

NOT MEASUREMENT
SENSITIVE

MIL-PRF-85285C
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SUPERSEDING
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PERFORMANCE SPECIFICATION

COATING: POLYURETHANE, HIGH-SOLIDS

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

1. SCOPE

1.1 Scope. This specification covers the requirements for a high-solids, aliphatic polyurethane coating with the maximum volatile organic compounds (VOC) content specified in 1.2. The coating is furnished in kit form.

1.2 Classification. The coating will be of the following types, as specified (see 6.2):

Type I - Aircraft application (420 grams/liter (g/l) maximum VOC content)

Type II - Ground support equipment application (340 g/l maximum VOC content)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Air Warfare Center Aircraft Division Code 414100 B120-3, Highway 547, Lakehurst, NJ 08733-5100, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8010

DISTRIBUTION STATEMENT A Approved for public release; distribution is unlimited.

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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 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 here-in. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

- | | | |
|------------|---|---|
| QQ-A-250/4 | - | Aluminum Alloy 2024, Plate and Sheet |
| PPP-P-1892 | - | Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing and Marking of |

DEPARTMENT OF DEFENSE

- | | | |
|---------------|---|---|
| MIL-C-5541 | - | Chemical Conversion Coatings on Aluminum and Aluminum Alloys |
| MIL-H-5606 | - | Hydraulic Fluid, Petroleum Base, Aircraft, Missile and Ordnance |
| MIL-T-5624 | - | Turbine Fuel, Aviation, Grades JP-4, JP-5, and JP-5/JP-8 |
| MIL-A-8625 | - | Anodic Coatings, for Aluminum and Aluminum Alloys |
| MIL-PRF-23377 | - | Primer Coatings: Epoxy, High-Solids |
| MIL-R-81294 | - | Remover, Paint, Epoxy, Polysulfide and Polyurethane Systems |
| MIL-T-81772 | - | Thinner, Aircraft Coating |
| MIL-H-83282 | - | Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Aircraft, Metric, NATO Code Number H-537 |
| MIL-C-85570 | - | Cleaning Compound, Aircraft, Exterior |
| MIL-P-85582 | - | Primer Coatings: Epoxy, Waterborne |

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STANDARDS

FEDERAL

FED-STD-141	-	Paint, Varnish, Lacquer and Related Materials; Methods of Inspection, Sampling and Testing
FED-STD-313	-	Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities
FED-STD-595	-	Colors Used in Government Procurement

(Unless otherwise indicated, copies of the above specifications, standards and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

- 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 are those cited in the solicitation.

CODE OF FEDERAL REGULATIONS

DEPARTMENT OF LABOR

29 CFR 1910.1200	-	Occupational Safety and Health Standards - Hazard Communications
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DEPARTMENT OF TRANSPORTATION

49 CFR 171-178	-	Subchapter C - Hazardous Materials Regulations
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(Application for copies should be addressed to the Superintendent of Documents, 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 the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

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AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

- ANSI-Z129.1 - American National Standard for the Precautionary Labeling of Hazardous Industrial Chemicals (DoD Adopted)

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM-D185 - Coarse Particles in Pigments, Pastes, and Paints, Standard Test Method for (DoD Adopted)
- ASTM-D522 - Mandrel Bend Test of Attached Organic Coatings, Standard Test Methods for (DoD Adopted)
- ASTM-D523 - Specular Gloss, Standard Test Method for (DoD Adopted)
- ASTM-D823 - Producing Films of Uniform Thickness of Paint, Varnish, and Related Product on Test Panels, Standard Practices for (DoD Adopted)
- ASTM-D1200 - Viscosity by Ford Viscosity Cup, Standard Test Method for (DoD Adopted)
- ASTM-D1210 - Fineness of Dispersion of Pigment-Vehicle Systems, Standard Test Method for (DoD Adopted)
- ASTM-D1296 - Odor of Volatile Solvents and Diluents, Standard Test Method for (DoD Adopted)
- ASTM-D1364 - Water in Volatile Solvents (Fischer Reagent Titration Method), Standard Test Method for (DoD Adopted)
- ASTM-D1640 - Drying, Curing, or Film Formation of Organic Coatings at Room Temperature, Standard Test Methods for (DoD Adopted)
- ASTM-D2244 - Calculation of Color Differences From Instrumentally Measured Color Coordinates, Standard Test Method for (DoD Adopted)
- ASTM-D2247 - Testing Water Resistance of Coatings in 100% Relative Humidity, Standard Practice for (DoD Adopted)
- ASTM-D3335 - Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy, Standard Test Method for (DoD Adopted)
- ASTM-D3432 - Unreacted Toluene Diisocyanates in Urethane Prepolymers and Coating Solutions by Gas Chromatography, Standard Test Method for (DoD Adopted)
- ASTM-D3718 - Low Concentrations of Chromium in Paint by Atomic Absorption Spectroscopy, Standard Test Method for (DoD Adopted)

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- ASTM-D3924 - Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials, Standard Specification for (DoD Adopted)
- ASTM-D3960 - Determining Volatile Organic Content (VOC) of Paints and Related Coatings, Standard Practice for (DoD Adopted)
- ASTM-E275 - Describing and Measuring Performance of Ultraviolet, Visible, and Near-Infrared Spectrophotometers, Standard Practice for
- ASTM-G26 - Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials, Standard Practice for (DoD Adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959)

AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC)

- ASQC-Z1.4 - Sampling Procedures and Tables for Inspection by Attributes (DoD Adopted)

(Application for copies of ASQC-Z1.4 should be addressed to the American Society for Quality Control, PO Box 3005, 611 East Wisconsin Avenue, Milwaukee, WI 53201-4606.)

2.4 Order of precedence. 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 (QPL) before contract award (see 4.3 and 6.7). Any change in formulation of a qualified product, except as allowed in 6.12, necessitates its requalification.

3.2 Materials. Materials used to manufacture these coatings are not limited, provided that the resulting coating(s) conform to the requirements of this specification.

3.3 Toxicity. When required (see 6.2), the manufacturer shall certify that the coatings supplied under this specification have no adverse effect on the health of personnel when used for their intended purpose and under the precautions listed in 3.10.1. A Material Safety Data Sheet (MSDS) is to be prepared in accordance with FED-STD-313 and 29 CFR 1910.1200 (see 6.8). Questions pertinent to the effect(s) of these coatings on the health of personnel using them should be referred by the procuring activity to the appropriate medical service, who will act as an

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advisor. Information regarding polyurethane coatings and personnel protective methods for handling these coatings can be found in 6.3 and 6.3.1.

3.4 Composition. The polyurethane coating furnished under this specification shall be in the form of a kit consisting of Component A, containing the pigmented polyester resins and solvents, and Component B, containing the clear, aliphatic isocyanate resins and solvents. Component B shall act as the hardener or curing agent for Component A. The volume mixing ratio shall be as specified by the manufacturer. The coating kit shall be supplied such that the admixed coating consists of the minimum volume specified by the procuring activity (see 6.2 and 6.9.1). The total free isocyanate in the admixed coating shall not exceed 1.0 percent by weight when tested in accordance with ASTM-D3432 (see 4.6 and table I). When tested in accordance with ASTM-D3335, no component of the coating shall contain cadmium, cadmium compounds, or more than 0.06 percent by weight of lead metal or lead compounds. When tested in accordance with ASTM-D3718, the coating shall not contain chromium.

3.4.1 Solvent content. All solvents necessary for thinning purposes shall be supplied as part of either the base or the activator component of the coating kit. The resistivity of the solvents shall permit application of this coating by electrostatic and non-electrostatic spray methods. When tested in accordance with ASTM-D3960 (see 4.6 and table I), the maximum VOC content shall be 420 grams per liter (g/l) for type I coatings and 340 g/l for type II coatings. Solvents used shall be urethane grade and contain a minimum of water and alcohol (see 6.4). The admixed coating shall be compatible with thinner conforming to MIL-T-81772, type I. Halogenated solvents shall not be used in the formulation of this product.

3.5 Component properties.

3.5.1 Condition in container.

3.5.1.1 Component A. Component A shall be capable of being mixed by hand with a paddle in accordance with 4.6.1; within 5 minutes, the coating shall be smooth, homogeneous, and pourable. The coating shall be free of grit, skin, seeds, lumps, foreign contaminants, and abnormal thickening or livering, and shall not exhibit pigment floatation nor excessive settling that cannot be reincorporated into a smooth, homogeneous state by mixing with a hand paddle.

3.5.1.2 Component B. Component B shall be homogeneous, clear, and free from gelation or detectable particulate matter, either suspended in solution or settled on the inner surface of the container. Component B shall not cause its container to deform.

3.5.2 Storage stability. The unopened coating components, as packaged by the manufacturer, shall meet all the requirements specified herein after storage for a period of one year where the daily temperature of the ambient air is maintained at 1.7° to 46°C (35° to 115°F).

3.5.3 Accelerated storage stability (Component B only). The coating components, as packaged by the manufacturer, shall exhibit no trace of gelation or particulate matter, either

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suspended in solution or settled on the inner surface of the container, after storage at $57^{\circ} \pm 3^{\circ}\text{C}$ ($135^{\circ} \pm 5^{\circ}\text{F}$) for no less than 24 hours and then cooled to room temperature,.

3.5.4 Moisture content. Component A shall contain no more than 2.0 percent by weight of water, when tested in accordance with ASTM-D1364 (see 4.6 and table I),.

3.6 Liquid properties.

3.6.1 Fineness of grind. The fineness of grind (measured on the Hegman scale) of the admixed coating shall be a minimum of 7 for gloss colors and a minimum of 5 for camouflage (flat or lusterless) colors when tested in accordance with ASTM-D1210 (see 4.6 and table I).

3.6.2 Coarse particles. Coarse particles retained on a No. 325 sieve shall be no more than 0.5 percent by weight of the admixed coating when tested in accordance with ASTM-D185 (see 4.6 and table I).

3.6.3 Odor. The odor of the coating, as packaged components, an admixed coating, and as a film after application, shall be characteristic of the thinners used and shall not be obnoxious when tested in accordance with ASTM-D1296 (see 4.6 and table I). The air-dried coating shall retain no residual odor 48 hours after application.

3.6.4 Viscosity and pot life. The viscosity of the admixed coating, when tested in accordance with ASTM-D1200 (see 4.6 and table I) through a No. 4 Ford cup, shall be as follows:

Time from mix (minimum)	Maximum time through a No. 4 Ford cup
Initially	30 seconds
4 hours	60 seconds
8 hours	no gel

3.7 Cured coating properties.

3.7.1 Drying time. When applied by spray techniques and when tested in accordance with ASTM-D1640, the coating shall be set-to-touch within four hours and dry-hard within twelve hours (see 4.6 and table I).

3.7.2 Surface appearance. Initially and no less than four hours after mixing, the admixed coating, applied to one vertically and one horizontally mounted test panel in accordance with 4.5 through 4.5.2 and air-dried for no less than 24 hours, shall dry to a uniform, smooth surface, free from runs, sags, bubbles, streaks, hazing, seeding, dusting, floating, mottling, or other defects.

3.7.3 Color. The admixed coating, when applied to test panels in accordance with 4.5 through 4.5.2 and tested in accordance with ASTM-D2244 (see 4.6 and table I), shall maintain a

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good visual match with the specified color chip in FED-STD-595. The color difference (ΔE) of the applied coating shall be not greater than 1.0 to be considered a good visual match.

3.7.4 Infrared reflectance (FED-STD-595, color number 34095 only). The total infrared reflectance (specular and diffuse) of the coating (FED-STD-595, color number 34095), shall be a maximum of 8, when tested relative to barium sulfate in the wavelength range of 700 to 2600 nanometers (nm) with a spectrophotometer (Perkin-Elmer LAMBDA 9, or equivalent). ASTM-E275 may be used to compare performance of the equivalent unit to the LAMBDA 9.

3.7.5 Gloss. The specular gloss of the coating, when applied to test panels in accordance with 4.5 through 4.5.2, and tested in accordance with ASTM-D523, shall be:

- a. A maximum of 9 for camouflage colors at an 85° angle of incidence;
- b. In accordance with the following table for 60° specular gloss:

Color type	Minimum	Maximum
Gloss	90	---
Semi-gloss	15	45
Camouflage (flat or lusterless)	---	5

3.7.6 Opacity (hiding power). The coating shall have a contrast ratio of no less than 0.95 (see 4.6. and table I) for all colors except yellow (FED-STD-595 Color 13538), which shall have a contrast ratio of not less than 0.90, when cast to a thickness of 1.7 to 2.3 mil [43 to 58 micrometer (μm)] on a black and white chart and tested in accordance with 4.6.2.

3.7.7 Adhesion. The coating, applied to test panels in accordance with 4.5 through 4.5.2 and then immersed in distilled water for no less than 24 hours, and then tested in accordance with FED-STD-141, Method 6301 (see 4.6 and table I), shall not peel away from the primer coating.

3.7.8 Flexibility.

3.7.8.1 Ambient temperature impact flexibility. The coating, tested in accordance with 4.6.3.1, shall meet the following minimum requirements for ambient temperature impact flexibility: type I, 40 percent; type II, 5 percent.

3.7.8.2 Low-temperature impact flexibility (type I only). The type I coating, tested in accordance with 4.6.3.2 at a temperature of $-51^{\circ} \pm 3^{\circ}\text{C}$ ($-60^{\circ} \pm 5^{\circ}\text{F}$), shall exhibit no cracking when bent, coated side away, over a 1.0 inch (in.) [25.4 millimeter (mm)] mandrel for gloss and semi-gloss colors, and over a 2.0 in. (50.8 mm) mandrel for camouflage colors.

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3.8 Resistance properties.

3.8.1 Fluid resistance. The coating, applied to test panels in accordance with 4.5 through 4.5.2, shall withstand immersion as follows:

Fluid	Fluid temperature	Time of immersion (minimum)
Lubricating oil (conforming to MIL-L-23699)	121° ±3°C (250° ±5°F)	24 hours
Hydraulic fluid (conforming to MIL-H-5606)	66° ±3°C (150° ±3°F)	24 hours
Hydraulic fluid (conforming to MIL-H-83282)	66° ±3°C (150° ±5°F)	24 hours
JP-5 fuel (conforming to MIL-T-5624)	Room temperature	7 days

At no less than four hours after removal, the coating shall not exhibit any blistering, softening, or other coating defects. Slight staining of the coating is acceptable.

3.8.2 Weather resistance. The coating, applied to test panels in accordance with 4.5 through 4.5.2, and tested in accordance with ASTM-G26, type BH (see 4.6 and table I), shall withstand exposure in a Xenon-arc weatherometer for no less than 500 hours, in accordance with 4.6.4. After removal from the weatherometer, the coating shall conform to the following:

- a. 60° specular gloss tested in accordance with ASTM-D523 shall be:
 - 1) minimum of 80 for gloss colors;
 - 2) minimum of 15 for semi-gloss colors; and
 - 3) maximum of 5 for camouflage colors;
- b. The coating color shall remain unchanged in accordance with 3.7.3, with a color difference (ΔE) value equal to or less than 1.0, when tested in accordance with ASTM-D2244.

3.8.3. Humidity resistance. The coating, applied to test panels in accordance with 4.5 through 4.5.2, shall withstand exposure for no less than 30 days in a humidity cabinet maintained at 49° ±2°C (120° ±3°F) and 100% relative humidity (RH), in accordance with ASTM-D2247 (see 4.6 and table I), without blistering, softening, exhibiting any loss of adhesion, nor other film defect(s).

3.8.4. Heat resistance (color change). The coating shall withstand exposure to 121° ±3°C (250° ±5°F) for no less than 60 minutes, when tested in accordance with 4.6.5, without experiencing a color change (color difference (ΔE) should be less than or equal to 1.0), when tested in accordance with ASTM-D2244 (see 4.6 and table I).

3.8.5 Solvent resistance (cure). The coating, when tested in accordance with 4.6.6, shall withstand repeated rubbing with a cloth rag soaked in methyl ethyl ketone (MEK) solvent. Rubbing through to bare metal indicates failure of the coating due to improper cure. For safe handling information, see 6.6.

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3.8.6 Tape resistance. The coating shall not exhibit permanent marring caused by masking tape applied to the coated test panels, when tested in accordance with 4.6.7.

3.9 Working properties.

3.9.1 Mixing. All components of the coating shall mix readily, with a hand-held paddle, to a homogeneous product.

3.9.2 Application. When mixed and ready for application, the coating material shall be homogeneous. The coating shall be capable of being applied by electrostatic and non-electrostatic spray methods. When spray applied at 60 to 100°F (16 to 38°C) and relative humidity of 20 to 85 percent, the coating material shall yield a smooth, uniform film. When reducing the coating, caution must be taken to not exceed the maximum VOC content of 420 g/l for type I and 340 g/l for type II.

3.9.3 Cleanability (type I coating only). The coating, applied to test panels in accordance with 4.5 through 4.5.2.2, shall maintain a cleaning efficiency of not less than 75 percent, when cleaned with the cleaning compound (see 4.6.8.3.1) in accordance with 4.6.8 through 4.6.8.5.

3.9.4 Strippability. A minimum of 90 percent of the coating shall be stripped in no more than 60 minutes, when tested in accordance with 4.6.9.

3.10 Marking and labeling. In addition to the marking specified in PPP-P-1892, individual containers shall bear permanent labels showing the following:

- Specification MIL-PRF-85285C, "Coating: Polyurethane High-solids"
- Component A, B, or C (as applicable)
- Color (name and FED-STD-595 color number)
- Manufacturer's name, product number, and batch number
- Date of manufacture by month and year
- VOC content in grams/liter
- Net contents
- Mixing and thinning instructions

All containers of toxic and hazardous chemicals and materials shall be labeled in accordance with the applicable federal, state, and municipal laws, statutes, regulations, and ordinances.

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3.10.1 Precautionary markings.

3.10.1.1 Container. All containers that serve as shipping containers shall be marked with the applicable precautionary information detailed in ANSI-Z129.1. In addition to the labeling specified in 49 CFR 171-178, the following shall appear on each component container in every kit and on each exterior shipping container:

CAUTION

THIS COATING MATERIAL IS TOXIC AND FLAMMABLE

DO NOT USE IN CONFINED AREAS

DO NOT USE WHERE THERE ARE OPEN FLAMES, ARCING EQUIPMENT,
HOT SURFACES, NOR WHERE SMOKING IS PERMITTED.

USE ONLY WITH ADEQUATE VENTILATION.

AVOID BREATHING OF VAPOR.

DO NOT GET IN EYES, ON SKIN, ON CLOTHING.

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH PLENTY OF
WATER. FOR EYES, GET MEDICAL ATTENTION.

Precautions (to be included on a sheet with each kit):

- a. The surface to be coated must be clean (free of oil, dust, etc.)
- b. Spray equipment must be adequately grounded. Clean equipment immediately after use with thinner conforming to MIL-T-81772, type I.
- c. Mix only the amount of coating to be used within four hours.
- d. Never mix coating from one vendor, or individual component with that of another vendor. Components from different kits are not interchangeable. For example, do not use Component A in white with Component B in gray.
- e. Apply to pretreated metal or appropriately prepared organic matrix composite surfaces.
- f. Dispose of, without opening, any container that is bulged or deformed.
- g. Open component B carefully. If the contained material is not clear, dispose of it.
- h. Perform production type operations only in specifically designated areas with local exhaust ventilation and other environmental control measures, as may be recommended on the basis of an on-site industrial hygiene survey.
- i. Perform touch-up type operations only in areas with good ventilation (such as a hangar deck or in a hangar with the doors open). Do not expose unprotected personnel in adjacent areas to mist, spray, or vapor. Application shall be restricted to brush, roller, or self-pressurized spray kit. No one person shall apply more than one quart of polyurethane coating by self-pressurized spray in any 24-hour period.

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3.10.1.2 Lid (Component B only). Each lid of Component B material shall have a red printed label with the following information:

"USE CAUTION.
OPEN SLOWLY."

4. VERIFICATION

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

- a. Qualification inspection (see 4.3).
- b. Conformance inspection (see 4.4).

4.2 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the conditions specified in ASTM-D3924, and in duplicate. Unless otherwise stated in the test method or paragraph herein, room temperature shall be defined as $21^{\circ} \pm 5^{\circ}\text{C}$ ($70^{\circ} \pm 10^{\circ}\text{F}$) and relative humidity as 50 ± 10 percent.

4.3 Qualification inspection. The qualification inspection shall consist of all tests specified in 4.6 and table I.

4.3.1 Qualification inspection samples. The test samples shall consist of a minimum of one two quart kit consisting of the following FED-STD-595 colors: 17925, 34095 (for type I only), and 36375. The material shall be furnished in the type of containers to be used in filling contract orders. Samples shall be identified as follows and forwarded to the laboratory designated in the letter of authorization (see 6.7).

- Qualification inspection samples
- Specification MIL-PRF-85285C; Type _____, Color _____
- "Coating, Polyurethane, High-solids"
- Manufacturer's name and product number
- Submitted by (name and date) for qualification testing in accordance with authorization (reference authorizing letter)

4.3.2 Test report. In addition to the qualification test samples, the manufacturer shall furnish to the qualification activity: (a) one copy of the MSDS (see 3.3); (b) a certified test report showing that the material conforms to the requirements of this specification; and (c) certification that the following chemicals were not used in the formulation of this coating: methylene chloride, trichloroethane and trichlorotrifluoroethane.

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4.4 Conformance inspection.

4.4.1 Batch and lot formation. A batch shall consist of all coating material manufactured during one continuous operation and forming part of one contract or order for delivery. A lot shall consist of all coatings of the same color, manufactured at one time from one batch, forming part of one contract, and submitted for acceptance. When required (see 6.2), the manufacturer shall furnish with each batch and/or lot a certified test report showing that the material has passed the conformance inspection, and that there has been no formulation or process change from that which resulted in the production of the qualification inspection sample.

4.4.2 Retention sample. When required (see 6.2), a minimum of one complete kit of the coating shall be selected at random from each batch by an authorized government representative and forwarded to the laboratory designated by the procuring activity.

4.4.3 Tests. The conformance inspection shall consist of all the tests specified in table I, except storage stability (3.5.2), infrared reflectance (3.7.4), weather resistance (3.8.2), humidity resistance (3.8.3), cleanability (3.9.3), and strippability (3.9.4).

4.4.3.1 Visual inspection of filled containers. Samples shall be selected at random from each lot in accordance with ASQC-Z1.4, inspection level S-2. The lot size for this examination shall be the number of kits fully prepared for delivery shall be examined for container fill, weight, and marking.

4.4.4 Rejection and retest. Failure in any conformance test shall result in rejection of that batch and shall constitute justification for removal from the qualified products list. Rejected material shall not be resubmitted for acceptance without written approval from the qualification activity (see 6.7). The application for resubmission shall contain full particulars concerning previous rejections and measures taken to correct these deficiencies. Samples for retest shall be randomly selected as in 4.4.2 and forwarded to the testing activity.

4.5 Test panels. All test panels shall be prepared under laboratory conditions (see 4.6). The dimensions for all test panels shall be approximately 0.020 by 3 by 6 in. (0.5 by 76.2 by 152.4 mm). With the exception of the panels used for flexibility testing, test panels shall be aluminum alloy 2024 (T3 temper) conforming to QQ-A-250/4. See 4.6.3 for test panels to be used for flexibility testing.

4.5.1 Panel preparation. With the exception of the panels used for flexibility testing (4.6.3), the panels shall be treated with conversion coating to produce coatings conforming to MIL-C-5541, Class 1A.

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4.5.2 Application of coatings.

4.5.2.1 Primer coating. Spray apply one cross-coat of primer coating conforming to MIL-PRF-23377 or MIL-P-85582 to a dry-film thickness of 0.6 to 0.9 mil (15 to 23 μm) in accordance with ASTM-D823 and air-dry for no less than one hour.

4.5.2.2 Topcoat. Prepare the topcoat in accordance with the manufacturer's instructions. The admixed topcoat may be reduced with thinner conforming to MIL-T-81772, type I, in accordance with the manufacturer's instructions. If reducing with thinner, do not exceed the maximum allowable VOC content (see 3.4.1). Allow the topcoat to stand no less than 30 minutes before using. Spray apply the topcoat in accordance with ASTM-D823 to a dry-film thickness of 1.7 to 2.3 mil (43 to 58 μm). Prior to testing, the applied coating shall be air-dried for no less than 14 days at room temperature (see 4.6).

4.6 Test methods. The tests of this specification shall be conducted in accordance with table I and 4.6.1 through 4.6.9 with test panels prepared in accordance with 4.5 through 4.5.2, when directed. Unless otherwise specified in the test method or paragraph, all testing shall be conducted under the laboratory testing conditions in accordance with ASTM-D3924 and in duplicate. Unless otherwise stated in the test method or paragraph, room temperature shall be defined as $21^{\circ} \pm 5^{\circ}\text{C}$ ($70^{\circ} \pm 10^{\circ}\text{F}$) and relative humidity of 50 ± 10 percent.

TABLE I. Test methods.

Requirement Paragraph	Test Title	Test Method Paragraph	FED-STD-141 Method Number	ASTM Method
3.4	Free isocyanate content	---	---	D3432
3.4	Lead and cadmium content	---	---	D3335
3.4	Chromium content	---	---	D3718
3.4.1	VOC content	---	---	D3960
3.5.1	Condition in container	4.6.1	---	---
3.5.2	Storage stability	---	---	---
3.5.3	Accelerated storage stability (component B only)	---	---	---
3.5.4	Moisture content	---	---	D1364
3.6.1	Fineness of grind	---	---	D1210
3.6.2	Coarse particles	---	---	D185
3.6.3	Odor	---	---	D1296
3.6.4	Viscosity and pot life	---	---	D1200
3.7.1	Drying time	---	---	D1640
3.7.2	Surface appearance	---	---	---
3.7.3	Color	---	---	D2244

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TABLE I. Test methods - Continued.

Requirement Paragraph	Test Title	Test Method Paragraph	FED-STD-141 Method Number	ASTM Method
3.7.4	Infrared reflectance (color number 34095, only)	---	---	---
3.7.5	Gloss	---	---	D523
3.7.6	Opacity (hiding power)	---	---	D2244
3.7.7	Adhesion, tape test	---	6301	---
3.7.8.1	Ambient temperature impact flexibility	4.6.3.1	---	---
3.7.8.2	Low-temperature impact flexibility (type I only)	4.6.3.2	---	D522
3.8.1	Fluid resistance	---	---	---
3.8.2	Weather resistance	4.6.4	---	G26
3.8.3	Humidity resistance	---	---	D2247
3.8.4	Heat resistance (color change)	4.6.5	6051	---
3.8.5	Solvent resistance (cure)	4.6.6	---	---
3.8.6	Tape resistance	4.6.7	---	---
3.9.3	Cleanability (type I only)	4.6.8	---	---
3.9.4	Strippability	4.6.9	---	---

4.6.1 Condition in container. Allow component A to stand without agitation for no less than 14 days in a closed container. Mix by hand with a paddle and examine its condition. Component B shall be examined for its condition. Examine for conformance to 3.5.1.

4.6.2 Opacity (hiding power). Cast the admixed coating to a thickness of 1.7 to 2.3 mil [43 to 58 micrometer (μm)] on a black and white chart (Lenata Form 3B, or equivalent). The contrast ratio shall be determined by measuring the "L" reflectance value of coating over the black and white side of the chart, respectively. Determine the "L" value of the coating covering the white and black part of the chart, L_w and L_b respectively, in accordance with ASTM-D2244. The contrast ratio is calculated as follows: $C = L_b \div L_w$.

4.6.3 Flexibility. Test panels shall be aluminum alloy 2024 (0 temper) conforming to QQ-A-250/4 and shall be anodized in accordance with MIL-A-8625, type I. Test panel dimensions shall be approximately 0.020 by 3.0 by 6.0 in. (0.5 by 76.2 by 152.4 mm). Apply the topcoat, without a primer, in accordance with 4.5.2.2, and allow the test panels air-dry for no less than 14 (fourteen) days before testing.

4.6.3.1 Ambient flexibility. Two test panels, prepared in accordance with 4.6.3, shall be tested with a GE Impact-Flexibility Tester (see 6.11), or equivalent, at $21^\circ \pm 5^\circ\text{C}$ ($70^\circ \pm 10^\circ\text{F}$) and

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50 ±10% RH. Place the coated panel, film downward, on the rubber pad at the bottom of the impactor guide. Drop the impactor on the panel so that the impression of the entire rim of the impactor is made in the panel. Reverse the impactor ends; drop the impactor on the panel adjacent to the first area of impact. After testing, examine the coating using the unaided eye, to determine surface cracking. Measure the percent elongation corresponding to the largest spherical impression at which no cracking occurs. Examine the coating for conformance to 3.7.8.1.

4.6.3.2 Low-temperature flexibility. Two test panels, prepared as specified in 4.6.3, shall be tested in accordance with ASTM-D522, Method B. The test shall be performed at a temperature of $-51^{\circ} \pm 3^{\circ}\text{C}$ ($-60^{\circ} \pm 5^{\circ}\text{F}$) using a 1.0 in. mandrel for gloss and semi-gloss colors and a 2.0 in. mandrel for camouflage colors. After testing, examine the coating, using the unaided eye, for conformance to 3.7.8.2.

4.6.4 Weather resistance. Test panels, prepared in accordance with 4.5, shall be exposed for no less than 500 hours in a Xenon-arc weatherometer (Atlas Electric Devices Company or equivalent) that is cycling between 102 minutes of light only and 18 minutes of light and water spray. After exposure, examine for conformance to 3.8.2. The following conditions shall apply when tested in accordance with ASTM-G26, type BH:

Black body temperature in cabinet:	$60^{\circ} \pm 3^{\circ}\text{C}$ ($140^{\circ} \pm 5^{\circ}\text{F}$)
Relative humidity in cabinet:	$50 \pm 5\%$
Intensity (spectral irradiance) of Xenon-arc:	0.3 to 0.4 watt/meter ² at a wavelength of 340 nm

4.6.5 Heat resistance. Prepare two test panels in accordance with 4.5. One test panel shall act as control, the other as the test specimen. Expose the test specimen to $121^{\circ} \pm 3^{\circ}\text{C}$ ($250^{\circ} \pm 5^{\circ}\text{F}$) for no less than 60 minutes, in accordance with FED-STD-141, Method 6051. After exposure, the coating shall be tested in accordance with ASTM-D2244 to determine the color difference (ΔE) value and examined for conformance to 3.8.4.

4.6.6 Solvent resistance (cure). Test panels shall be prepared in accordance with 4.5 through 4.5.2.2. A cotton, terrycloth rag shall be soaked in methyl ethyl ketone solvent and rubbed back and forth 25 times (50 passes) over the coating with firm finger pressure. Rubbing through to bare metal indicates failure due to improper cure. The coating shall be examined for conformance to 3.8.5.

4.6.7 Tape resistance. Test panels, prepared as specified in 4.5, shall be air-dried for no less than twelve hours. A strip of masking tape (3M Company #250 or equivalent), no less than 1.0 in. (25.4 mm) wide, shall be applied to each panel, adhesive side down, and pressed down with one pass of a roller weighing no less than 4.5 pounds (lb.) (2.04 kilograms (kg)). The tape shall remain in contact with the test panel for no less than one hour and then shall be carefully removed. Examine the coating conformance to 3.8.6.

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4.6.8 Cleanability. The cleanability test method shall be performed in accordance with 4.6.8.1 through 4.6.8.5 to determine conformance to 3.9.3.

4.6.8.1 Preparation of artificial soil. Place $50.0 \pm 0.5\text{g}$ of carbon black (see 6.10) and $500.0 \pm 1.0\text{g}$ of hydraulic fluid, conforming to MIL-H-83282, in a container, such as one quart jar. Homogenize the soil using a high shear (such as a Cowles dispersator, or equivalent) mixer for 15 ± 1 minutes. Prior to application of the soil, stir or shake the mixture by hand.

4.6.8.2 Preparation of test panels. Prepare two test panels in accordance with 4.5 through 4.5.2. Using a clean, hog bristle brush, lightly scrub the coating of each panel with a 1.0 percent (by weight) solution of Alconox detergent (see 6.10.1), or equivalent, in reagent water. Rinse each panel thoroughly three times with reagent water. Dry for no less than 18 hours at $49^\circ \pm 2^\circ\text{C}$ ($120^\circ \pm 4^\circ\text{F}$). Using ASTM-D2244, determine the L value of the coating. This will be value "A" (see 4.6.8.5).

4.6.8.3 Soiling of test panels. Using a soft-bristle brush, coat the painted surfaces of test panels with the prepared soil. Remove excess soil by covering the test panel surface with folded absorbent tissue and exerting pressure by rolling the tissue with a 5 lb. rubber roller. Repeat this blotting procedure twice. Brush the soiled surface only in one direction and parallel to the long dimension of the test panel, using 10 strokes of the hog bristle brush. Bake the test panel at $105^\circ \pm 2^\circ\text{C}$ ($221^\circ \pm 4^\circ\text{F}$) for 60 ± 1 minutes. Determine the L value of the coating in accordance with ASTM-D2244. This will be value "B" (see 4.6.8.5).

4.6.8.4 Cleaning compound. Prepare the cleaner (MIL-C-85570, Type II, control formulation) by mixing these compounds in the following order:

Component	Parts by weight	Supplier (see 6.6)
Neodol 91-2.5	8.5	Shell
Neodol 91-6	18.4	Shell
Monamid 150-CW	15.0	Mona
Monateric 1000	1.0	Mona
Sandocorin 8132	0.7	Clariant
Benzotriazole	0.7	Fisher
Hostacor 2098	0.7	Hoechst Celanese
Water	55.0	
Total	100.0	

Directions: Blend components in the order given until homogeneous. Final pH should be in the range of 9.5 to 10.0. See 6.10.3 for information on obtaining the above listed items.

4.6.8.5 Procedure. Within 4 hours of soiling the test panels, conduct the cleanability test in the following manner:

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- a. Mix 1 part cleaner to 14 parts reagent water (by volume) at room temperature.
- b. Prepare a template (see figure 1) to anchor the test panel to the wear tester at a 45° angle to the stroke of the sponge.
- c. Place a soiled test panel in the template.
- d. Mount the template and test panel in a wear tester, such as the Gardner Heavy Duty Wear Tester (see 6.10.1), fitted with a cellulose sponge (see 6.10.2) in place of the wear surface. NOTE: Cut the sponge such that the dimension parallel to the cleaning stroke is 3.5 in. (90 mm) and the width is 2.75 in. (70.0 mm). The combined weight of the dry sponge and the cleaning head of the wear tester shall be a minimum of 1350 grams and a maximum of 1400 grams. It is recommended that Velcro-type strips be used to attach the nylon web side of the sponge to the cleaning head.
- e. Saturate the sponge with the diluted cleaning compound and pour the diluted cleaner on the test panel such that the coating is completely covered. Allow the cleaner to dwell on the coating for 60 ± 5 seconds.
- f. Clean the test panel using 5 cycles of the wear tester. Immediately turn the test panel 90° in the template and clean for an additional 5 cycles.
- g. Remove the test panel and rinse it under a flowing stream of water at room temperature.
- h. Allow the test panel to air dry and, using ASTM D2244, determine the L value of the coating. This will be value "C."

4.6.8.6 Calculation. Calculate the cleaning efficiency achieved on each test panel as follows (value "A" from 4.6.8.2, value "B" from 4.6.8.3, and value "C" from 4.6.8.5:

$$\text{Cleaning efficiency (\%)} = [(C - B) + (A - B)] \times 100;$$

Examine for conformance to 3.9.3.

4.6.9 Strippability. Test panels, prepared as directed in 4.5 and weathered for no less than 500 hours as directed in 4.6.4 shall be placed on a rack at a 60° angle with the horizontal. Enough paint remover conforming to MIL-R-81294, type I or II, shall be poured along the upper edge of each test panel to completely cover the coating surface. After no less than 60 minutes of exposure, the loosened coating shall be brushed off, and the test panels shall be rinsed while brushing under a stream of cool water. Examine for conformance to 3.9.4. The amount of coating stripped in this manner is determined by the percentage of substrate surface area exposed.

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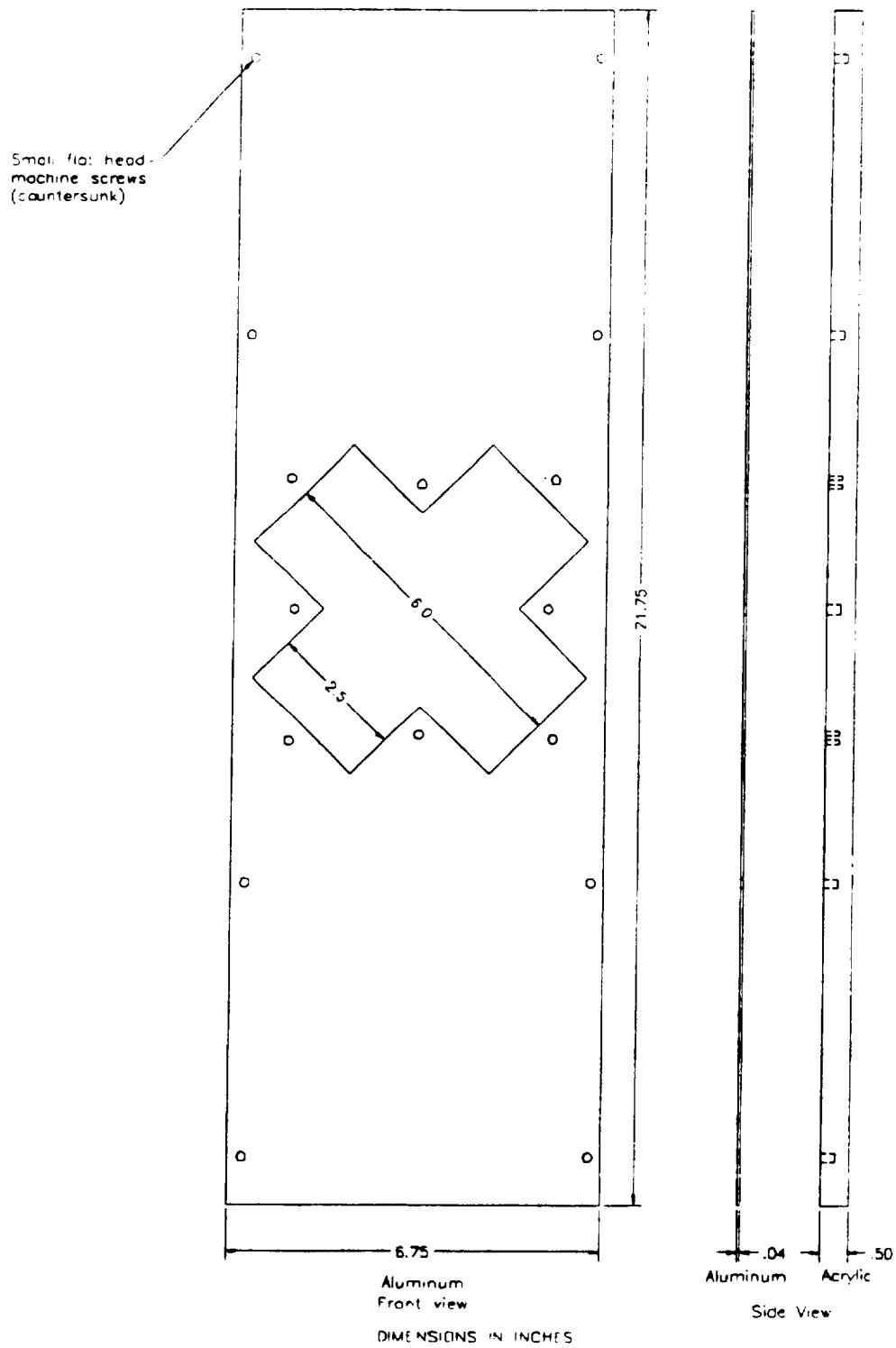


FIGURE 1. Test panel holder for cleanability test.

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5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. 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. Type I of this high-solids, polyurethane coating is intended for exterior use on aircraft weapons systems and other applications. Type II is intended for use on ground support equipment. No additives other than the appropriate thinner to obtain the proper spray viscosity need to be added.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification, including any amendments.
- b. Issue of DoDISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced (see 2.2 and 2.3).
- c. Kit desired, including the quantity and size of containers (see 6.9.1).
- d. Color number and name (see 6.9.2).
- e. Test/inspection reports and certifications required (4.4.1).
- f. If a retention sample is required and where to send it (see 4.4.2).

6.3 Toxicity. Some free isocyanate is released during mixing and application of multi-component polyurethane coatings. Released free isocyanates can produce significant irritation to the skin, eyes, and respiratory tract. Personnel exposed to free isocyanates may develop an allergic pulmonary sensitization, particularly if there is any inhalation of the vapor and mist produced during spray application. This sensitization may cause an asthmatic reaction with wheezing, dyspnea, and cough. Once sensitized, further exposure cannot be tolerated. For this reason, there is a restriction on the issuance and use of this material. Personnel exposed to free isocyanates on a regular basis should receive a periodic medical exam that includes a chest roentgenograph (X-ray), pulmonary function tests, and an evaluation of any respiratory disease or history of allergy. Periodic testing of pulmonary functions may aid in detecting the onset of pulmonary sensitization.

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6.3.1 Personnel protective methods. Eye protection and appropriate clothing to prevent repeated or prolonged skin contact should be worn while applying material that contains free isocyanates. Additional information pertaining to protective equipment and other necessary precautions should be available from the coating application facility's Occupational Safety and Health Office.

6.4 Moisture. Polyurethane materials should be kept dry. The presence of moisture degrades the quality of the coating. Packaging of the materials should be done in a dry atmosphere. Solvents and resins should be examined for evidence of contamination before they are incorporated, even if they are "urethane grade," as solvents and thinners may become contaminated with water in tank cars or storage tanks. The purchase of "urethane grade" solvents and thinners is no guarantee that excessive moisture is not present. It is recommended that all users check for moisture contamination prior to use.

6.4.1 Method to detect water in solvent used for polyurethane coatings. The following is a suggested method that may be used to determine the presence of water in the solvents used for polyurethane coatings: Add one drop of aluminum secondary butoxide to 100 ml of the solvent in a stoppered flask and shake well. An appreciable amount of turbidity indicates the presence of water.

6.5 Composition of isocyanate components. It is suggested that no methyl-ethyl-ketone (MEK) be used in the isocyanate component. It may degrade the isocyanate portion of the resin.

6.6 Safely handling methyl-ethyl-ketone (MEK) solvent. To minimize exposure to MEK solvent, it is recommended that personnel conducting the solvent resistant (cure) test (see 4.6.9) wear either butyl rubber or polytetrafluoroethylene (Teflon) gloves and a half- or full-face respirator equipped with organic vapor cartridges.

6.7 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-85285, 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 having the products that they propose to offer to the federal government tested for qualification so that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Commander, Naval Air Systems Command (AIR-4.3.4), Arlington, VA 22243. Information pertaining to qualification of products may be obtained from the Commander, Naval Air Warfare Center Aircraft Division, Attn.: Code 4.3.4.1, Building 2188, 22347 Cedar Point Road, Unit 5, Patuxent River, MD 20670-1161

6.7.1 Retention of qualification. To retain qualification of products approved for listing on the Qualified Products List (QPL), the manufacturer will be requested to verify by certification to the qualifying activity that its product(s) comply with the requirements of this specification. Unless otherwise specified by the qualifying activity, the time of periodic verification by

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certification will be in two-year intervals from the date of original qualification and will be initiated by the qualifying activity.

6.8 Material Safety Data Sheet (MSDS). 29 CFR 1910.1200 requires that the MSDS for each hazardous chemical used in an operation must be readily available to personnel using the material. Contracting officers should identify the activities requiring copies of the MSDS.

6.9 Part or Identifying Number (PIN). Part numbers may be coded as follows:

<u>M85285</u>	-	<u>X</u>	-	<u>XXX</u>	-	<u>XXXXX</u>
Specification identifier		Type 1=Type I 2=Type II		Kit size designator (see 6.9.1)		Color designator (see 6.9.2)

6.9.1 Kit size designation codes. The four digit kit size designation in the part number assignment should be as follows:

Kit size	Kit size designator
4 pint (1.88 liter)	04P
4 quart (3.76 liter)	04Q
4 gallon (15.14 liter)	04G
20 gallon (75.7 liter)	20G

The kit size and designator may be modified for ease of procurement and is not otherwise limited.

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6.9.2 Color designation codes: The five digit color designator is the FED-STD-595 color number. The following is a list of colors frequently used by the Department of Defense, but is not a list of all of the colors authorized, used, or available:

Color type:	FED-STD-595 color number	Color name
Gloss:	11136	Red
	13538	Orange-yellow
	14187	Green
	15044	Insignia blue
	15180	Blue
	16440	Light gray
	17038	Black
Semi-gloss:	17925	Untinted white
	25200	Blue
Camouflage (low gloss)	26231	Gray
	34095	Field green
	34097	Green
	35237	Blue gray
	36081	Flat gray
	36231	Lusterless gray
	36320	Dark gray
	36375	Medium gray
	36440	Light gray
	36495	Aircraft gray
37038	Black	

6.10 Cleanability test information. A source for the carbon black is the Columbian Chemical Company, 1600 Parkwood Circle, Suite 400, Atlanta, GA 30339 (telephone (800) 257-5076) under the trade name Raven 1040. Alconox Detergent is supplied by Alconox, Inc., 9E. 40th St., Suite 200, New York, NY 10016-0402 (telephone (212) 532-4040). Other products may provide equivalent performance.

6.10.1 Artificial soil information. Carbon black may be obtained from Columbian Chemical Company, 1600 Parkwood Circle, Suite 400, Atlanta, GA 30339 (phone 800-257-5076) under the trade name Raven 1040. Alconox Detergent is supplied by Alconox, Inc., 9E. 40th St., Suite 200, New York, NY 10016-0402 (phone 212-532-4040). Other products may provide equivalent performance.

6.10.2 Cellulose sponge information. Cellulose sponges (3M catalog #63) may be obtained from 3M, 3M Center, Bldg 223-3E-04, St. Paul, MN 55133 (telephone 800-852-9722). Other products determined to be equivalent may be used as a substitute.

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6.10.3 Cleaner component manufacturers. The following companies have been identified as vendors for the products used in 4.6.11.2.2. Other products may provide equivalent performance.

Shell One Shell Plaza Houston, TX 77002	Clariant 4000 Monroe Road Charlotte, NC 28205	Mona Industries, Inc. 76 E. 24th St. PO Box 425 Paterson, NJ 07544 201-345-8220	Hoechst-Celanese Corp. Colorants and Surfactants 5200-77 Center Drive Suite 220 Charlotte, NC 28217 800-255-6189 214-277-4000
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6.10.4 Wear tester and impact-flexibility tester information. The GE Impact-Flexibility Tester may be obtained from the Paul N. Gardner Co., Inc., 316 NE 1st St. Pompano Beach, FL 33060 (telephone (800) 762-2478).

6.11 Subject term (key word) listing.

Aliphatic polyurethane
Exterior use
Flammable
Isocyanate

6.12 Special application solutions. Procuring activities may request minor solvent and/or additive modifications to qualified products to solve unique application problems, such as faster drying time and shorter pot-life coatings are encountered for plural-component spray equipment. Only application conditions are permitted to be modified. The cured coating (dry film) properties of the coating are not permitted to be changed. Any modified coatings must be clearly identified as such on its container and may only be furnished to the requesting activity. The specific modifications and labeling instructions should be detailed in any procurement request for the modified material.

6.13 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.

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CONCLUDING MATERIAL

Custodians:

Army - MR
Navy - AS
Air Force - 99

Preparing activity :

Navy - AS
(Project 8010-0978)

Review Activities:

Army - AR, AV
Navy - CG, MC, SH
Air Force - 11, 84
Misc - DS

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.
 NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER

MIL-PRF-85285C

2. DOCUMENT DATE

(YYMMDD)

970430

3. DOCUMENT TITLE

COATING: POLYURETHANE, HIGH-SOLIDS

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrites, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)

d. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (Include Area Code)

(1) Commercial

7. DATE SUBMITTED

(YYMMDD)

(2) DSN (if applicable)

3. PREPARING ACTIVITY

a. NAME

COMMANDER
NAVAL AIR WARFARE CENTER
AIRCRAFT DIVISION

b. TELEPHONE NUMBER (Include Area Code)

(1) Commercial

(2) DSN

(808) 323-2847

674-2947

c. ADDRESS (Include Zip Code)

CODE 414100B120-3
HIGHWAY 547
LAKEMURST, NJ 08733-5100

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:
Defense Quality and Standardization Office, 5203 Leesburg Pike
Suite 1403, Falls Church, VA 22041-3466
Telephone (703) 756-2340 DSN 289-2340

