NOTE: The document identifier and heading has been changed on this page to reflect that this is a performance specification. There are no other changes to this document. The document identifier on subsequent pages has not been changed, but will be changed the next time this document is revised.

METRIC
MIL-PRF-24712
21 February 1989

PERFORMANCE SPECIFICATION

COATINGS, POWDERED EPOXY (METRIC)

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

1. SCOPE

1.1 Scope. This specification covers powdered epoxy coating for interior steel and aluminum equipment, furniture, and electrical box surfaces and on exterior steel and aluminum surfaces exposed to marine atmosphere, high humidity, seawater, and weathering.

1.2 Classification. Powdered epoxy coating covered by this specification shall be of the following types as specified (see 6.2).

Type I - For use on interior steel and aluminum surfaces.
Type II - For use on interior steel and aluminum surfaces.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those 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

L-P-378 - Plastic, Sheet and Strip, Thin Gauge, Polyolefin.
TT-T-548 - Toluene, Technical.
PPP-B-636 - Boxes, Shipping, Fiberboard.
PPP-F-320 - Fiberboard: Corrugated and Solid, Sheet Stock (Container Grade), and Cut Shapes.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 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

MILITARY

MIL-H-5606 - Hydraulic Fluid, Petroleum Base; Aircraft, Missile, and Ordnance.
MIL-L-19140 - Lumber and Plywood, Fire-Retardant Treated.

STANDARDS

FEDERAL

FED-STD-313 - Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities.
FED-STD-595 - Colors.

MILITARY

MIL-STD-2073-1 - DoD Materiel Procedures for Development and Application of Packaging Requirements.

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

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 SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 366 - Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality. (DoD adopted)
B 117 - Standard Method of Salt Spray (Fog) Testing. (DoD adopted)
B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate. (Metric) (DoD adopted)
D 149 - Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies. (DoD adopted)
D 523 - Standard Test Method for Specular Gloss. (DoD adopted)
D 792 - Standard Test Methods for Specific Gravity (Relative Density) and Density of Plastics by Displacement. (DoD adopted)
D 1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes. (DoD adopted)
D 1729 - Standard Practice for Visual Evaluation of Color Differences of Opaque Materials. (DoD adopted)
D 1737 - Standard Test Method for Elongation of Attached Organic Coatings with Cylindrical Mandrel Apparatus. (DoD adopted)
D 2247 - Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.

ASTM (Continued)

D 2248 - Standard Practice for Detergent Resistance of Organic Finishes.
D 2794 - Standard Test Method for the Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
D 3363 - Standard Test Method for Film Hardness by Pencil Test.
D 3652 - Standard Test Method for Thickness of Pressure-Sensitive and Gummed Tapes. (DoD adopted)
D 3924 - Standard Specification for Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials.
D 3951 - Standard Practice for Commercial Packaging. (DoD adopted)
D 4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
G 26 - Standard Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials. (DoD adopted)

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

STEEL STRUCTURES PAINTING COUNCIL (SSPC)
SP 10 - Near-White Blast Cleaning. (DoD adopted)

(Application for copies should be addressed to the Steel Structures Painting Council, 4400 Fifth Avenue, Pittsburgh, PA 15213.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

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 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.4) in accordance with 4.3.

3.2 Materials. The contractor's selection of raw material shall be in accordance with this specification (see 6.3).

3.2.1 Prohibited materials. There shall be no lead compounds, chromate and cadmium pigments or any carcinogenic or suspected carcinogenic compounds present in the formulations.

3.2.2 Toxic products and formulations. The material shall have no adverse effect on the health of the personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the contracting activity to the Naval Medical Command (NAVMEDCOM) who will act as an advisor to the contracting activity.

3.2.3 Material safety data sheet (MSDS). The contracting activity shall be provided a material safety data sheet at the time of contract award. The MSDS shall be provided in accordance with the requirements of FED-STD-313. The MSDS shall be included with each shipment of the material covered by this specification (see 6.5).

3.2.4 Disposal requirement. Waste powder and removed coating shall be disposed of in ordinary landfill. If dusting is a landfill problem, disposal shall be in accordance with both the state and federally imposed Environmental Protection Agency (EPA) regulations.

3.3 Coating characteristics. The material shall be a finely ground powder of a one-component compounded material consisting of a resin, curing agents, catalysts, fillers, colorants, and flow control agents. When applied to a substrate and subjected to a heating cycle, as required by the contractor, the material shall melt, fuse, and subsequently cure to form a coating which meets or exceeds all the requirements of this specification. The contractor shall specify the application procedure, and health and safety information necessary to assure optimum performance.

3.3.1 Application conditions. The powder coating shall be cured when applied under the conditions recommended by the contractor.

3.4 Film properties. The powder coating shall be applied by established commercial powder coating methods over abrasive blasted steel and aluminum. Coating shall have a total dry film thickness for interior and exterior steel and aluminum surfaces of 5 to 7 mils and 8 to 12 mils, respectively. The coating shall be smooth, even, and free of runs, sags, and streaks.

3.5 Gel time. Gel time of a film of applied powdered materials shall be not less than 20 seconds nor more than 60 seconds.

3.6 Specific gravity. Specific gravity of powdered materials shall be 1.2 minimum (see 4.8.3).

3.7 Color. Color of the cured film of applied powder coatings shall be as specified (see 6.2) in accordance with FED-STD-595 color chip (see 4.8.4).

3.8 Flexibility. The cured film of applied powder coating shall show no cracking or loss of adhesion in the bend area (see 4.8.5).

3.9 Adhesion. The cured film of applied powder coating shall show no lifting, flaking, or other signs of loss of adhesion (see 4.8.6).

3.10 Specular gloss. Initially, the 60-degree specular gloss of the cured film of applied powder coating (for all colors except Navy haze-gray) shall have a minimum requirement of 40 and a maximum requirement of 60. The 60-degree specular gloss requirement for Navy haze-gray shall have a minimum requirement of 40 and a maximum requirement of 50 (see 4.8.7).

3.11 Dielectric strength. The cured film of applied powder coating shall have an average dielectric strength greater than 30 volts per micrometer (762 volt per mil) (see 4.8.8).

3.12 Thermal shock resistance (for type II only). The cured film of applied powder coating shall withstand 10 cycles between 74 ± 2 degrees Celsius (°C) (165 ± 4 degrees Fahrenheit (°F)) and minus 54 ± 2°C (minus 65 ± 4°F) without cracking, checking, or disbonding (see 4.8.9).

3.13 Impact resistance. The cured film of applied powder coating shall provide a coating that will have a minimum direct and reverse impact resistance of 18 newton meters (160 inch pounds) and 2.8 newton meters (25 inch pounds), respectively, without forming a holiday when inspected with a 67.5 volt detector (see 4.8.10).

3.14 Abrasion resistance. Weight loss from the cured film of applied powder coating shall not exceed 50 milligrams (mg) (0.0001 pound) (see 4.8.11).

3.15 Salt spray resistance (for type II only). A cured film of applied powder coating shall show undercutting of not more than 6 millimeters (mm) (1/4 inch) from the score lines. There shall also be no blistering, wrinkling, or loss of adhesion of the coating nor any general surface corrosion or pitting (see 4.8.12).

3.16 Fluid resistance properties (for type II only). The fluid resistance properties for type II shall be as follows:

(a) Water immersion. The cured film of applied powder coating shall show no wrinkling, blistering, or loss of adhesion (see 4.8.13.1).
(b) Hydrocarbon immersion. A cured film of applied powder coating shall show no softening, blistering, or rusting (see 4.8.13.2).
(c) Hydraulic fluid immersion. A cured film of applied powder coating shall show no softening, blistering, or rusting (see 4.8.13.3).

3.17 Chemical resistance. The cured film of applied powder coating shall not blister, soften, lose bond, discolor, change greater than 50 percent in gloss, nor develop holidays when tested in accordance with ASTM D 1308 and ASTM D 2248. The intentionally made holes shall exhibit no undercutting during the 45-day test period (see 4.8.14). Undercutting of the coating due to extreme corrosion of the test substrate shall not be considered failure of the coating.

3.18 Weathering properties (for type II only). The weathering properties for type II only shall be as follows:

(a) Accelerated weathering. The cured film of applied powder coating shall show no cracking, a loss of not more than 50 percent of the gloss measured before exposure, color change, blistering, wrinkling, or loss of adhesion of the coating nor evidence of substrate corrosion after 1,000 hours exposure to accelerated weathering (see 4.8.15.1).
(b) Humidity resistance. The cured film of applied powder coating shall show no corrosion, blistering, wrinkling, or loss of adhesion (see 4.8.15.2).

3.19 Hardness. The cured film of applied powder coating shall have a minimum scratch pencil hardness of 2H (see 4.8.16).

3.20 Holiday. The cured film of applied powder coating shall be free of holidays (see 4.8.17).

3.21 Shelf life. Powder coating materials shall meet the requirements of this specification for 1 year from the date of manufacture when stored unopened in the original container at below 27°C (80°F) and at a relative humidity less than 50 percent.

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 facilities 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 the 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) First article inspection (see 4.3).
(b) Quality conformance inspection (see 4.4).

4.2.1 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions specified in the applicable test methods specified herein.

4.3 First article inspection. First article inspection shall consist of the tests specified in 4.8.1 through 4.8.17.

4.4 Quality conformance inspection. For purposes of quality conformance inspection, a lot shall consist of all powdered material of the same formula designation from a single uniform batch manufactured and offered for delivery at one time. Two samples of each lot of powdered material shall be forwarded to a designated Government laboratory for quality conformance tests.

4.4.1 Quality conformance tests. Quality conformance tests on two samples of powdered material for individual lots shall consist of tests as specified in 4.8.1 through 4.8.6 (see 6.3).

4.5 Test procedures. Unless otherwise specified (see 6.2), tests shall be performed on duplicate panels of each material.

4.6 Test panels. The test panel material, the surface preparation and test panel coating application shall be as specified (see 4.6.1 through 4.6.3).

4.6.1 Material. Unless otherwise specified (see 6.2), test panels shall be prepared from both sheet steel conforming to ASTM A 366, cold rolled, and sheet aluminum conforming to ASTM B 209, alloy 5086, and may be of any convenient size and thickness subject to the following limitations. Unless otherwise specified (see 6.2), panels shall be at least 100 by 150 by 3 mm (4 by 6 by 0.125 inch). Panels for the flexibility test shall be 25 by 150 by 0.75 mm (1 by 6 by 0.03 inch).

4.6.2 Surface preparation. Unless otherwise specified herein, the panels shall be cleaned in solvent (xylene and isopropanol, one to one ratio by volume), rinsed in clean solvent, and dried. The entire panel shall be abrasive blasted using any suitable equipment and abrasive blasting material. The abrasive materials shall be free from oil, grease, dirt, water, or other contaminants that would impair the coatability of the panel surface. The panels shall be blasted clean to a near white metal, in accordance with SSPC SP 10. After blasting, the panels shall be cleaned by using clean, dry compressed air or a vacuum. (Note: Minimum panel thickness which can be blasted effectively without deformation is 16 gauge.) Anchor pattern for interior and exterior aluminum and steel surfaces shall be 0.025 to 0.0375 mm (1.0 to 1.5 mils) and 0.050 to 0.075 mm (2.0 to 3.0 mils), respectively.

4.6.3 Application methods. After proper surface preparation (see 4.6.2), the panels shall be kept free from fingerprints and rust. Application of the powder coating shall be accomplished within a maximum of 2 hours after cleaning, or the cleaned panels may be stored in clean toluene or a desiccator for not more than 72 hours before coating. Unless otherwise specified (see 6.2), the coating shall be applied in accordance with the contractor's instructions. A dry film thickness of 0.200 to 0.300 mm (8 to 12 mils) is required for exterior steel and aluminum test surfaces, and a dry film thickness of 0.125 to 0.175 mm (5 to 7 mils) is required for interior steel and aluminum test surfaces. Coatings for the flexibility test shall be 0.076 $\pm$ 0.013 mm (3 $\pm$ 0.5 mils) thick.

4.7 Test conditions. Unless otherwise specified (see 6.2), the testing conditions shall be in accordance with ASTM D 3924. The dry film thickness shall be measured after the coated panel has been postheated in accordance with contractor's instructions.

4.8 Tests. The coating test methods shall be as specified (see 4.8.1 through 4.8.17).

4.8.1 Coating. Panels shall be prepared, cleaned, and coated as specified in 4.6.2 and 4.6.3. The coated panels shall be examined for conformance to the requirements specified in 3.4.

4.8.2 Gel time. The gel time for powdered materials shall be determined by placing 0.5 gram of the powder on a clean, oil free, hot surface maintained at 200 ± 2°C (392 ± 4°F) and roughly stirring until the powder begins to solidify. A stopwatch shall be used to monitor the time elapsed between the time the powder is placed on the plate until it begins to solidify (gel). This elapsed time is defined as the gel time (see 3.5). A non-thermally conductive material such as wood shall be used to stir the powder. An average of five determinations shall be recorded as the gel time. The gel time shall be recorded to the nearest second. Temperature of the hot surface shall be determined with a contact thermocouple or other similar means.

4.8.3 Specific gravity. Specific gravity of 1.2 minimum of powdered materials shall be determined in accordance with method B specified in ASTM D 792 (see 3.6).

4.8.4 Color. Panels shall be prepared and coated as specified in 4.6. The color shall meet the requirements specified in 3.7. Color shall be a general color match as tested in accordance with ASTM D 1729.

4.8.5 Flexibility. Three panels prepared and coated as specified in 4.6 and cured as applicable shall be bent 180 degrees over a 12.5-mm (1/2-inch) mandrel in accordance with ASTM D 1737. The panels shall be visually examined immediately to determine conformance to the requirements specified in 3.8.

4.8.6 Adhesion. Panels shall be prepared and coated as specified in 4.6.2 and 4.6.3. Two parallel scratches shall be made through the coating to each substrate 25 mm (1 inch) apart, and not less than 50 mm (2 inches) long, using a stylus. A 25-mm (1-inch) wide strip of masking tape, in accordance with ASTM D 3652, shall be placed perpendicular to the scratches, adhesive side down. The tape shall be pressed down using two passes of a rubber-covered roller weighing 5 pounds. The tape shall be removed immediately in one abrupt motion, exerting the pull at approximately 90 degrees to each panel. The coating shall be examined for conformance to the requirements specified in 3.9.

4.8.7 Specular gloss. Panels shall be prepared and coated as specified in 4.6. The 60-degree specular gloss of the powder coating shall be determined in accordance with ASTM D 523 for conformance to the requirements specified in 3.10.

4.8.8 Dielectric strength. Five panels shall be prepared and coated as specified in 4.6. The dielectric strength of the powder coating material shall be in accordance with ASTM D 149. The dielectric strength shall be determined for panels in oil. Oil shall be used as a dielectric to prevent flashover and shall have no effect on the properties of the coating. The average dielectric strength of five panels shall conform to the requirements specified in 3.11.

4.8.9 Thermal shock (for type II only). Panels shall be prepared and coated as specified in 4.6. Test panels shall be placed in an oven maintained at 74 ± 2°C (165 ± 4°F) for 30 ± 0.5 minutes, then removed and quenched in cold tap water. The samples shall then be wiped dry and immediately plunged into a suitable low temperature environment held at minus 54 ± 2°C (minus 65 ± 4°F) for 10 ± 0.5 minutes. After each cycle, the panels shall be inspected for conformance to 3.12. Cycling shall be continued until the panel fails or until 10 cycles have passed.

4.8.10 Impact resistance. Panels 150 by 300 by 3 mm (6 by 12 by 0.125 inch) shall be prepared and coated as specified in 4.6. Test panels shall be impact tested in accordance with ASTM D 2794 using a 1.8-kilogram (4-pound) weight. The impact tup shall terminate in a hemispherical, 15.875-mm (5/8-inch) diameter nose. Backing plates shall not be used. The impact resistance shall be determined for conformance to the requirements specified in 3.13.

4.8.11 Abrasion resistance. Steel panels, 100 by 100 by 3 mm (4 by 4 by 0.125 inch) shall be prepared and coated as specified in 4.6. The panels shall be tested using a Taber Abraser apparatus using CS-17 wheels, 1000-gram (2.2-pound) weights for 1000 cycles, in accordance with ASTM D 4060. Weight loss shall be used as the evaluation criteria rather than optical clarity. The weight loss shall be determined immediately to three decimal places for conformance to the requirements specified in 3.14.

4.8.12 Salt spray resistance (for type II only). Panels shall be prepared, cleaned, and coated as specified in 4.6. Test panels shall be exposed in accordance with ASTM B 117. Exposure time shall be 3000 hours minimum for steel substrates and 1500 hours minimum for aluminum substrates. The panels shall be examined for conformance to the requirements specified in 3.15.

4.8.13 Fluid resistance properties (for type II only). The fluid resistance properties for type II only shall be as specified (see 4.8.13.1 through 4.8.13.3).

4.8.13.1 Boiling water immersion test. Panels shall be prepared and coated as specified in 4.6 and conditioned for 24 hours in accordance with 4.7. Half of each panel shall then be immersed in boiling, distilled water for 24 hours. After removal from the water, each panel shall then be examined immediately for wrinkling, blistering, adhesion, and to verify conformance to 3.16(a).

4.8.13.2 Hydrocarbon immersion. Panels, 150 by 300 by 3 mm (6 by 12 by 0.125 inch), shall be prepared and coated as specified in 4.6. Half of each panel shall be immersed in toluene in accordance with TT-T-548 as specified in 4.7. The panels shall be examined after 3, 10, and 30 days for conformance to 3.16(b).

4.8.13.3 Hydraulic fluid immersion test. Panels, 150 by 300 by 3 mm (6 by 12 by 0.125 inch), shall be prepared and coated as specified in 4.6. Half of the coated panels shall be immersed in hydraulic fluid in accordance with MIL-H-5606 as specified in 4.7. The panels shall be examined after 3, 10, and 30 days for conformance to 3.16(c).

4.8.14 Chemical resistance. Panels, 150 by 300 by 3 mm (6 by 12 by 0.125 inch), shall be prepared and coated for each chemical solution as specified in 4.6. Half of the coated panels shall be immersed in each of the following: distilled water, a 3M aqueous solution of Ca(Cl)2, a 3M aqueous solution of NaOH, and a solution saturated with Ca(OH)2 and tested in accordance with ASTM D 1308 and ASTM D 2248. Specimens without holidays and specimens with intentional holes drilled through the coating 6.25 mm (1/4 inch) in diameter shall be tested. Minimum test time shall be 45 days. The panels shall be examined after 3, 10, 30, and 45 days for conformance to 3.17.

4.8.15 Weathering properties (for type II only). Weathering properties for type II only shall be as specified in 4.8.15.1 and 4.8.15.2.

4.8.15.1 Accelerated weathering. Panels shall be prepared and coated as specified in 4.6.2 and 4.6.3. Panels shall be conditioned for 24 hours in accordance with 4.7, then subjected to accelerated weathering for 1,000 hours in accordance with ASTM G 26, method 1, type BH. Panels shall be removed and examined for conformance to the requirements specified in 3.18(a).

4.8.15.2 Humidity resistance. Panels shall be prepared and coated as specified in 4.6.2 and 4.6.3. Then they shall be conditioned for 24 hours in accordance with 4.7. The panels shall be exposed in a humidity cabinet in accordance with ASTM D 2247 and operated at 49 $\pm$ 1°C (120 $\pm$ 2°F) and 100 percent humidity. The powder coating shall be exposed for 30 days. After exposure, the panels shall be examined for conformance to 3.18(b).

4.8.16 Hardness. Panels shall be prepared and coated as specified in 4.6. The scratch hardness of the powder coating shall be determined in accordance with ASTM D 3363 for conformance to 3.19. The average of five determinations shall be recorded as the hardness.

4.8.17 Holiday test. Panels shall be prepared and coated as specified in 4.6. Holiday detection shall be performed with a 67.5 voltage direct current detector on the whole panel. Examine panels for conformance with 3.20.

4.9 Toxicity. To determine conformance to requirements of this specification, the manufacturer of the material shall disclose the formulation of his product to the Naval Medical Command, MEDCOM-242, Washington, DC 20372. The disclosure of proprietary information, which shall be held in confidence by the Naval Medical Command, shall include: the name, formula, and approximate percentage by weight and volume of each ingredient in the product; the results of any toxicological testing of the product; identification of its pyrolysis products; and any such other information as may be needed to permit an accurate appraisal of any toxicity problem associated with the handling, storage, application, use, disposal, or combustion of the material. Information submitted shall be clearly marked or identified to show it is being provided in connection with MIL-C-24712.

4.10 Inspection of packaging. Sample packages and packs, and the inspection of the preservation, packing and marking for shipment, stowage and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition.)

5.1 General.

5.1.1 Navy fire-retardant requirements.

(a) Lumber and plywood. When specified (see 6.2), all lumber and plywood including laminated veneer material used in shipping container and pallet construction members, blocking, bracing, and reinforcing shall be fire-retardant treated material conforming to MIL-L-19140 as follows:

Levels A and B - Type II - weather resistant.
Category 1 - general use.

Level C - Type I - non-weather resistant.
Category 1 - general use.

(b) Fiberboard. Unless otherwise specified (see 6.2), fiberboard used in the construction of class-domestic, non-weather resistant fiberboard, and cleated fiberboard boxes including interior packing forms shall meet the flamespread and the specific optic density requirements of PPP-F-320 and amendments thereto.

5.1.2 Unit pack quantity. Unless otherwise specified (see 6.2), the powdered coating shall be furnished in 50- to 55-pound unit packs as specified for the required level of preservation (see 5.2).

5.2 Preservation. Preservation shall be level A, C, or commercial as specified (see 6.2).

5.2.1 Level A. Unit packs shall consist of a plastic bag with a fiberboard box overpack as follows:

(a) Plastic bag. The plastic bag shall be constructed of material conforming to L-P-378, type I, class 1, with grade and finish at the contractor's option. Final bag closure shall be accomplished by twisting and securing with a self-lock type plastic tie.
(b) Fiberboard box. The fiberboard box shall conform to PPP-B-636, class weather-resistant with variety, grade, and style at the contractor's option. Box closure shall be in accordance with method V and reinforced with tape or nonmetallic stripping in accordance with the appendix to the box specification.

5.2.2 Level C. The unit pack shall be as specified for level A except that the fiberboard box shall conform to class domestic/fire-retardant (see 5.1.1) with variety, grade, and style at the contractor's option. Box closure shall be in accordance with method I using pressure-sensitive adhesive tape.

5.2.3 Commercial. Commercial preservation shall be in accordance with ASTM D 3951.

5.3 Packing. Packing shall be level A, B, C, or commercial as specified (see 6.2).

5.3.1 Level A. Coating preserved as specified (see 5.2) shall be packed in exterior shipping containers in accordance with table VII of MIL-STD-2073-1, appendix C and herein. Unless otherwise specified (see 6.2), container selection shall be at the contractor's option.

5.3.1.1 Caseliners and gross weight.

5.3.1.1.1 Caseliners. Unless otherwise specified (see 6.2), level A shipping containers containing coating preserved level C or commercial shall be provided with waterproof caseliners in accordance with MIL-STD-2073-1.

5.3.1.1.2 Weight. Wood, plywood, and cleated type containers exceeding 200 pounds gross weight shall be modified by the addition of skids in accordance with MIL-STD-2073-1 and the applicable container specification or appendix thereto.

5.3.2 Commercial. Coating preserved as specified (see 5.2) shall be packed for shipment in accordance with ASTM D 3951.

5.4 Marking. In addition to any special marking required (see 6.2) and herein, interior (unit packs) shipping containers and palletized unit loads shall be marked including bar coding for shipment, stowage, and storage in accordance with MIL-STD-2073-1, appendix F.

5.4.1 Precautionary marking. Each unit pack (plastic bag and box), shipping container, and palletized unit load shall be marked with the following (see 3.21):

"DO NOT STORE AT TEMPERATURES ABOVE 27°C
(80°F) AND RELATIVE HUMIDITY ABOVE 50%"

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 specification covers a high grade, durable coating of an epoxy resin type consisting of the required components intended for coating and protecting from corrosive deterioration to interior aluminum and steel equipment, furniture, electric box surfaces, and corrosive deterioration to exterior steel and aluminum items that receive severe exposure to adverse weather, condensing moisture, corrosive atmospheres, and marine environments.

6.1.1 Coating applications. Coating application and touch-up should be as specified (see 6.1.1.1 and 6.1.1.2).

6.1.1.1 New applications. Powder coatings in accordance with this specification should be applied as specified in the manufacturer's instructions or technical data sheet.

6.1.1.2 Touch-up applications. Coatings should be maintained by using a compatible two component liquid epoxy patch compound.

6.2 Acquisition requirements. Acquisition documents must specify the following:

(a) Title, number, and date of this specification.
(b) Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
(c) Type as specified (see 1.2).
(d) When first article is required (see 3.1).
(e) FED-STD-595 color chip number (see 3.7).
(f) When duplicate test is not required (see 4.5).
(g) Dimensions and material of test panels, if other than specified (see 4.6.1).
(h) Coating procedure, if other than contractor's instructions (see 4.6.3).
(i) Routine and referee testing conditions if required (see 4.7).
(j) Required Navy fire retardant requirements (see 5.1.1).
(k) Unit pack quantity, if other than specified (see 5.1.2).
(l) Level of preservation and packing required (see 5.2 and 5.3).
(m) Container selection, if other than contractor's option (see 5.3.1).
(n) Caseliners, if not required (see 5.3.1.1.1).
(o) Special marking required (see 5.4).

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DIDs) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/ provided and that the DIDs are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DoD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

Reference paragraph	DID number	DID title	Suggested tailoring
3.2, appendix	DI-MISC-80653	Test reports	-----
4.4.1	DI-MISC-80678	Certification/data report	-----

The above DIDs 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 1423.

6.4 First article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a preproduction sample, a first article sample, a first production item, a sample selected from the first _____ production items, a standard production item from the contractor's current inventory (see 3.1), and the number of items to be tested as specified in 4.3. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.5 Material safety data sheet (MSDS). Contracting officers must identify those activities requiring copies of MSDS's. Additional required Government information is contained in FED-STD-313. In order to obtain the MSDS, FAR clause 52.223-3 must be in the contract.

6.6 Subject term (key word) listing.

Adhesion
Application instruction
Color
Dielectric strength
Flexibility
Gel time
Marine environment
Material safety data sheets
Specific gravity
Toxicity
Waste powder

Custodians:
Army - ME
Navy - SH
AF - 99

Review activities:
Army - MR
Navy - AS
AF - 84

User activities:
Navy - MC, CG

Preparing activity:
Navy - SH
(Project 8010-1187)

APPENDIX

TECHNICAL REPORT TECHNICAL CONTENT REQUIREMENTS

10. SCOPE

10.1 Scope. This appendix covers technical content requirements that should be included in the technical reports when required by the contract or order. This appendix is mandatory only when data item description DI-MISC-80653 is cited on the DD Form 1423.

20. APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

30. TECHNICAL REPORT

30.1 Content and format. The report shall be on metric size A4 (8-1/2 x 11 inch) paper in contractor format and contain the following information:

(a) Color
(b) Specific gravity
(c) Shelf life
(d) Gel time
(e) Gloss
(f) Adhesion
(g) Flexibility
(h) Application and safety instructions
(i) Commercial name or coded designation

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-C-24712	COATINGS, POWDERED EPOXY (METRIC)

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
	☐ USER
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ MANUFACTURER
	☐ OTHER *(Specify)*:

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)

DD FORM 82 MAR 1426 PREVIOUS EDITION IS OBSOLETE.