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31 MAY 1994
SUPERSEDING
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MILITARY SPECIFICATION

COATING, EPOXY, 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 two component, high solids epoxy coating with a maximum volatile organic compound (VOC) content of 340 grams/liter (g/l) (2.8 pounds/gallon (lbs/gal)). The coating is supplied as a kit.

1.2 Colors. The color and gloss of the coating is available in a wide variety of colors. This specification does not limit the suppliable colors, nor does it list all available colors. The coating colors are designated by FED-STD-595. The FED-STD-595 color number forms a part of the part number designation (see 6.10).

1.3 Part numbers. Part numbers, for cataloging purposes, may be assigned in accordance with 6.10.

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 SR3, 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.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. 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

MILITARY

MIL-C-5541	-	Chemical Conversion Coatings on Aluminum and Aluminum Alloys
MIL-A-8625	-	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-P-23377	-	Primer Coatings: Epoxy, Chemical and Solvent Resistant
MIL-L-23699	-	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base, NATO Code Number O-156
MIL-D-50030	-	Decontaminating Agent, DS2
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-P-85582	-	Primer Coatings: Epoxy, Waterborne

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

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes

(Unless otherwise indicated, copies of federal and military specifications and standards are available from DODSSP - Customer Service, Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents. The following other Government documents 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 (CFR)

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

Title 29, Part 1910.1200 (29 CFR 1910.1200) - Occupational Safety and Health Standards - Hazard Communications

DEPARTMENT OF TRANSPORTATION

Title 49, Parts 171-178 (49 CFR 171-178) - Hazardous Materials Regulations

(Application of copies of the Code of Federal Regulations (CFR) should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

2.2 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).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

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

(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	-	Standard Test Methods for Coarse Particles in Pigments, Pastes and Paints
ASTM D522	-	Standard Test Method for Mandrel Bend Test of Attached Organic Coatings
ASTM D523	-	Standard Test Method for Specular Gloss
ASTM D823	-	Standard Test Methods for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels
ASTM D1200	-	Standard Test Method for Viscosity of Paints, Varnishes and Lacquers by Ford Viscosity Cup
ASTM D1210	-	Standard Test Method for Fineness of Dispersion of Pigment-Vehicle Systems
ASTM D1296	-	Standard Test Method for Odor of Volatile Solvents and Diluents
ASTM D1640	-	Standard Test Method for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature
ASTM D2244	-	Standard Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates
ASTM D3335	-	Standard Test Method for Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy
ASTM D3718	-	Standard Test Method for Low Concentrations of Chromium in Paint by Atomic Absorption Spectroscopy
ASTM D3924	-	Specification for Standard Environment for Conditioning and Testing of Paint, Varnish, Lacquer, and Related Materials
ASTM D3960	-	Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
ASTM E275	-	Standard Practice for Describing and Measuring Performance of Ultraviolet, Visible, and Near-Infrared Spectrophotometers
ASTM G26	-	Standard Practice of Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

2.3 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 which are authorized by the qualification activity for listing on the applicable Qualified Products List (QPL) at the time set for award of contract (see 4.3 and 6.4). Any change in the formulation or manufacturing process of a qualified product will necessitate its requalification. The material supplied under contract shall be identical, within manufacturing tolerances, to the product receiving qualification.

3.2 Material. Materials used to manufacture coatings supplied under this specification shall be of such a quality as to produce coatings conforming to the requirements of this specification.

3.3 Toxicity. The manufacturer shall certify (see 6.3) that the coatings supplied under this specification have no adverse effect on the health of personnel when used for its intended purpose and with the precautions listed in 5.2.1. A Material Safety Data Sheet (MSDS) shall be prepared and submitted in accordance with FED-STD-313. The MSDS shall also meet the requirements of 29 CFR 1910.1200 (see 6.6). Questions pertinent to the effect(s) of these coatings on the health of personnel using them shall be referred by the procuring activity to the appropriate medical service, who will act as its adviser.

3.4 Composition. The coating shall consist of two components, as follows:

Component A - epoxy resin and solvents
Component B - polyamide and/or amine resin(s) and solvents

Component B shall act as the curing agent for Component A. The components shall be packaged separately and furnished as a kit (see 5.1). Pigments may be included with either component. When the components are mixed in the proportions specified by the manufacturer, a product meeting the requirements of this specification shall result. Chlorinated solvents are prohibited from the formulation of this coating. When tested in accordance with ASTM D3335 (see 4.6 and Table I), 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 (see 4.6 and Table I), no component of this coating shall contain chromium.

3.4.1 Pigments. Pigments used in the formulation of this coating shall not contain lead, lead compounds, cadmium, or cadmium compounds (see 3.4). The pigments used shall have proven outdoor durability (see 3.8.7). In addition, the pigments in the coating shall be sufficiently insoluble to prevent leaching when immersed in distilled water maintained at 49° ± 3°C (120° ± 5°F) for four days (the water shall remain clear) (see 3.8.6).

3.4.2 Volatile organic compound (VOC) content. The maximum VOC content of the coating at application viscosity shall be 340 g/l (2.8 lbs/gal), when tested in accordance with ASTM D3960 (see 4.6 and Table I).

3.4.2.1 Thinner compatibility. The admixed coating shall be compatible with thinner conforming to MIL-T-81772, Type II (see 6.9). The resistivity of the solvents shall be suitable for electrostatic spray application.

3.5 Physical properties-individual components.

3.5.1 Condition in container. After standing without agitation for a minimum of 14 days, components "A" and "B" shall be capable of being mixed by vigorously stirring with a hand paddle (within 5 minutes) to a smooth, homogeneous, pourable condition, when tested in accordance with 4.6.1. In addition, the material shall be free of grit, seeds, lumps, abnormal thickening or livering, and shall not exhibit pigment floatation or excessive settling that cannot be reincorporated to a smooth, homogeneous state by mixing with a hand paddle. In addition, the containers shall exhibit no deformation due to internal pressure, when examined in accordance with 4.4.3.2.

3.5.2 Storage stability. The coating components, as packaged by the manufacturer, shall be capable of meeting all requirements specified herein for a minimum of one year from the date of manufacture, when tested in accordance with FED-STD-141, Method 3022, at a daily ambient air temperature of 1.7° to 46°C (35° to 115°F) (see 4.6 and Table I).

3.5.3 Accelerated storage stability. The sealed coating components, as packaged by the manufacturer and tested in accordance with 4.6.2, shall be capable of being stored for a minimum of 14 consecutive days at 52° ± 2°C (125° ± 3°F) without developing increased internal container pressure upon returning to room temperature. After this storage period, the contained material shall be free of lumps, skins, gels, or particulate matter, either suspended in solution or settled on the inner surface of the container, and, when stirred with a paddle, the contained material shall be a smooth, homogeneous mixture. In addition, the coating shall be capable of being applied to a smooth, uniform film, free of grains, lumps, and streaks, in accordance with 4.5.2.

3.6 Physical properties-admixed components.

3.6.1 Fineness of grind. The fineness of grind (on the Hegman scale) of the admixed coating, when tested in accordance with ASTM D1210 (see 4.6 and Table I) one hour after mixing, shall be a minimum of 7 for gloss colors, 6 for semi-gloss colors, and 5 for camouflage colors.

3.6.2 Coarse particles. The admixed coating, when tested in accordance with ASTM D185, shall contain a maximum of 0.5 percent by weight of particles retained on a number 325 sieve (see 4.6 and Table I).

3.6.3 Odor. The odor of the admixed coating, wet or dry, shall not be obnoxious, when tested in accordance with ASTM D1296 (see 4.6 and Table I). In addition, the air-dried film shall retain no residual odor 48 hours after application.

3.6.4 Viscosity. The viscosity of the admixed coating, after thinning to a maximum VOC of 340 g/l (2.8 lbs/gal), if necessary, shall not exceed 50 seconds through a number 4 Ford Viscosity Cup, when tested in accordance with ASTM D1200 (see 4.6 and Table I).

3.6.5 Pot life. After four hours in a closed container, the viscosity of the admixed and thinned coating, if required, from 3.6.4 shall not exceed 70 seconds through a number 4 Ford Viscosity Cup, when tested in accordance with ASTM D1200 (see 4.6 and Table I,. Additionally, the coating shall not gel within 8 hours of mixing.

3.7 Physical properties - film.

3.7.1 Drying time. The coating, applied to test panels in accordance with 4.5 through 4.5.2 shall be set-to-touch within four hours and dry-hard within eight hours, when tested in accordance with ASTM D1640 (see 4.6 and Table I).

3.7.2 Surface appearance. The coating shall dry to a smooth, uniform surface, free from runs, sags, bubbling, streaks, hazing, seeding, dusting, floating, mottling, or other film defect when applied to test panels in accordance with 4.5 through 4.5.2.

3.7.3 Color. The color of the coating, applied to test panels in accordance with 4.5 through 4.5.2 and air-dried for 24 hours, shall match the specified FED-STD-595 color number (Delta E value less than 1), when tested in accordance with ASTM D2244 (see 4.6 and Table I).

3.7.4 Infrared reflectance (color number 34095 only). The applied coating (FED-STD-595, color number 34095) shall conform to the following limits, when tested in accordance with 4.6.3, relative to barium sulfate:

Wavelength (nanometers (nm))	Maximum reflectance (percent)
450 - 500	8
500 - 600	10
600 - 2700	8

3.7.5 Gloss. The coating, applied to test panels in accordance with 4.5 through 4.5.2, shall have the following specular gloss, when tested in accordance with ASTM D523: (a) a maximum 85° specular gloss of 9 for camouflage colors; (b) the 60° specular gloss shall be as follows:

Color type	Minimum	Maximum
Gloss	90	---
Semi-gloss	15	30
Camouflage	---	5

3.7.6 Hiding power. When tested on a black and white paper chart (at a dry-film thickness of 1.7 to 2.3 mils (43 to 58 μm)), in accordance with 4.6.4, the contrast ratio (C) of the coating shall be as follows:

FED-STD-595 color number	Contrast ratio (C)
13538	minimum of 0.90
All other colors	minimum of 0.95

3.7.7 Adhesion. The coating, applied to test panels in accordance with 4.5 through 4.5.2, shall not peel away from the primer coating after immersion in water and tested in accordance with FED-STD-141, Method 6301 (see 4.6 and Table I).

3.7.8 Flexibility. The coating, applied to test panels in accordance with 4.5 through 4.5.2, shall exhibit no cracking, peeling, or loss of adhesion when bent over a 1 in. (25 mm) mandrel, in accordance with ASTM D522, Method B, "Cylindrical Mandrel Test" (see 4.6 and Table I).

3.8 Resistance properties.

3.8.1 Fluid resistance. The applied coating, when tested in accordance with 4.6.5, shall withstand immersion for 24 hours in the following fluids at the specified temperatures: MIL-L-23699 lubricating oil at 121° ± 3°C (250° ± 5°F); MIL-H-83282 hydraulic fluid at 65.5° ± 3°C (150° ± 5°F). Four hours after removal, the film shall not exhibit any blistering, softening, dark staining, or other film defects.

3.8.2 Heat resistance (color change). The applied coating shall be capable of withstanding exposure to 121°C (250°F) for 1 hour, in accordance with 4.6.6, without experiencing a color change (Delta E, calculated with respect to the Hunter values), value greater than 2.0, when tested in accordance with ASTM D2244.

3.8.3 Solvent resistance (cure). The applied coating, when tested in accordance with 4.6.7, shall be capable of withstanding a minimum of 50 passes with a rag soaked in methyl ethyl ketone (MEK) solvent without exposing the substrate.

3.8.4 Tape resistance. The applied coating, when tested in accordance with 4.6.8, shall not exhibit permanent marring by masking tape applied to the coating after eight hours air-dry.

3.8.5 DS2 resistance. The applied coating, when exposed to decontaminating solution DS2 (conforming to MIL-D-50030) in accordance with 4.6.9, shall exhibit no blistering, wrinkling, or film softening when examined immediately after washing with water.

3.8.6 Water resistance. The applied coating, after immersion in distilled water (maintained at 49° ± 3°C (120° ± 5°F)) for 4 days, shall not blister, when tested in accordance with 4.6.10, nor shall the pigment leach out of the dried film (the water shall remain clear) (see 3.4.1).

3.8.7 Weather resistance. The applied coating shall be exposed for 500 hours in a 6000 watt xenon-arc weatherometer and shall show no color change (Delta E, calculated with respect to the Hunter values, greater than 3.0), when tested in accordance with 4.6.11 and ASTM D2244.

3.9 Working properties.

3.9.1 Mixing. Component B shall readily mix with Component A to produce a smooth, homogenous fluid.

3.9.2 Application. When Components A and B are mixed and thinned, if necessary (see 6.9), the material shall be homogeneous and sprayable to a smooth, uniform film, in accordance with 4.5.2.

3.10 Strippability. The applied and cured coating, after baking at 149° ± 3°C (300° ± 5°F) for four hours, tested in accordance with 4.6.12, shall be have at least 90 percent of the coating stripped within 60 minutes with the use of remover conforming to MIL-R-81294, Type I.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facility suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

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

a. Qualification inspection (see 4.3).
b. Quality conformance inspection (see 4.4).

4.3 Qualification inspection. Qualification inspection shall consist of all requirements and tests specified in section 3.

4.3.1 Qualification samples. Qualification test samples shall consist of a minimum of one quart of each component in the following FED-STD-595 color numbers: 17925, 34095 and 36375. The material shall be furnished in containers of the type 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 6.4).

- Qualification test samples.
- Specification MIL-C-22750F
- Coating, Epoxy, High-Solids
- FED-STD-595, Color number _____
- 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.

4.3.3 Retention of qualification. In order to obtain qualification of products approved for listing on the Qualified Products List (QPL), the manufacturer shall 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 certification shall be in two-year intervals from the date of

original qualification. The certification action shall be initiated by the qualifying activity.

4.4 Quality conformance inspection.

4.4.1 Lot formation. A lot shall consist of all coating of the same color, manufactured at one time from one batch, forming part of one contract, and submitted for acceptance. A batch shall consist of all coating material manufactured during one continuous operation.

4.4.2 Batch data. When required (see 6.2), the manufacturer shall furnish with each batch and/or lot a certified test report (see 6.3) showing that the material has satisfactorily passed the quality conformance inspection (see 4.4.3). When required (see 6.2), the manufacturer shall certify that there has been no formulation or process change from that which resulted in the production of the qualification inspection sample.

4.4.3 Quality conformance examinations.

4.4.3.1 Tests. The examination shall consist of all the tests specified in 3.5, 3.6, 3.7, and 3.9 with the exception of storage stability (3.5.2). There shall be no failures. Samples for tests shall consist of one complete unopened kit selected at random from each batch. Containers shall only be opened when being tested.

4.4.3.2 Examination of packaging and marking. An examination shall be made to determine that the packaging, marking, and container closure comply with the requirements of section 5. Samples units shall be selected from each lot in accordance with MIL-STD-105, inspection level S-2. The lot size for this examination shall be the number of kits fully prepared for delivery. Prior to palletization, kits fully prepared for delivery shall be examined for defects of closure. Acceptance criteria shall be as specified in the contract or purchase order (see 6.2 and 6.7). Defects shall be scored in accordance with the list below.

Examine	Defect
Packaging	Containers not as specified, closures not accomplished by specified or required methods or materials. Leakage or seepage of contents. Non-conforming component, component missing, damaged or otherwise defective. Rusted, bulged or distorted container.
Marking	Data, including directions for use, omitted, illegible, incorrect, incomplete, or not in accordance with contract requirements.

4.4.3.3 Visual inspection of filled containers. Samples selected at random for examination in accordance with 4.4.3.2 shall be examined for proper filling and weight, and excessive internal pressure.

4.4.3.4 Examination for palletization. An examination shall be made to determine that palletization complies with the requirements of Section 5 of this specification. Samples units shall be selected from each lot in accordance with MIL-STD-105, inspection level S-1. The lot size shall be the number of palletized unit loads prepared for delivery. Acceptance criteria shall be as specified in the contract or purchase order (see 6.2 and 6.8). Defects shall be scored in accordance with the list below.

Examine	Defect
Finished dimension	Length, width or height exceeds specified maximum requirement.
Palletization	Not as specified. Pallet pattern not as specified. Interlocking of loads not as specified. Load not bonded with required straps as specified.
Weight	Exceeds maximum load limits.
Marking	Omitted, incorrect, illegible, of improper size, location, sequence or method of application.

4.4.4 Rejection and retest. Failure in any quality conformance test shall result in the rejection of that batch and shall constitute sufficient justification for removal from the qualified products list. Rejected material shall not be resubmitted for acceptance without written approval from the Commander, Naval Air Warfare Center - Aircraft Division, Code 6062, Box 5152, Warminster, PA 18974-0591. 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 (see 4.4.3) and forwarded to the designated testing activity.

4.5 Test panels. Test panels shall be prepared under laboratory conditions (see 4.6). With the exception of the flexibility test, all panels for test purposes shall be aluminum alloy 2024 (T3 temper) conforming to QQ-A-250/4, with dimensions of 0.020 by 3 by 6 in. (0.50 by 76.2 by 152.4 mm). Test panels for the flexibility test shall be aluminum alloy 2024 (O temper), anodized in accordance with MIL-A-8625, Type I. Test panel dimension shall be the same as above.

4.5.1 Panel preparation. With the exception of the test panels used for the flexibility test, all test panels shall be treated to produce coatings conforming to MIL-C-5541, Class 1A or 3. On all test panels, primer coating conforming to MIL-P-23377 or MIL-P-85582 shall be spray applied in accordance with ASTM D823, Method A or D, to a dry-film thickness of 0.6 to 0.9 mils (15 to 23 micrometers (μm)). Allow the primer coating to air-dry for 2 hours prior to application of the topcoat.

4.5.2 Application of coating. The coating under test shall be admixed and allowed to stand for 30 minutes prior to use. The coating shall then be spray applied to the test panels in accordance with ASTM D823, Method A or D,

to a dry-film thickness of 1.7 to 2.3 mils (43 to 58 µm) in two coats. Allow 15 minutes between application of the two coats. With exception of the tape resistance test (see 4.6.8) and the DS2 resistance test (see 4.6.9), the test panels shall be (a) air-dried for a minimum of 14 days prior to testing, or (b) air-dried for 24 hours, followed by drying at 150° ± 5°F (65.5° ± 2°C) for 24 hours.

4.6 Test methods. The tests of this specification shall be conducted in accordance with Table I and paragraphs 4.6.1 through 4.6.12, with test panels, when directed, prepared in accordance with 4.5 through 4.5.2. Unless otherwise specified in the test method or paragraph, all testing shall be conducted under laboratory test conditions in accordance with ASTM D3924.

TABLE I. Test methods.

Requirement paragraph	Test	Test paragraph	FED-STD-141 Method number	ASTM Test Method
3.4	Chromium	--	--	D3718
3.4	Lead and cadmium content	--	--	D3335
3.4.2	Volatile content	--	--	D3960
3.5.1	Condition in container	4.6.1	--	--
3.5.2	Storage stability	--	3022 1/	--
3.5.3	Accelerated storage stability	4.6.2	--	--
3.6.1	Fineness of grind	--	--	D1210
3.6.2	Coarse particles	--	--	D185
3.6.3	Odor	--	--	D1296
3.6.4, 3.6.5	Viscosity, pot life	--	--	D1200
3.7.1	Drying time	--	--	D1640
3.7.3	Color	--	--	D2244
3.7.4	Infrared reflectance (Color number 34095 only)	4.6.3	--	--
3.7.5	Gloss	--	--	D523
3.7.6	Hiding power	4.6.4	--	--

TABLE I. Test methods, continued.

Requirement paragraph	Test	Test paragraph	FED-STD-141 Method number	ASTM Test Method
3.7.7	Adhesion	--	6301	--
3.7.8	Flexibility	--	--	D522 2/
3.8.1	Fluid resistance	4.6.5	--	--
3.8.2	Heat resistance (color change)	4.6.6	--	D2244
3.8.3	Solvent resistance (cure)	4.6.7	--	--
3.8.4	Tape resistance	4.6.8	--	--
3.8.5	DS2 resistance	4.6.9	--	--
3.8.6	Water resistance	4.6.10	--	--
3.8.7	Weather resistance	4.6.11	--	D2244
3.9.2	Application	4.5.2	--	--
3.10	Strippability	4.6.12	--	--

1/ The daily ambient air temperature at the storage location shall be 1.7° to 46°C (35° to 115°F).
2/ Method B

4.6.1 Condition in container. Allow each component to stand without agitation for a minimum of 14 days. After this period, examine each container's contents for conformance to 3.5.1.

4.6.2 Accelerated storage stability. Full, unopened, sealed container(s) of each component shall be stored for a minimum of 14 consecutive days in a location maintained at 52° ± 2°C (125° ± 3°F). At the end of the 14 day period, the containers shall be allowed to cool to room temperature. (During the storage period, it is advised that the unopened containers be placed in larger, vented containers to confine any splash that may occur if the lid of the unopened container is blown off by gassing.) If, upon removal from storage, the unopened container is deformed, do not open and discard. If it is not deformed, open the container carefully and examine its contents for conformance to 3.5.3.

4.6.3 Infrared reflectance. The coating shall be applied to test panels in accordance with 4.5 through 4.5.2. The total reflectance (specular and diffuse) of the applied coating shall be measured relative to barium sulfate with a Perkin-Elmer LAMBDA 9 spectrophotometer (or equivalent (ASTM E275 may be used to compare performance of the equivalent unit to the LAMBDA 9)) and examined for conformance to 3.7.4.

4.6.4 Hiding power. Apply the coating to a dry film thickness of 1.7 to 2.3 mils (43 to 58 µm) on a black and white paper chart (Leneta Form 3B, or equivalent (see 6.12)) . The hiding power of the coating shall be measured as follows:

a. Using ASTM D2244, determine the Hunter L_H value of the coating on the black and the white portions of the chart, respectively.

b. Calculate the contrast ratio (C), as follows:

$C = L_H$ for the black portion ÷ L_H for the white portion

c. Examine for conformance to 3.7.6.

4.6.5 Fluid resistance. The coating, applied to test panels in accordance with 4.5 through 4.5.2, shall be separately immersed for 24 hours in the following:

a. Lubricating oil conforming to MIL-L-23699, maintained at 121° ± 3°C (250° ± 5°F).
b. Hydraulic fluid conforming to MIL-H-83282, maintained at 65.5° ± 3°C (150° ± 5°F).

After removal from the fluids, allow the coating to cool to room temperature and examine for conformance to 3.8.1.

4.6.6 Heat resistance (color change). The coating shall be applied to test panels in accordance with 4.5 through 4.5.2. The coated test panels shall then be baked at 121° ± 3°C (250° ± 5°F) for one hour. After baking, allow the coated test panels to cool to room temperature and examine the coating in accordance with ASTM D2244 for conformance to 3.8.2.

4.6.7 Solvent resistance (cure). The coating, applied to test panel in accordance with 4.5 through 4.5.2, shall be examined for cure, as follows:

a. Soak a cotton, terrycloth rag in MEK solvent (see 6.11).
b. Rub the coating with the soaked rag for 50 passes (25 times) with firm finger pressure.
c. Examine coating for conformance to 3.8.3.

4.6.8 Tape resistance. The coating, applied to test panels in accordance with 4.5 through 4.5.2 and air-dried for eight hours, shall have a 1 inch (25.4 mm) strip of masking tape (3M Company, #250, or equivalent)

applied to it, adhesive side down, and then pressed down with one pass of a 4.5 pound (lb) (2.04 kilogram (kg)) roller. The tape shall remain in contact with the coating for 1 hour, and then shall be removed. Examine the coating for conformance to 3.8.4.

4.6.9 DS2 resistance. The coating, applied to test panels in accordance with 4.5 through 4.5.2, shall be air-dried for 4 days, followed by 3 days at 105° ± 3°C (221° ± 5°F). After the panels have been cooled to room temperature, place two spots of 0.5 ml each of DS2 conforming to MIL-D-50030 on the coating surface. Allow it to stand uncovered for 30 minutes and then wash with water and examine for conformance to 3.8.5.

4.6.10 Water resistance. The coating, applied to test panels in accordance with 4.5 through 4.5.2, shall be placed in distilled water that is maintained at 49° ± 3°C (120° ± 5°F) for 4 days. After removal from the water, the coating shall be examined for conformance to 3.8.6.

4.6.11 Weather resistance. The coating shall be applied to separate sets of test panels in accordance with 4.5 through 4.5.2. One set of test panels shall be the unexposed control and the other set shall be placed in a 6000 watt weatherometer (see 6.11) that is cycling between 102 minutes of light only and 18 minutes of light and water spray, operated in accordance with ASTM G26, Method 1, "Continuous Exposure to Light and Intermittent Exposure to Water Spray." Total exposure time shall be 500 hours. The following conditions shall apply when testing:

Apparatus Type: BH
Black body temperature in cabinet: 60° ± 3°C (140° ± 5°F)
Relative humidity in cabinet: 50 ± 5%
Intensity of xenon-arc: 0.3 to 0.4 watts/meter^2 at 340 nm

After removal from the weatherometer, the color of the exposed coating shall be compared with the unexposed control in accordance with ASTM D2244 for conformance to 3.8.7.

4.6.12 Strippability. The coating shall be applied to test panels in accordance with 4.5 through 4.5.2. The test panels shall then be baked at 149° ± 3°C (300° ± 5°F) for 4 hours. After cooling to room temperature, place the test panels, coated side up, on a rack at 60° to the horizontal. Pour remover conforming to MIL-R-81294, Type I, along the upper edge of the test panels, ensuring that the entire coating surface is covered. Expose the coating to the remover for 60 minutes. Next, while rinsing under a stream of cool water, brush off the loosened film with a stiff, non-metallic, bristle brush. Determine the percentage of coating removed, by the following equation, and examine for conformance to 3.10:

$[As_1 + As_2] \times 100 =$ Percentage of coating removed

As_1 = Substrate surface area exposed (area stripped of coating)
As_2 = Total surface area of substrate

5. PREPARATION FOR DELIVERY

5.1 Packaging and packing. The coating shall be supplied as a kit, packaged as a unit consisting of Components A and B. The packaging, packing and marking for shipment shall be in accordance with PPP-P-1892 and as specified in 5.2. Multi-friction sealed cans shall be used. When specified (see 6.2), palletization is required for handling by mechanical equipment.

5.2 Marking and labeling. In addition to the marking specified in PPP-P-1892, individual cans and containers shall bear printed labels showing the following nomenclature and information, as applicable:

- Specification MIL-C-22750F
- Component _____ (A or B, as applicable)
- Color (name and number)
- Manufacturer's name and product number
- Date of manufacture by month and year
- Batch number
- VOC content in grams/liter
- Mixing instructions
- Maximum solvent addition (without exceeding 340 g/l)
- Net contents

5.2.1 Precautionary markings.

5.2.1.1 Container. All unit and intermediate packs of toxic and hazardous chemicals and materials shall be labeled in accordance with all applicable laws, statutes, regulations or ordinances, including Federal, state and municipal requirements and the applicable precautionary information detailed in ANSI Z129.1. In addition to labeling required by Title 49 CFR 171-178, the following labeling shall appear on each component container in every kit and on each exterior shipping container:

CAUTION
THIS COATING IS COMBUSTIBLE
DO NOT USE IN CONFINED AREAS,
WHERE THERE ARE OPEN FLAMES, ARCING EQUIPMENT,
HOT SURFACES, OR WHERE SMOKING IS PERMITTED.

USE ONLY WITH ADEQUATE VENTILATION.

AVOID BREATHING OF VAPOR.

DO NOT GET IN EYES, ON SKIN OR CLOTHING.
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN
WITH PLENTY OF WATER.

FOR CONTACT WITH EYES, GET MEDICAL ATTENTION.

The following is to be included on a printed sheet with each kit:

Precautions:

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 MEK solvent or thinner conforming to MIL-T-81772, Type II.
c. Mix only the amount of primer coating to be used within 4 hours. Use only the specified thinner. Keep containers closed when not in use.
d. Coating from one vendor, or individual component, shall never be mixed with that of another vendor, even of the same color. Components from different kits are not interchangeable. For example, component A in white may not be used with component B in gray.

6. NOTES

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

6.1 Intended use. This epoxy coating is intended for use as a topcoat on aircraft and ground support equipment. No additives other than the appropriate thinner to obtain the proper spray viscosity are to be added. This coating contains a maximum VOC of 340 g/l (2.8 lbs/gal).

6.2 Ordering data.

6.2.1 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 2.1 and 2.2).
c. Quantity and kit desired, including the color (specify number), kit size (see 6.10).
d. Data requirements (see 6.3).
e. Quantity and kit size (see 6.7.1).
f. Levels of packaging and packing required (see 5.1).
g. Marking and labeling required (see 5.2 through 5.2.1.2).
h. Specify if palletization is required.
i. Acceptance criteria (see 6.11 and 6.12).
j. FAR clauses 23.303 and 52.223-3.

6.3 Consideration of data requirement. The following Data Item Descriptions (DID's) must be listed, as applicable, on the Contract Data Requirements List (DD Form 1423) when this specification is applied on a contract, in order to obtain the data, except where DOD FAR Supplement 227.405-70 exempts the requirement for a DD Form 1423.

Reference Paragraph	DID Number	DID Title	Suggested Tailoring
4.3.2	DI-NOTI-80809A	Test/Inspection Reports	---
3.3, 4.3.2, 4.4.2	DI-MISC-80678	Certification Data Sheet	---
4.4.2	DI-R-4026	Quality conformance test report	Use contractor format

The above DID's were those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for award of contract, qualified for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualified Products List is: Commander, Naval Air Systems Command, Washington, D.C. 20361; however, information pertaining to qualification of products should be obtained from the Commander, Naval Air Warfare Center - Aircraft Division, Code 6062, Box 5152, Warminster, PA 18974-0591.

6.4.1 Extension of qualification for color. Once qualified for color numbers 17925 and 36375, qualification will extend to other gloss, semigloss, and camouflage colors, with the exception of color number 34095. Color number 34095 must be separately qualified.

6.5 Subject term (key word) listing.

High solids
Low-infrared reflectance
Methyl ethyl ketone
Spray application

6.6 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 will identify the activities requiring copies of the MSDS.

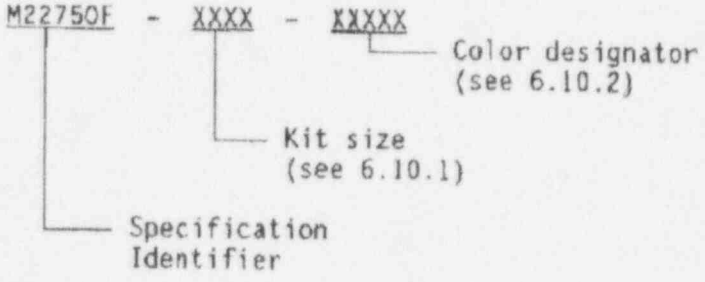
6.7 Acceptance criteria for packaging and marking. Previous revisions of this document specified an acceptable quality level (AQL) of 4.0 defects per hundred units, in accordance with MIL-STD-105.

6.8 Acceptance criteria for palletization. Previous revisions of this document specified an acceptable quality level (AQL) of 6.5 defects per hundred units, in accordance with MIL-STD-105.

6.9 Thinning. If it is necessary to add thinner to this coating:

(1) Use only thinner conforming to MIL-T-81772, Type II;
(2) In areas where air quality regulations restrict volatile emissions to less than 340 g/l (2.8 lbs/gal), do not add thinner if that addition will raise the VOC content of the coating to greater than 340 g/l (2.8 lbs/gal) of coating.

6.10 Part numbers. Part numbers for cataloging purposes under this specification may be coded as follows:



6.10.1 Kit size. The four digit kit size designation in the part number assignment is as follows:

Kit size	Kit size designator
4 pint (1.88 liter (l))	004P
4 quart (3.76 l)	004Q
4 gallon (15.14 l)	004G
20 gallon (75.7 l)	020G

6.10.2 Color designator. 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 under this specification.

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

6.11 Safely handling MEK solvent. To minimize exposure to MEK solvent, it is recommended that personnel conducting the solvent resistance (cure) test (see 4.6.7) wear either butyl rubber or Teflon gloves and a half-face respirator equipped with organic vapor cartridges.

6.12 Black and white paper chart source. The Leneta Form 3B, available from the Leneta Co. has been found suitable for the hiding power test (see 4.6.4). An equivalent paper chart may be used. The surface of the black and white paper chart must be smooth, level, and impervious to paint liquids. In addition, the black area must have a maximum reflectance of 1% and the white area must have a minimum reflectance of 76%.

6.13 Change from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian:
Army - ME
Navy - AS
Air Force - 99

Preparing activity:
Navy - AS
(Project No. 8010-0551)

Review:
Army - AR, AV, CR, EA, MI, MR
Navy - CG, MC, OS, SH
Air Force - 11, 84
Federal - OS