch strip of coating shall be loosened from the panel (not more than 1 inch) and a leader attached. The panel shall be clamped in one jaw of a pendulum-type testing machine and the free end of the leader pulled back 180 degrees and clamped in the other jaw. The testing machine shall have at least a 4-pound range, and the rate of jaw separation shall be 2 inches per minute. The load required to remove the strip of coating from the panel shall be recorded for each panel and the average load in ounces per inch of width reported for each type of panel. The coating adhesion shall meet the requirement as specified in table II.

4.5.8 Adhesion after accelerated drying. Five bare plastic panels, and five aluminum panels painted as described in 4.5.12.1e, each 1.5 x 6 x 0.125 inches, shall be prepared as specified in 4.4.3, and allowed to air dry 24 hours prior to testing and then subjected for 100 hours to accelerated drying by exposure in a desiccator (containing fresh anhydrous calcium chloride) at a temperature of  $120 \pm 2$  °F. The coating shall be removed from each panel as specified in 4.5.7. The load required to remove the strip of coating from the panel shall be recorded for each panel and the average load in ounces per inch of width reported for each type of panel. No residue shall be left on the surface of the plastic or painted aluminum. The coating adhesion shall meet the requirement as specified in table II.

4.5.9 Adhesion after exposure to high humidity. Five bare plastic panels, and five aluminum panels painted as described in 4.5.12.1e, each 1.5 x 6 x 0.125 inches, two hours after coating as in 4.4.3, shall be subjected for 24 hours to an atmosphere of 100 percent relative humidity at a temperature of  $120 \pm 2$  °F. The panels shall be air dried for 24 hours at room temperature. The coating shall be removed from each panel as specified in 4.5.7. The load required to remove the strip of coating from the panel shall be recorded for each panel and the average load in ounces per inch of width reported for each type of panel. The coating adhesion shall meet the requirement as specified in table II.

4.5.10 Tensile strength and ultimate elongation. Coating as specified in 4.4.3 shall be sprayed on an 8 x 8 inch glass panel and air dried for 24 hours, removed carefully, and cut into five 1 x 6 inch specimens. The specimens shall be oven dried at a temperature of  $120 \pm 2$  °F for 24 hours. The specimens shall then be conditioned for 4 hours at a temperature of  $73.5 \pm 3$  °F and a relative humidity of  $50 \pm 5$  percent. The thickness and width of film shall then be measured within the gage length using a dial indicator having an accuracy of 0.0001 inch, with a 0.25 inch diameter flat foot, under a total load of  $1.2 \pm 0.1$  ounces. A pendulum-type testing machine shall be used, and the rate of jaw separation shall be 12 inches per minute. The average tensile strength and ultimate elongation shall be recorded and shall meet the requirement as specified in table II.

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DIMENSIONS IN INCHES. TOLERANCES: DECIMALS,  $\pm 0.005$ , FRACTIONS,  $\pm 1/64$

FORMULA FOR CALCULATING LOAD:  $P = \frac{Sbd^2}{6L}$

WHERE:

S = STRESS IN POUNDS PER SQUARE INCH

P = LOAD IN POUNDS

L = DISTANCE FROM FULCRUM TO LOAD IN INCHES

b = WIDTH OF PANEL IN INCHES (MEASURED TO NEAREST 0.001)

d = THICKNESS OF PANEL IN INCHES (MEASURED TO NEAREST 0.001)

NOTE: TO PREVENT HEATING OF SPECIMENS, THE LIGHT SOURCE SHALL BE UTILIZED ONLY WHEN EXAMINING THE SPECIMEN FOR CRAZE.

FIGURE 1. Typical stress crazing beam.

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4.5.11 Stability. One gallon of the coating shall be placed in a container of the same type (except for size and method of closure) as normally used by the supplier, the lid tightened, and the container subjected to the following successive conditions:

- a. 120 hours at a temperature of  $30 \pm 1$  °F.
- b. 24 hours at room temperature.
- c. 240 hours at a temperature of  $150 \pm 2$  °F.
- d. 24 hours at room temperature.

Panels coated as specified in 4.4.3 with the coating tested above shall then be subjected to and pass the following tests. If the coating is too viscous, enough water shall be added to obtain the recommended delivery rate.

- a. Adhesion, initial (as received).
- b. Adhesion after accelerated drying in Fadeometer.
- c. Adhesion after exposure to high humidity.
- d. Tensile strength and ultimate elongation.

4.5.12 Weathering.

4.5.12.1 Preparation of panels. Three-inch by six inch panels, prepared as shown herein, shall be coated as specified in 4.4.3.

- a. Three bare panels of 0.125 inch thick plastic conforming to MIL-PRF-5425 and prepared as specified in 4.4.1.
- b. Three bare panels of aluminum alloy (Alclad 2024) conforming to SAE-AMS-QQ-A-250/5.
- c. Three aluminum panels sprayed with one coat of epoxy-polyamide conforming to MIL-PRF-23377 to a dry film thickness of 0.6 mils to 0.8 mils and air dried for three hours. Panels shall then be sprayed with two cross coats of lacquer conforming to MIL-PRF-81352 to a total dry film thickness of  $1.2 \pm 0.2$  mils, with a one-half hour air dry interval between coats. The lacquer shall have been reduced 1 volume package material to 1.5 volumes thinner composed of 2 parts toluol to one part xylol by volume. Air dry panels for 1 week before testing.
- d. Three aluminum panels sprayed with one coat of wash primer conforming to MIL-C-8514 to a dry film thickness of 0.2 mils to 0.3 mils and air dried for 30 minutes. Panels shall then be coated as specified in 4.5.12.1c.

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- e. Three aluminum panels sprayed with one coat of epoxy-polyamide primer conforming to MIL-PRF-23377 to a dry film thickness of 0.6 mils to 0.8 mils and air dried for three hours. Panels shall then be sprayed with two cross coats of polyurethane coating, conforming to MIL-PRF-85285 (color number 36440 of FED-STD-595) to a total dry film thickness of  $1.2 \pm 0.2$  mils with a one-half hour air dry interval between coats. The polyurethane coating material shall have been reduced in accordance with MIL-T-81772 thinner to a viscosity of 16-18 seconds (#2 Zahn cup). Air dry panels for one week before testing.
- f. Three aluminum panels prepared as follows: Spray the panels with one coat of epoxy primer conforming to MIL-PRF-23377 to a dry film thickness of 0.6 mils to 0.8 mils and air dry for one hour. Apply a mist coat of white epoxy finish conforming to MIL-PRF-22750 and air dry 60 minutes. Then apply a full coat of the white epoxy finish to a dry film thickness of 1.1 mils to 1.5 mils. The white epoxy finish shall have been reduced 2 volumes of admixed epoxy topcoat to 1 volume of A-A-857 thinner. Dry for a minimum of 24 hours.

4.5.12.2 Procedure. After application of the coating, the panels shall remain for at least 20 hours at a temperature of 70 to 80 °F and then be placed on exterior racks under the sun for a period of 1 year. At the end of the exposure period the coated panels shall be examined for checking, cracking, embrittlement, lifting, peeling, and erosion; coating shall be examined for strippability; plastic surface examined for crazing, haze, or other residue; and the painted surface examined for lifting, marring, staining, or other irregularities. The aluminum panels shall be examined for corrosion. The coating shall meet the requirement as specified in table II.

4.5.13 Storage. For qualification, a closed, filled container of coating shall be stored at a temperature of 70 °F with no temperature exceeding a range of 40 to 115 °F for one year. At the end of the storage period the container shall be opened and the coating shall not be permanently gelled nor shall it show indication of livering or separation. In addition, the coating shall meet the requirements as specified for delivery rate, vertical application, drying time, viscosity, adhesion (initial only), tensile strength and elongation.

4.5.14 Water erosion resistance. Three bare plastic panels, and three aluminum panels painted as described in 4.5.12.1e, each 3 x 6 x 0.125 inches, shall be coated as specified in 4.4.3. After two hours air dry, the panels shall be exposed in a vertical position to a simulated rainfall for two hours. The rainfall shall consist of a steady spray of water producing uniform droplets at a rate of  $2 \pm 0.5$  inches per hour. After waiting 24 hours, the panels shall be examined for lifting, checking, or erosion of the coating and shall meet the requirement as specified in table II.

4.5.15 Apparent viscosity. The apparent viscosity shall be measured with a Brookfield Model LVT viscometer under the following conditions. The immersed portion of the rotating spindle shall be a cylinder 3.1 cm long and 0.32 cm in diameter (No. 3 spindle immersed to

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center of immersion groove). The sample shall be contained in a beaker or cylinder not less than 3.0 cm in diameter to a depth of not less than 4.5 cm. All measurements shall be made with the rotor guard removed from the instrument, and apparent viscosity shall be computed without the application of the correction factors normally applied when the instrument is used without a guard. Samples shall be stirred to ensure uniformity. The temperature of the sample shall be checked before measurements by immersing a thermocouple or thermometer in the sample to ensure that the temperature is at  $75 \pm 2$  °F. Type II, class 6, shall be tested at a temperature of  $45 \pm 1$  °F and  $118 \pm 1$  °F as well as  $75 \pm 2$  °F. When measuring the apparent viscosity at a temperature of 45 °F, the sample shall be held undisturbed at 45 °F, with the spindle immersed, for two hours before beginning measurements. The instrument shall remain outside the cold chamber, using an extension shaft if necessary. The spindle shall be rotated at 60 rpm for at least one minute, after which readings shall be made at 60, 6, and 0.3 rpm followed immediately by a series at 0.3, 6, and 60 rpm. The spindle shall be allowed to rotate at each speed until a constant reading is obtained. Pairs of readings at the same speed should not differ by more than 10 percent, and the apparent viscosity shall be within the ranges specified in 3.3.2. A No. 2 spindle shall be used for the 0.3 rpm readings when a dial reading of less than 10 is obtained using the No. 3 spindle. A No. 4 spindle shall be used when testing type II, class 7 material.

4.5.16 Condition in container. The coating shall be examined visually for the defects as specified in 3.3.3 and shall be stirred by hand with a paddle to determine compliance with the requirements as specified in 3.3.3.

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities is within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. These coatings are for use exclusively in military applications to cover military aircraft for long term storage in a desert environment and for transport in extreme seagoing environments not encountered by commercial aircraft. They are intended for use as follows:



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- a. Type II, class 1 and 1A, black. This material is intended for use as (1) a strippable, protective coating for acrylic plastic bulk materials and assemblies containing acrylic plastics when the protected item is shipped fully covered or stored under cover, and (2) as a basecoat for type II, class 5 and class 6 and 6A materials.
- b. Type II, class 5, white or olive drab. This material is intended to be used only as a topcoating for type II, class 1 material. In combination, this protective coating system serves as a sprayable, strippable, protective coating for application on metallic, painted and plastic surfaces, such as entire aircraft, missiles, rockets, and transportation vehicles during outdoor storage and overseas deck loaded shipments. For Army use, the color should conform to FED-STD-595, Color No. 24084.
- c. Type II, class 6 and 6A, white. This material is intended to be used only as a topcoating for type II, class 1 material. In combination this protective system serves as a sprayable, strippable, protective coating for applications on metallic, painted, and plastic surfaces, such as entire aircraft, missiles, rockets, and transportation vehicles during outdoor storage and overseas deck loaded shipments. It is recommended for use with Binks Model No. 18 or DeVilbiss MBC spray gun.
- d. Type II, class 7. This material is intended as a brushable coating for patching or repairing damaged class 5 or class 6 coatings.

6.1.1 Unintended use. The coatings should not be used as a barrier or intermediate coat under lacquers, primers, enamels, or similar materials.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of the specification.
- b. Type and class (see 1.2).
- d. Quantity.
- e. Name and address of the Government activity responsible for conducting the conformance inspection program.
- f. Type and capacity of containers required.
- g. Selection of capacity of containers required.
- h. Packaging requirements (see 5.1).
- i. Special marking, when required.

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL-6799, whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for



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qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from the Commander, Naval Air Warfare Center Aircraft Division, Bldg. 2188, Code 4.3.4.2, 48066 Shaw Road, Unit 5, Patuxent River, MD 20670-1161. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at <https://assist.daps.dla.mil>.

6.3.1 Sample information. Upon receipt of the letter of authorization, samples should be furnished at no cost to the Government. Transportation charges are the responsibility of the manufacturer. In the case of failure of the sample or samples submitted, consideration will be given for additional tests if changes have been made in the product which the Government considers sufficient to warrant additional tests. The costs of retest will be borne by the manufacturer.

6.3.2 Qualification inspection samples. The qualification sample should consist of 20 gallons (5 gallons for initial qualification and 15 gallons for service evaluation) or an equivalent amount of material in smaller containers for all coatings except type II, class 7 which should consist of 5 gallons. The material should be furnished in containers of the type to be used in filling contracts or orders. Type II samples for qualification of the class 5 system should be a sample of a black pigmented class 1 or 1A undercoat and a compatible white pigmented class 5 topcoat. Type II samples for qualification testing of class 6 or 6A system should be samples of a black pigmented class 1 or 1A 3+ undercoat and a compatible white pigmented class 6 or 6A topcoat. A class 7 material may be submitted for qualification in conjunction with either a class 5 or class 6 or 6A material. Samples should be forwarded as directed by the qualifying activity. The samples should be plainly and durably marked with the following information:

Samples for qualification inspection  
 COATINGS, SPRAYABLE, STRIPPABLE, PROTECTIVE, WATER EMULSION  
 Name of manufacturer (include plant where material is manufactured)  
 Product code number  
 Type  
 Class  
 Date of manufacture (month and year)  
 Submitted by (name) (date) for qualification inspection  
 The requirements of Specification MIL-PRF-6799L under authority  
 (reference authorizing letter)

6.3.2.1 Toxicological data and formulations. The manufacturer should furnish the toxicological and formulation data to evaluate the safety of the material for the proposed use. A statement of the complete formulation of the product, to include the chemical name and percent of each ingredient, as well as a material safety data sheet of the product, prepared in

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accordance with FED-STD-313, should be submitted to the qualifying activity. The pertinent government mailing addresses for submission of data are listed in FED-STD-313.

6.3.2.2 Health/hazard assessment (HHA). The qualifying activity will request the Navy Environmental Health Center (NAVENVIRHLTHCEN) to perform an HHA on the product furnished. Prior to listing on the Qualified Products List, the results of the NAVENVIRHLTHCEN HHA must be deemed acceptable by the qualifying activity. The HHA is a review of the product based on information submitted by the manufacturer, to assess health hazards associated with the handling, application, and use of the product. Information on the HHA process can be found at [http://www-nehc.med.navy.mil/occupational\\_health/industrial\\_hygiene/hazmat\\_ahha.aspx](http://www-nehc.med.navy.mil/occupational_health/industrial_hygiene/hazmat_ahha.aspx). BUMEDINST 6270.8B provides additional information/guidance pertaining to this process). Sufficient data to permit an HHA of the product is to be provided by the manufacturer to the Commanding Officer, Navy Environmental Health Center, 620 John Paul Jones Circle, Suite 1100, Portsmouth, VA 20378-2103.

6.3.3 Retention of qualification. In order to retain qualification of a product approved for listing on the Qualified Product List (QPL), the Government will require the manufacturer to verify by certification to the qualifying activity that the manufacturer's product complies with the requirements of this specification. The time of periodic verification by certification will be in two year intervals from the date of original qualification and will be initiated by the Government. The Government reserves the right to re-examine the qualified product whenever deemed necessary to ensure that the product continues to meet any or all of the specification requirements.

6.4 Relationship. Relationships of the type and classes of this specification to those of the previous revisions are indicated in table V.

6.5 Subject term (key word) listing.

- Aircraft coating
- Aircraft protection
- Desert storage
- Multi-coat system
- Outdoor storage
- Preservation
- Protective coating
- Stripper

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

TABLE V. Superseding data.

MIL-C-6799C	MIL-C-06799D(AS)	MIL-C-6799E	MIL-C-6799F	MIL-C-6799G	MIL-C-6799H	MIL-C-6799J	MIL-PRF-6799K	MIL-PRF-6799L
Type I	Type I, Class 1	Type I, Class 1	Type I, Class 1	Type I, Class 1	-----	-----	-----	-----
Type II, Class 1, Black or Gray	Type II, Class 1, (Black)	Type II, Class 1, (Black)	Type II, Class 1, (Black)	Type II, Class 1, (Black)	Type II, Class 1, (Black)	Type II, Class 1, (Black)	Type II, Class 1, (Black)	Type II, Class 1, (Black)
-----	-----	-----	-----	-----	-----	-----	-----	Type II, Class 1A, (Black)
Type II, Class 1, Black or Gray	Type II, Class 2 (Gray)	Type II, Class 2, (Gray)	Type II, Class 4, (Gray)	Type II, Class 4 (Gray)	-----	-----	-----	-----
Type II, Class 2, White (waterbase)	Type I, Class 2	Type I, Class 2	Type I, Class 2	Type I, Class 2	-----	-----	-----	-----
-----	Type II, Class 3, (White)	Type II, Class 3, (White)	Type II, Class 5, (White or Olive drab)	Type II, Class 5, (White or Olive drab)	Type II, Class 5, (White or Olive drab)	Type II, Class 5, (White or Olive drab)	Type II, Class 5, (White or Olive drab)	Type II, Class 5, (White or Olive drab)
Type II, Class 3, White (solvent base)	Not applicable 1/	Not applicable 1/	Not applicable 1/	Not applicable 1/	Not applicable 1/	Not applicable 1/	Not applicable 1/	Not applicable 1/
-----	-----	-----	-----	Type II, Class 6 (White)	Type II, Class 6, (White)	Type II, Class 6, (White)	Type II, Class 6, (White)	Type II, Class 6, (White)
-----	-----	-----	-----	-----	-----	-----	-----	Type II, Class 6A, (White)
-----	Type III	Type III	Type III, Class 1, Type III, Class 2	Type III, Class 1, Type III, Class 2	-----	-----	-----	-----
Type II, Class 7	-----	-----	-----	-----	-----	Type II, Class 7	Type II, Class 7	Type II, Class 7
1/ Solvent base coating not covered by revision								

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CONCLUDING MATERIAL

Custodians:

Army - MR

Navy - AS

Air Force - 99

Preparing activity:

Navy - AS

(Project 8030-2009-011)

Review activity:

Army - AV

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.daps.dla.mil>.