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METRIC
MIL-PRF-32584
1 August 2017
SUPERSEDING
(See 6.4)

PERFORMANCE SPECIFICATION

DECK COVERING MATERIALS, MONOLITHIC

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

1. SCOPE

1.1 Scope. This specification covers monolithic deck covering materials for interior shipboard applications.

1.2 Classification. Monolithic deck covering materials are of the following types, classes, grades, and compositions as specified (see 6.2).

1.2.1 Types.

a. Type I – Coating, high durability, general

b. Type II – Coating, high durability, corrosion resistant

c. Type III – Coating, Aqueous Film Forming Foam (AFFF) resistant

d. Type IV – Chemical-resistant floorings (resin-based seamless flooring, e.g., cosmetic polymeric, terrazzo, and color flake), underlayment required

e. Type V – Chemical-resistant floorings (resin-based seamless flooring, e.g., cosmetic polymeric, terrazzo, and color flake), no underlayment required

f. Type VI – Latex concrete

1.2.2 Classes.

a. Class 1 – For general shipboard use

b. Class 2 – For use on submarines

1.2.3 Grades.

a. Grade A – All system components of the qualifying system have a Volatile Organic Compound (VOC) not greater than 250 grams per liter (g/L) (2.08 pounds per gallon [lb/gal]).

b. Grade B – All system components of the qualifying system have a VOC not greater than 340 g/L (2.84 lb/gal).

1.2.4 Compositions.

a. Composition E – Epoxy

b. Composition P – Polyurethane or polyurea

c. Composition O – Other

Comments, suggestions, or questions on this document should be addressed to Commander, Naval Sea Systems Command, ATTN: SEA 05S, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard DC 20376-5160 or emailed to CommandStandards@navy.mil, with the subject line "Document Comment". Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil.

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2. APPLICABLE DOCUMENTS

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

2.2 Government documents.

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

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-3135	-	Deck Covering Underlay Materials
MIL-DTL-5624	-	Turbine Fuel, Aviation, Grades JP-4 and JP-5
MIL-F-24385	-	Fire Extinguishing Agent, Aqueous Film-Forming Foam (AFFF) Liquid Concentrate, for Fresh and Sea Water
MIL-DTL-24441	-	Paint, Epoxy-Polyamide, General Specification for

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-1623	-	Fire Performance Requirements and Approved Specifications for Interior Finish Materials and Furnishings (Naval Shipboard Use)

(Copies of these documents are available online at http://quicksearch.dla.mil.)

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

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 60, Appendix A-7, Method 24	-	Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings
40 CFR 63, Subpart II	-	National Emission Standards for Shipbuilding and Ship Repair (Surface Coating)
40 CFR 63, Appendix A, Method 311	-	Analysis of Hazardous Air Pollutant Compounds in Paints and Coatings by Direct Injection Into a Gas Chromatograph
40 CFR 261.24	-	Toxicity Characteristic

(Copies of these documents are available online at http://www.ecfr.gov.)

NAVAL SEA SYSTEMS COMMAND (NAVSEA) PUBLICATIONS

S9510-AB-ATM-010	-	Nuclear Powered Submarine Atmosphere Control Manual

(Copies of the chapter titled "Material Control Program" are available by email request to CommandStandards@navy.mil.)

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T9070-AL-DPC-020/077-2 - NAVSEA Hazardous Material Avoidance Process

(Copies of this document are available online via Technical Data Management Information System (TDMIS) at https://mercury.tdmis.navy.mil/ by searching for the TMIN without the suffix. Refer questions, inquiries, or problems to: DSN 296-0669, Commercial (805) 228-0669. This document is available for ordering (hard copy) via the Naval Logistics Library https://nll.navsup.navy.mil. For questions regarding the NLL, contact the NLL Customer Service at nllhelpdesk@navy.mil, (866) 817-3130, or (215) 697-2626/DSN 442-2626.)

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

ASTM INTERNATIONAL

ASTM A568/A568M	-	Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for
ASTM B117	-	Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM C413	-	Standard Test Method for Absorption of Chemical-Resistance Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes
ASTM C482	-	Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste
ASTM C722	-	Standard Specification for Chemical-Resistant Monolithic Floor Surfacings
ASTM C1028	-	Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method
ASTM C1438	-	Standard Specification for Latex and Powder Polymer Modifiers for use in Hydraulic Cement Concrete and Mortar
ASTM C1439	-	Standard Test Methods for Evaluating Latex and Powder Polymer Modifiers for use in Hydraulic Cement Concrete and Mortar
ASTM D257	-	Standard Test Methods for DC Resistance or Conductance of Insulating Materials
ASTM D523	-	Standard Test Method for Specular Gloss
ASTM D610	-	Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces
ASTM D823	-	Standard Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels
ASTM D1141	-	Standard Practice for the Preparation of Substitute Ocean Water
ASTM D1193	-	Standard Specification for Reagent Water
ASTM D1308	-	Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes
ASTM D1475	-	Standard Test Method for Density of Liquid Coatings, Inks, and Related Products

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ASTM D1640/D1640M	-	Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings
ASTM D1849	-	Standard Test Method for Package Stability of Paint
ASTM D2047	-	Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine
ASTM D2794	-	Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D3278	-	Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus
ASTM D3363	-	Standard Test Method for Film Hardness by Pencil Test
ASTM D4060	-	Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
ASTM D6450	-	Standard Test Method for Flash Point by Continuously Closed Cup (CCCFP) Tester
ASTM E1252	-	Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis
ASTM F718	-	Standard Specification for Shipbuilders and Marine Paints and Coatings Product/Procedure Data Sheet
ASTM F1914	-	Standard Test Methods for Short-Term Indentation and Residual Indentation of Resilient Floor Covering
ASTM F2217/F2217M	-	Standard Practice for Coating/Adhesive Weight Determination

(Copies of these documents are available online at www.astm.org.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO/IEC 17025 - General Requirements for the Competence of Testing and Calibration Laboratories

(Copies of this document are available online at www.iso.org.)

SAE INTERNATIONAL

SAE-AMS-STD-595 - Colors Used in Government Procurement

SAE J300 - Engine Oil Viscosity Classification

(Copies of these documents are available online at www.sae.org.)

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC-SP 10/NACE NO. 2 - Near-White Blast Cleaning

(Copies of this document are available online at www.sspc.org.)

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

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3. REQUIREMENTS

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

3.2 Material. Deck covering materials supplied under this specification shall comply with all Navy occupational health and safety regulations and meet the following characteristics.

3.2.1 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.2.2 Fire performance. When tested in accordance with 4.6, the deck covering system shall conform to the requirements in MIL-STD-1623.

3.2.3 Off-gassing (class 2 only). The Class 2 deck covering system materials shall be evaluated for off-gassing in accordance with the requirements of 4.7. Based on the circumstances of use and the chemical nature of the class 2 deck covering system materials, the Navy will determine whether off-gas testing is required or if an administrative assessment is acceptable. In order to be considered acceptable for use in submarines, the class 2 deck covering system materials shall be assigned to either the "Permitted" or "Limited" category (see 4.7 and 6.7).

3.2.4 Toxicity and prohibited materials.

3.2.4.1 Toxicity. When evaluated in accordance with 4.8, the deck covering system shall pose no serious or high risk to the health of personnel or the environment when used for its intended purpose (see 4.8 and 6.8).

3.2.4.2 Prohibited materials. The deck covering system shall not contain any chemicals categorized as "prohibited" in accordance with T9070-AL-DPC-020/077-2.

3.2.5 Metals content. When tested as specified in 4.9, the content of each soluble metal and the total content in each system component of the deck covering system shall not exceed the values listed in table I. Total metal content may be submitted in place of soluble metal content so long as value is lower than what is listed in the soluble metal column.

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TABLE I. Metals content.

Metal and its compound in each deck covering dry film	Soluble metal, maximum (mg/L)	Total metal content, maximum (wt%)
Antimony	15	0.015
Arsenic	5	0.005
Barium (excluding barite)	100	0.10
Beryllium	0.75	0.0002
Cadmium	1	0.0005
Chromium (VI)	1	0.001
Chromium or chromium (III)	560	0.56
Cobalt	50	0.005
Copper	25	0.01
Fluoride salts	180	0.18
Lead	5	0.005
Mercury	0.2	0.0002
Molybdenum	350	0.35
Nickel	20	0.02
Selenium	1	0.002
Silver	5	0.001
Tantalum	100	0.100
Thallium	7	0.007
Tungsten	100	0.100
Vanadium	24	0.01
Zinc	250	0.25

3.2.6 Volatile organic compound (VOC) content.

3.2.6.1 Grade A. When tested as specified in 4.10, the VOC content of each system component of the deck covering system shall not exceed 250 g/L (2.08 lb/gal).

3.2.6.2 Grade B. When tested as specified in 4.10, the VOC content of each system component of the deck covering system shall not exceed 340 g/L (2.84 lb/gal).

3.2.7 Hazardous air pollutant (HAP) content. When evaluated as specified in 4.11, the total HAP content, as defined by the 40 CFR 63, Subpart II (Environmental Protection Agency [EPA] National Emission Standards for Hazardous Air Pollution [NESHAP]) requirements for shipbuilding and ship repair, of each system component, shall not exceed the VOC limit prescribed for the specific grades (see 3.2.6).

3.3 Flash point (types I – V). When tested as specified in 4.12, each coating part shall not flash at a temperature lower than 38 °C (100 °F).

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3.4 Identification characteristics. Values and test methods for identification characteristics shall be provided as specified below (see 6.2). The values shall be established for the complete deck covering system prior to qualification inspection and shall be tested as specified in 4.5. The purpose of these values is to serve as a basis for determining that the material being offered is the same as that which was approved under qualification inspection.

a. Color (types I, II and III, SAE-AMS-STD-595) and pattern

b. Unit of issue

c. Maximum application thickness (mm) (in)

d. Coating weight at maximum application thickness (g/m^2)(lb/ft^2)(ASTM F2217/F2217M)

e. Density for liquid coatings (g/L) (lb/gal) (ASTM D1475)

f. System components (e.g., base/color coat, color chips, aggregate, sealer coat)

g. Chemical nature of each system component (e.g., epoxy, polyurethane, latex, etc.)

h. Application method (types IV and V only, ASTM C722)

i. Mix ratios of each system component

j. Aggregate or broadcast composition

k. Shelf life

l. Volume solids (excluding type VI)

3.5 Manufacturer's instructions for use (ASTM F718). As specified (see 6.2), ASTM F718 shall be provided for each system component.

3.6 Requirements for types I, II, and III.

3.6.1 Shelf life. When tested as specified in 4.14.1, the coating shall exhibit a level 10 for all qualities in accordance with ASTM D1849.

3.6.2 Gloss. When tested as specified in 4.14.2, gloss of the coating shall be greater than 45 percent.

3.6.3 Abrasion resistance. When tested as specified in 4.14.3, the average weight loss shall not exceed 0.16 grams (0.0056 ounces).

3.6.4 Impact resistance. When tested as specified in 4.14.4, the force required to cause coating failure at the point of impact shall be not less than 3.16 Newton-meters (28 inch-pounds).

3.6.5 Slip resistance. When tested as specified in 4.14.5, the static coefficient of friction (SCOF) shall be not less than 0.70 for dry surfaces and 0.60 for wet surfaces.

3.6.6 Chemical resistance. When tested as specified in 4.14.6, the exposed coating system shall be visually indistinguishable from the panel before exposure.

3.6.6.1 AFFF resistance (type III only). When tested as specified in 4.14.6.1, the coating shall be visually indistinguishable from the panel before immersion and shall not decrease more than one unit of hardness.

3.6.7 Salt spray (fog) resistance (type II only). When tested as specified in 4.14.7, the coating on all test panels shall exhibit a rust grade of 10 in accordance with ASTM D610 with no evidence of blistering.

3.7 Requirements for types IV and V.

3.7.1 Chemical-resistant monolithic floorings. When tested as specified in 4.15.1, the deck covering shall meet all the requirements of ASTM C722 as specified by application method classification, except as specified in 3.7.1.1.

3.7.1.1 Slip resistance. When tested as specified in 4.15.1, the deck covering SCOF shall be not less than 0.70 for dry surfaces and 0.60 for wet surfaces.

3.7.2 Chemical resistance. When tested as specified in 4.15.2, the exposed deck covering system shall be visually indistinguishable, and shall retain at least 90 percent of the gloss of the panel before exposure.

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3.7.3 Corrosion resistance. When tested as specified in 4.15.3, the deck covering shall not become detached, and the surface of the steel beneath the deck covering material shall show no signs of corrosion, capillary action (wicking), or other water penetration.

3.7.4 Impact resistance. When tested as specified in 4.15.4, the deck covering shall show no visible signs of chipping, cracking, or detachment from the test panel. The permanent indentation of the deck covering shall not exceed 1.59 millimeters (1/16 inches).

3.7.5 Indentation resistance.

3.7.5.1 Initial indentation. When tested as specified in 4.15.5, the initial indentation shall not exceed 5 percent of the deck covering thickness.

3.7.5.2 Residual indentation. When tested as specified in 4.15.5, the residual indentation shall not exceed 1 percent of the deck covering thickness.

3.7.6 Vertical sag (type V only). When tested as specified in 4.15.6, the decking material at the bottom of the panel shall not exceed 150 percent of the thickness of the material at the top of the panel.

3.7.7 Abrasion resistance. When tested as specified in 4.15.7, the average weight loss shall not exceed 0.16 grams (0.0056 ounces).

3.8 Requirements for type VI.

3.8.1 Indentation resistance. When tested as specified in 4.16.1, the initial indentation shall not exceed 1.5 percent of the deck covering thickness and shall show no signs of cracking or becoming detached from the test panel as a result of the indentation.

3.8.2 Impact resistance. When tested as specified in 4.16.2, the deck covering shall show no visible signs of chipping, cracking, or detachment from the test panel.

3.8.3 Moisture absorption. When tested as specified in 4.16.3, the deck covering shall not gain more than 2 percent of the specimen's original weight.

3.8.4 Bond strength. When tested as specified in 4.16.4, the average bond strength shall be not less than 14.6 kilograms per square centimeter (200 pounds per square inch).

3.8.5 Latex cement concrete. When tested in accordance with 4.16.5, the deck covering shall meet the requirements of ASTM C1438, type II concrete.

3.8.6 Slip resistance. When tested in accordance with 4.16.6, the SCOF shall be not less than 0.70 for dry surfaces and 0.60 for wet surfaces.

3.8.7 Sparking resistance. When tested as specified in 4.16.7, the deck covering shall show no evidence of sparking.

3.8.8 Electrical resistance. When tested as specified in 4.16.8, the average surface resistivity shall not exceed 3 megohms.

3.8.9 Abrasion resistance. When tested as specified in 4.16.9, the material loss shall not exceed 0.16 grams (0.0056 ounces).

4. VERIFICATION

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

a. Qualification inspection (see 4.2).

b. Conformance inspection (see 4.3).

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4.2 Qualification inspection. Qualification inspection shall consist of all tests specified in table II.

4.2.1 Changes to product. A change in material, production processes, or production equipment used in the manufacture of monolithic deck covering materials, which have been qualified, shall require written approval by NAVSEA. Incorporation of any changes, which have not been so approved, shall require requalification of item in question.

4.3 Conformance inspection. When specified (see 6.2), conformance inspection shall consist of the conformance tests specified in table II. At a minimum, conformance inspections shall be performed on the first lot and every 19,000 L (5,000 gal) thereafter.

4.3.1 Lot. A lot shall consist of an individual system component of the same type, class, grade, and composition from a single uniform batch or a uniform blend of batches offered for delivery at one time.

4.4 Inspection conditions. Unless otherwise specified herein, all physical tests on deck covering system materials shall be made at 16 to 27 °C (60 to 80 °F) and 50±10 percent relative humidity.

TABLE II. Test procedures.

Deck covering type	Characteristic	Requirement paragraph	Test paragraph	Applicable test standard	Conformance test
All	Fire performance	3.2.2	4.6	MIL-STD-1623	---
	Off-gassing (class 2 only)	3.2.3	4.7	---	---
	Toxicity	3.2.4.1	4.8	---	---
	Metals content	3.2.5	4.9	---	---
	VOC content	3.2.6	4.10	---	X
	HAP content	3.2.7	4.11	---	---
	Flash point (liquid parts only) (excluding type VI)	3.3	4.12	ASTM D3278/ ASTM D6450	X
	Identification characteristics	3.4	4.5	---	---
	Color and pattern	3.4a	4.5	SAE-AMS-STD-595	X
	Density for liquid coatings	3.4d	4.5	ASTM D1475	X
	Volume solids (excluding type VI)	3.4l	4.5	---	X

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TABLE II. Test procedures – Continued.

Deck covering type	Characteristic	Requirement paragraph	Test paragraph	Applicable test standard	Conformance test
Types I, II, and III	Shelf life	3.6.1	4.14.1	ASTM D1849	---
	Gloss	3.6.2	4.14.2	ASTM D523	X
	Abrasion resistance	3.6.3	4.14.3	ASTM D4060	---
	Impact resistance	3.6.4	4.14.4	ASTM D2794	X
	Slip resistance	3.6.5	4.14.5	ASTM D2047/ ASTM C1028	X
	Chemical resistance	3.6.6	4.14.6	ASTM D1308	---
	Salt spray (fog) resistance (type II only)	3.6.7	4.14.7	ASTM B117/ ASTM D610	---
Types IV and V	Chemical-resistant monolithic floor surfacing	3.7.1	4.15.1	ASTM C722	---
	Slip resistance	3.7.1.1	4.15.1	ASTM C722/ ASTM D2047/ ASTM C1028	X
	Chemical resistance	3.7.2	4.15.2	ASTM C722/ ASTM D523	---
	Corrosion resistance	3.7.3	4.15.3	ASTM C722	---
	Impact resistance	3.7.4	4.15.4	ASTM D2794	X
	Indentation resistance	3.7.5	4.15.5	ASTM F1914	---
	Vertical sag (type V only)	3.7.6	4.15.6	---	---
	Abrasion resistance	3.7.7	4.15.7	ASTM D4060	---
Type VI	Indentation resistance	3.8.1	4.16.1	ASTM F1914	---
	Impact resistance	3.8.2	4.16.2	ASTM D2794	X
	Moisture absorption	3.8.3	4.16.3	ASTM C413	---
	Bond strength	3.8.4	4.16.4	ASTM C482	---
	Latex cement concrete	3.8.5	4.16.5	ASTM C1438/ ASTM C1439	---
	Slip resistance	3.8.6	4.16.6	ASTM D2047/ ASTM C1028	X
	Sparking resistance	3.8.7	4.16.7	---	---
	Electrical resistance	3.8.8	4.16.8	ASTM D257	---
	Abrasion resistance	3.8.9	4.16.9	ASTM D4060	---

4.5 General inspection. The deck covering system shall be visually inspected and identification characteristics shall be reviewed to ensure conformance to the requirements as specified in 3.4.

4.6 Fire performance. The as-applied deck covering system shall be tested in accordance with MIL-STD-1623 on 0.64-centimeter (¼-inch) thick steel or aluminum panels. Results of fire performance testing shall conform to the requirements of 3.2.2.

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4.6.1 Fire testing provisions. All fire tests specified in this document shall be conducted by an independent testing laboratory that is accredited to ISO/IEC 17025 and is approved by the NAVSEA. Accreditation shall be obtained from a recognized accreditation body such as American Association for Laboratory Accreditation (A2LA) or International Code Council's International Accreditation Services (IAS). The scope of accreditation shall include specific flammability and fire tests required for qualification. All other fire test provisions shall be as specified (see 6.2 and 6.6).

4.7 Off-gassing (class 2 only). The class 2 deck covering system materials shall be evaluated for off-gassing in accordance with S9510-AB-ATM-010 chapter titled "Material Control Program" (see 3.2.3 and 6.7). If the Navy determines that off-gas testing is required, testing shall be conducted at a NAVSEA approved test facility (see 3.2.3). The Navy will review the off-gas test results and assign a usage category. Additionally, the Navy will assign a usage category if an administrative review is conducted in lieu of off-gas testing (see 3.2.3).

4.8 Toxicity and prohibited materials. A Health Hazard Assessment (HHA) will be conducted to ensure conformance to 3.2.4.1 and 3.2.4.2, as required by the qualifying activity. The Navy and Marine Corps Public Health Center (NMCPHC) will evaluate the deck covering system using data provided by the manufacturer/distributor to the NMCPHC (see 3.2.4.1 and 6.8).

4.9 Metals content. Soluble and total metal content, except tantalum and tungsten, shall be determined on pulverized cured film of the deck covering system in accordance with 40 CFR 261.24(a), Toxicity Characteristic Leaching Procedure (TCLP). The test results for each metal shall be as specified in 3.2.5. Tantalum and tungsten soluble metal content and total metal content shall be analyzed as specified in 4.9.1. Calculation of individual hazardous metal contents can be based on either the manufacturer's testing of batches, or the supplier's data for raw materials used in the product. When specified (see 6.2), a formulation value shall be provided that will not be exceeded when the deck covering is tested in accordance with this paragraph.

4.9.1 Tantalum and tungsten content. The tantalum and tungsten content of the cured deck covering shall be determined using any appropriate spectroscopy test method. The tests shall be conducted in accordance with the instrument manufacturer's directions. Data supporting the test method choice and analytical accuracy shall be established. The test results for tantalum or tungsten shall be in conformance with the requirements of 3.2.5.

4.10 Volatile organic compound (VOC) content. The VOC content of each system component shall be measured in accordance with 40 CFR 60, Appendix A-7, Method 24. Results shall conform to the requirements of 3.2.6.

4.11 Hazardous air pollutant (HAP) content. The HAP content of each system component shall be measured in accordance with 40 CFR 63, Appendix A, Method 311 (EPA Test Method 311). Solvent fractions shall be identified in accordance with ASTM E1252 with the results recorded as percent weight of the total covering. Alternate methods of analysis shall be approved by NAVSEA. When specified (see 6.2), formulation data may be used by manufacturers in lieu of testing to demonstrate compliance with 3.6.2. The formulation data shall have a consistent and quantitatively known relationship to the testing required. Calculation of individual HAP contents can be based on either manufacturer evaluation of batches or supplier data for raw materials used in the product. Results shall conform to the requirements of 3.6.2.

4.12 Flash point. All deck covering materials shall be tested in accordance with ASTM D3278, Method A, or ASTM D6450. Results shall conform to the requirements of 3.3.

4.13 Test panel preparation.

4.13.1 Method 1 (types I, II, and III). The test panel shall be ground glass or Leneta© sag and leveling test chart (item #7B), or equivalent. The top coat of the coating system, color or sealer coat, shall be conditioned and mixed in accordance with ASTM F718. A film of mixed coating shall be drawn in accordance with ASTM D823, Practice E, to produce a wet film thickness of 75±25 micrometers (3±1 mils).

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4.13.2 Method 2 (types I, II, and III). Mild steel panels conforming to ASTM A568/A568M, cold rolled, approximately 10.2 centimeters by 10.2 centimeters by 0.32 centimeter (4 inches by 4 inches by ⅛ inch) with a 0.64-centimeter (¼-inch) hole in the center shall be prepared in accordance with SSPC-SP 10/NACE NO. 2 surface preparation or better. The deck coating shall be conditioned and mixed in accordance with ASTM F718. Two coats of the color coat shall be applied to all exposed surfaces in accordance with ASTM F718 to produce a total dry film thickness (DFT) of 508±102 micrometers (20±4 mils). The final coat shall be cured at 23±2.5 °C (73±5 °F) for 7 days, or until full cure-to-service time in accordance with ASTM F718 is reached, whichever is shorter. If a sealer coat is part of the qualifying system, it shall be applied in accordance with ASTM F718 as a third coat. If color chips or broadcast aggregate are being qualified as part of the system, do not apply to these panels.

4.13.3 Method 3 (types I, II, and III). Mild steel panels conforming to ASTM A568/A568M, cold rolled, approximately 15.2 centimeters by 30.5 centimeters by 0.32 centimeter (6 inches by 12 inches by ⅛ inch) shall be prepared in accordance with SSPC-SP 10/NACE NO. 2 surface preparation or better. The deck coating shall be conditioned and mixed in accordance with ASTM F718. Two coats of the color coat shall be applied to all exposed surfaces in accordance with ASTM F718 to produce a total DFT of 508±102 micrometers (20±4 mils). The final coat shall be cured at 23±2.5 °C (73±5 °F) for 7 days, or until full cure-to-service time in accordance with ASTM F718 is reached, whichever is shorter. If color chips, aggregate, or sealer coat are being qualified as part of the system, they shall be applied in accordance with ASTM F718 over the two color coats.

4.13.4 Method 4 (types I, II, and III). Mild steel panels conforming to ASTM A568/A568M, cold rolled, approximately 15.2 centimeters by 30.5 centimeters by 0.64 centimeter (6 inches by 12 inches by ¼ inch) shall be prepared in accordance with SSPC-SP 10/NACE NO. 2 surface preparation or better. The deck coating shall be conditioned and mixed in accordance with ASTM F718. Two coats of the color coat shall be applied to all exposed surfaces in accordance with ASTM F718 to produce a total DFT of 508±102 micrometers (20±4 mils). The final coat shall be cured at 23±2.5 °C (73±5 °F) for 7 days, or until full cure-to-service time in accordance with ASTM F718 is reached, whichever is shorter. If color chips, aggregate, or sealer coat are being qualified as part of the system, they shall be applied in accordance with ASTM F718 over the two color coats.

4.13.5 Method 5 (type IV and V). Mild steel panels conforming to ASTM A568/A568M, cold rolled, approximately 15.2 centimeters by 30.5 centimeters by 0.32 centimeter (6 inches by 12 inches by ⅛ inch) shall be prepared in accordance with SSPC-SP 10/NACE NO. 2 surface preparation or better. The complete qualifying system shall be conditioned and applied in accordance with ASTM F718 to the maximum application thickness identified in 3.4.

4.13.6 Method 6 (type IV). Mild steel panels conforming to ASTM A568/A568M, cold rolled, approximately 15.2 centimeters by 30.5 centimeters by 0.32 centimeter (6 inches by 12 inches by ⅛ inch) shall be prepared in accordance with SSPC-SP 10/NACE NO. 2 surface preparation or better. A deck primer and underlayment system qualified to MIL-DTL-24441, type IV, and MIL-PRF-3135, type I or III, class 2, or a direct-to-metal underlayment system qualified to MIL-PRF-3135, type IV, class 2, shall be applied to a thickness of 0.64 centimeter (¼ inch) in accordance with ASTM F718. Once the underlayment has reached the manufacturer-specified cure time, the complete qualifying system shall be conditioned and applied in accordance with ASTM F718 to the maximum application thickness identified in 3.4.

4.13.7 Method 7 (type V). Mild steel panels conforming to ASTM A568/A568M, cold rolled, approximately 15.2 centimeters by 30.5 centimeters by 0.64 centimeter (6 inches by 12 inches by ¼ inch) shall be prepared in accordance with SSPC-SP 10/NACE NO. 2 surface preparation or better. The complete qualifying system shall be conditioned and applied in accordance with ASTM F718 to the maximum application thickness identified in 3.4.

4.13.8 Method 8 (type IV). Mild steel panels conforming to ASTM A568/A568M, cold rolled, approximately 15.2 centimeters by 30.5 centimeters by 0.64 centimeter (6 inches by 12 inches by ¼ inch) shall be prepared in accordance with SSPC-SP 10/NACE NO. 2 surface preparation or better. A deck primer and underlayment system qualified to MIL-DTL-24441, type IV, and MIL-PRF-3135, type I or III, class 2, or a direct-to-metal underlayment system qualified to MIL-PRF-3135, type IV, class 2, shall be applied to a thickness of 0.64 centimeter (¼ inch) in accordance with ASTM F718. Once the underlayment has reached the manufacturer-specified cure time, the complete qualifying system shall be conditioned and applied in accordance with ASTM F718 to the maximum application thickness identified in 3.4.

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4.13.9 Method 9 (type V). Mild steel panels conforming to ASTM A568/A568M, cold rolled, approximately 10.2 centimeters by 10.2 centimeters by 0.32 centimeter (4 inches by 4 inches by ⅛ inch) with a 0.64-centimeter (¼-inch) diameter hole in the center shall be prepared in accordance with SSPC-SP 10/NACE NO. 2 surface preparation or better. The complete qualifying system shall be conditioned and applied in accordance with ASTM F718 to the maximum application thickness identified in 3.4. If a sealer coat is part of the qualifying system, it shall be applied in accordance with ASTM F718 as a third coat. If color chips or broadcast aggregate are being qualified as part of the system, do not apply to these panels.

4.13.10 Method 10 (type IV). Mild steel panels conforming to ASTM A568/A568M, cold rolled, approximately 10.2 centimeters by 10.2 centimeters by 0.32 centimeter (4 inches by 4 inches by ⅛ inch) with a 0.64-centimeter (¼-inch) hole in the center shall be prepared in accordance with SSPC-SP 10/NACE NO. 2 surface preparation or better. A deck primer and underlayment system qualified to MIL-DTL-24441, type IV, and MIL-PRF-3135, type I or III, class 2, or a direct-to-metal underlayment system qualified to MIL-PRF-3135, type IV, class 2, shall be applied to a thickness of 0.32 centimeter (⅛ inch) in accordance with ASTM F718. Once the underlayment has reached the manufacturer-specified cure time, the qualifying system shall be conditioned and applied in accordance with ASTM F718 to the maximum application thickness identified in 3.4. If a sealer coat is part of the qualifying system, it shall be applied in accordance with ASTM F718 as a third coat. If color chips or broadcast aggregate are being qualified as part of the system, do not apply to these panels.

4.13.11 Method 11 (type VI). Mild steel panels conforming to ASTM A568/A568M, cold rolled, approximately 15.2 centimeters by 30.5 centimeters by 0.64 centimeter (6 inches by 12 inches by ¼ inch) shall be prepared in accordance with SSPC-SP 10/NACE NO. 2 surface preparation or better. If required, the panel shall be primed using a coating conforming to MIL-DTL-24441, type IV. The complete deck covering system shall be conditioned and applied in accordance with ASTM F718 to the maximum application thickness identified in 3.4.

4.13.12 Method 12 (type VI). Mild steel panels conforming to ASTM A568/A568M, cold rolled, 10.2 centimeters by 10.2 centimeters by 0.32 centimeter (4 inches by 4 inches by ⅛ inch) with a 0.64-centimeter (¼-inch) hole in the center shall be prepared to a SSPC-SP 10/NACE NO. 2 surface preparation or better. If required, the panel shall be primed using a coating conforming to MIL-DTL-24441, type IV. The complete deck covering system shall be conditioned and applied in accordance with ASTM F718 to the maximum application thickness identified in 3.4.

4.14 Test procedures for types I, II, and III.

4.14.1 Shelf life. The deck coating shall be tested in accordance with ASTM D1849 and stored at 60±2.5 °C (140±5 °F) for a period of 14 days to determine conformance to 3.6.1.

4.14.2 Gloss. One test panel shall be prepared in accordance with 4.13.1. The test panel shall be dry-hard in accordance with ASTM D1640/D1640M at 23±2.5 °C (73±5 °F) prior to testing. The 60-degree specular gloss of the cured coating shall be determined in accordance with ASTM D523. The results shall conform to 3.6.2.

4.14.3 Abrasion resistance. Three test panels shall be prepared in accordance with 4.13.2. Abrasion resistance shall be tested in accordance with ASTM D4060 using a CS 17 wheel and a 1-kilogram (2.2-pound) load for 1,000 cycles. The results shall conform to 3.6.3.

4.14.4 Impact resistance. Three test panels shall be prepared in accordance with 4.13.4. Impact resistance shall be tested in accordance with ASTM D2794 using a 1.59-centimeter (1/16-inch) diameter punch to impact the coated side of the panel in order to determine conformance to 3.6.4. The specimen support shall consist of three steel balls, each 2.54 centimeters (1 inch) in diameter, equally spaced over a rigid steel base so that a circle drawn through the center of the balls is 12.7 centimeters (5 inches) in diameter. The three balls shall be firmly attached to the base plate, and the balls and the base plate shall weigh not less than 4.5 kilograms (10 pounds).

4.14.5 Slip resistance. Three test panels shall be prepared in accordance with 4.13.3. Slip resistance shall be tested in accordance with ASTM D2047 or ASTM C1028 to determine conformance to 3.6.5.

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4.14.6 Chemical resistance. Three test panels shall be prepared in accordance with 4.13.3. Chemical resistance shall be tested in accordance with ASTM D1308, spot test, covered procedure, at 23±2.5 °C (73±5 °F) for 24 hours with the reagents listed below. The test shall begin no later than 12 hours from the cure-to-service time specified by ASTM F718. Examinations shall be made at the start time, 2 hours, and 12 hours following chemical removal, and shall conform to 3.6.6.

a. Reagent water (ASTM D1193, type IV)

b. 10W-40 oil (SAE J300)

c. JP-5 jet fuel (MIL-DTL-5624)

4.14.6.1 AFFF resistance (type III only). Two test panels shall be prepared in accordance with 4.13.3 and tested in accordance with 4.14.6 for 30 days with the additional reagents listed below. The panels shall be visually examined immediately following exposure to reagents and 24 hours after air-drying to determine conformance to 3.6.6.1. The hardness shall also be evaluated 24 hours after air-drying in accordance with ASTM D3363 to determine conformance to 3.6.6.1.

a. AFFF (MIL-F-24385, type 3)

b. AFFF (MIL-F-24385, type 6)

4.14.7 Salt spray (fog) resistance (type II only). Three test panels shall be prepared in accordance with 4.13.3. The panel shall be exposed to 5 percent salt spray for 14 days in accordance with ASTM B117. Upon removal, the panels shall be washed gently in warm running water (not more than 38 °C [100 °F]) until free from any visible salt deposits and then examined. The results shall conform to 3.6.7.

4.15 Test procedures for types IV and V.

4.15.1 Chemical-resistant monolithic floorings. Test samples shall be prepared in accordance with ASTM C722. When test panels are required, they shall be prepared in accordance with 4.13.5 for type V deck coverings or 4.13.6 for type IV deck coverings. The deck coverings shall be tested in accordance with ASTM C722 and the results shall conform to the requirements of 3.7.1.

4.15.2 Chemical resistance. Four test panels shall be prepared in accordance with 4.13.5 for type IV and type V deck coverings. The deck covering shall be tested in accordance with ASTM D1308, spot test, covered procedure for 24 hours at 23±2.5 °C (73±5 °F) with the reagents listed below. The 60-degree specular gloss shall be measured in accordance with ASTM D523. Examinations shall be made at the start time, 2 hours, and 12 hours following chemical removal and shall conform to the requirements of 3.7.2.

a. 10W-40 oil (SAE J300)

b. JP-5 jet fuel (MIL-DTL-5624)

c. AFFF (MIL-F-24385, type 3)

4.15.3 Corrosion resistance. One test panel shall be prepared in accordance with 4.13.5 for type IV and type V deck coverings and tested in accordance with ASTM D1308, immersion procedure, for 15 days at 23±2.5 °C (73±5 °F) in substitute ocean water (ASTM D1141). Examination shall occur immediately following removal from reagent and results shall conform to the requirements of 3.7.3.

4.15.4 Impact resistance. Three test panels shall be prepared in accordance with 4.13.7 for type V deck coverings or 4.13.8 for type IV deck coverings. Impact resistance shall be tested in accordance with ASTM D2794 using a 1.59-centimeter (⅝-inch) diameter punch to impact the covered side of the panel in order to determine conformance with 3.7.4. The specimen support shall consist of three steel balls, each 2.54 centimeters (1 inch) in diameter, equally spaced over a rigid steel base so that a circle drawn through the center of the balls is 12.7 centimeters (5 inches) in diameter. The three balls shall be firmly attached to the base plate and the balls and the base plate shall weigh not less than 4.5 kilograms (10 pounds).

4.15.5 Indentation resistance. Three test panels shall be prepared in accordance with 4.13.5 for type V deck coverings or 4.13.6 for type IV deck coverings. Deck covering systems shall be permitted to cure for 96 hours or the cure-to-service time specified by ASTM F718, whichever is shorter. Indentation resistance shall be tested in accordance with ASTM F1914 to determine conformance with 3.7.5.

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4.15.6 Vertical sag (type V only). The bottom 10.2 centimeters (4 inches) of one test panel shall be prepared in accordance with 4.13.5 for type V deck coverings or 4.13.6 for type IV deck coverings. Immediately following application of entire system, the panel shall be oriented in a vertical position (90 degrees) on a horizontal support surface with the bare area of the panel above the application area for 24 hours at 25±2 °C (73±5 °F). The thickness results of a cross-section of the specimen shall conform to the requirements of 3.7.6.

4.15.7 Abrasion resistance. Three test panels shall be prepared in accordance with 4.13.9 for type V deck coverings or 4.13.10 for type IV deck coverings. The deck covering shall be tested in accordance with ASTM D4060 using a CS 17 wheel and a 1-kilogram (2.2-pound) load for 1,000 cycles. The results shall conform to the requirements of 3.7.7.

4.16 Test procedures for type VI.

4.16.1 Indentation resistance. Three test panels shall be prepared in accordance with 4.13.11. The deck covering indentation resistance shall be tested in accordance with ASTM F1914 to determine conformance to 3.8.1.

4.16.2 Impact resistance. Three test panels shall be prepared in accordance with 4.13.11. The deck covering shall be tested in accordance with ASTM D2794 using a 1.59-centimeter (⅝-inch) diameter punch to impact the covered side (direct impact) in order to determine conformance to 3.8.2. The specimen support shall consist of three steel balls, each 2.54 centimeters (1 inch) in diameter, equally spaced over a rigid steel base so that a circle drawn through the center of the balls is 12.70 centimeters (5 inches) in diameter. The three balls shall be firmly attached to the base plate and the balls and the base plate shall weigh not less than 4.5 kilograms (10 pounds).

4.16.3 Moisture absorption. Three test specimens shall be prepared in accordance with ASTM C413, mold method B. The deck covering shall be tested in accordance with ASTM C413 to determine conformance to 3.8.3.

4.16.4 Bond strength. Three test panels shall be prepared in accordance with ASTM C482 and 4.13.11. The deck covering shall be tested in accordance with ASTM C482 to determine conformance to 3.8.4

4.16.5 Latex cement concrete. The deck covering shall be tested in accordance with ASTM C1439 to determine conformance to 3.8.5.

4.16.6 Slip resistance. One test panel shall be prepared in accordance with 4.13.11. The deck covering shall be tested in accordance with ASTM D2047 or ASTM C1028 to determine conformance to 3.8.6.

4.16.7 Sparking resistance. One test panel shall be prepared in accordance with 4.13.11. The deck covering shall be tested by abrading the specimen with a rotating stiff steel wire wheel attached to an electric or pneumatic drill and by striking the specimens with glancing blows by a steel hammer. These tests shall be run in a darkened room and the presence or absence of sparks shall be noted. The results shall conform to the requirements of 3.8.7.

4.16.8 Electrical resistance. Three test panels shall be prepared in accordance with 4.13.11. The deck covering shall be tested in accordance with ASTM D257 to determine conformance to 3.8.8, utilizing the following:

a. Electrode: The electrode shall be 6.35 centimeters (2.5 inches) in diameter, weigh 2.27 kilograms (5 pounds), and have a rubber pad base of 55 durometer hardness cemented to one face. The contact surface of the electrode shall be covered with a sheet of aluminum foil held to the sides of the electrode with elastic bands.

b. Method of measurement: Direct-reading instrument.

c. Applied voltage: 500 volts.

4.16.9 Abrasion resistance. Three test panels shall be prepared in accordance with 4.13.12. The deck covering shall be tested in accordance with ASTM D4060 using the CS 17 wheel and a 1-kilogram (2.2-pound) load for 1,000 cycles. The results shall conform to the requirements of 3.8.9.

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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 packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. Materials covered by this document are intended for use as deck coverings on U.S. Navy ships. Type I coatings are abrasion resistant and are for use on interior, dry, walking surfaces. Type II coatings, also abrasion resistant, are corrosion resistant and are for use on interior, wet, walking surfaces. Type III coatings are AFFF resistant for use on the deck of AFFF stations. Type IV deck coverings are for use on interior walking surfaces with an underlayment. Type V deck coverings are for use on interior walking surfaces without an underlayment. Type VI concrete is for use in areas requiring spark resistance, like magazines. Class 1 deck coverings are not required to be off-gas tested and may be used aboard surface ships. Class 2 deck coverings are required to be off-gas tested and may be used aboard both surface ships and submarines. Grade A deck coverings must have a VOC not greater than 250 g/L (2.08 lb/gal). Grade B deck coverings must have a VOC not greater than 340 g/L (2.84 lb/gal). The resin chemistry is used to determine the composition as E, P, or O.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Type, class, grade, and composition (see 1.2).

c. Identification characteristics (see 3.4).

d. Manufacturer's directions for use (ASTM F718) (see 3.5).

e. When conformance inspection is required (see 4.3).

f. Additional fire testing provisions (see 4.6.1 and 6.6).

g. Metals content (see 4.9).

h. Hazardous air pollutant (HAP) content (see 4.11).

i. Packaging and labeling requirements (see 5.1 and 6.10).

j. When a Safety Data Sheet (SDS) is required (see 6.5).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL No. 32584 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Commander, Naval Sea Systems Command, ATTN: SEA 05S, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard DC 20376-5160 or emailed to CommandStandards@navy.mil. An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at https://assist.dla.mil.

6.4 Supersession data. This specification supersedes MIL-PRF-24613A of 3 November 2007, MIL-PRF-32171B of 27 August 2009, MIL-D-21631A of 21 August 1974 and Amendment of 17 November 1981, and MIL-D-3134J of 5 October 1988 and Amendment of 12 September 1989.

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6.5 Safety data sheet. When specified (see 6.2), contracting officers will identify those activities requiring copies of completed Safety Data Sheets (SDS) prepared in accordance with Appendix D of 29 CFR 1910.1200. In order to obtain the SDS, federal acquisition regulation (FAR) clause 52.223-3 will be in the contract. The contracting activity should be given an SDS at the time of contract award.

6.6 Additional fire testing provisions. NAVSEA reserves the right to witness the tests, and perform any of the tests set forth herein where such testing is deemed necessary to assure compliance to prescribed requirements of the qualification tests. NAVSEA will provide a letter that indicates the approved laboratories which are accredited to ISO/IEC 17025 and which details how to obtain and maintain accreditation (see 6.2).

6.7 Material certification. Materials to be installed in submarines are to be controlled to prevent off-gassing, which contaminates the submarine's atmosphere and can result in health hazards to personnel or deleterious effects on machinery. These controls are administered through the Submarine Material Control Program, which is described in the Nuclear Powered Submarine Atmosphere Control Manual, S9510-AB-ATM-010 chapter titled "Material Control Program." Under the Submarine Material Control Program, all materials considered for use on submarines require certification and assignment of a usage category. Under the certification process, candidate materials are selected by Navy activities or contractors, and a request for certification is submitted to Commander, Naval Sea Systems Command, ATTN: SEA 05S, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard, DC 20376-5160 or emailed to CommandStandards@navy.mil. The certification request is accompanied by detailed information, including descriptions of the material, method of application, usage, and storage. A chemical analysis is conducted, which can be accomplished through off-gas testing. If off-gas testing is required, it must be conducted in a Government approved laboratory. Information pertaining to this test requirement may be obtained from Commander, Naval Sea Systems Command, ATTN: SEA 05S, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard, DC 20376-5160 or emailed to CommandStandards@navy.mil. Based on the chemical analysis results, a usage category is assigned to the material defining whether, and to what extent, the material may be used on submarines.

6.8 Toxicity evaluation. The NMCPHC requires sufficient information to permit an HHA of the product. Upon completion of the HHA, a copy will be provided by the NMCPHC to the Government for evaluation. The HHA process is described on the NMCPHC's website, http://www.med.navy.mil/sites/nmcphc/industrial-hygiene/Pages/health-hazard-assessment.aspx.

6.9 Clarification of terms. Within this specification, the coating "parts" refers to the individual coating components (e.g., resin, hardener, etc.) that are mixed for application and cure of the coating. The system "components" refers to the individual coats or broadcast material (e.g., primer, topcoat, base/color coat, chips/broadcast, sealer coat, etc.) that make up the coating or deck covering system.

6.10 Packaging recommendations. Suggested packaging requirements for direct Government acquisitions are contained in table III (see 6.2).

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TABLE III. Packaging.

Packaging	Recommended requirements for direct Government acquisitions
Containers	1. The components should be furnished in cans appropriate to kit requirements capable of holding 0.47 liter (1 pint), 0.945 liter (1 quart), 3.78 liters (1 gallon), and 18.9 liters (5 gallons). Kits should consist of multiple containers, one of which should be large enough to contain all components for mixing purposes. Not all components are required to be supplied in a single can.
	2. Multiple friction plug containers should be in accordance with PPP-C-96, type V, class 2. Interior coatings should be as specified therein. Wire handles, as specified therein, should be provided for the 1-gallon container. Closure of the properly filled and sealed cans should be as specified in the appendix thereto.
	3. All shipping containers should comply with the requirements of the Uniform Freight Classifications (UFC), the National Motor Freight Classification (NMFC), and the applicable requirements of 49 CFR and all UN Model Regulations.
	4. Unit of procurement: the deck covering materials covered by this specification should be purchased by volume. The unit of procurement should be in multiples of 1 liter or 1 U.S. liquid gallon at 15.5 °C (60 °F).
Packaging to ASTM D3951	1. Packaging considered commercial in nature should conform to the requirements of ASTM D3951.
	2. All containers should comply with the requirements of the UFC, the NMFC, and the applicable requirements of 49 CFR and all UN Modal Regulations.
Level of Pack (Packaging should be specified as follows)	1. Overseas delivery packaging. Intermediate containers of like-size kits of deck covering material should be packed in close-fitting wood boxes conforming to ASTM D6251/D6251M, overseas type, or ASTM D6880/D6880M, class 2. Box closure and strapping should be as specified in the applicable box specification or the appendix thereto, except that strapping should be flat and the finish B.
	2. Domestic delivery (level B) packing. Level B packing should be as for level A, except that boxes should be domestic type or class and the strapping should be finish A or B.
Palletization	Intermediate containers should be palletized in accordance with MIL-STD-147.
Packing for acquisitions involving direct delivery to Navy ships or installations	Treated lumber and plywood. All lumber and plywood, including laminated veneer materials, used in shipping container and pallet construction, member, blocking, bracing, and reinforcing must be fire-retardant treated material in accordance with MIL-L-19140 as follows: a. General use, weather resistant: MIL-L-19140, type II, category I. b. General use, non-weather resistant: MIL-L-19140, type I, category I.
Unit kits	The deck covering materials covered by this specification should be packed and packaged as kits.
Safety data sheets (SDS) and product/procedure data sheets	A copy of the SDS and company product data/procedure sheets should be attached to the shipping document for each destination (see 6.5).

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TABLE III. Packaging – Continued.

Hazardous warnings	1. Labels should be in accordance with 29 CFR Parts 1910, 1915, 1917, 1918, 1926, and 1928, and 49 CFR.
	2. All individual containers should have the following marking (except type VI): "CAUTION: this material contains volatile solvents, with probable hazardous vapors. Use with adequate ventilation. Avoid prolonged breathing of vapors or spray mists. The solvents are highly flammable; avoid open flame and smoking."
	3. Each component container, shipping container, and palletized load should be marked with the appropriate hazardous symbol.
	4. Unit containers should be marked: "This product is asbestos, lead, chromium, and cadmium free, except for possible trace levels." Types V, VI, and VII should also be marked: "This product is free of volatile organic hazardous air pollutants (VOHAPS/HAPS), except for possible trace levels."
Volatile organic content (VOC)	VOC should be stated on the label using the following statement: "Contains (insert VOC content) grams per liter (insert VOC content in lb/gal) of volatile organic content per 40 CFR 60, Appendix A-7, Method 24."
Hazardous air pollutants (HAPs)	HAPs should be stated on the label using the following statement: "Contains (insert HAP content here in g/L and lb/gal) solids (nonvolatiles) per 40 CFR 63."
Shelf life	Labels should include the product's shelf life expiration date and meet the requirements of MIL-STD-129.
Application instructions	Manufacturers of decking materials are required to include an ASTM F718 with each shipment of the material covered by this specification.

6.10 Subject term (key word) listing.

Cement

Coating

Color flake

Concrete

Cosmetic polymeric

Deck paint

High durability

Light-weight concrete

Mastic

On-deck insulation

PRC

Terrazzo

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CONCLUDING MATERIAL

Custodians:
Army – AV
Navy – SH
Air Force – 11

Review activities:
Army – MI, MR, TE
Navy – AS, CG, MC
Air Force – 20
DLA – CD

Preparing activity:
Navy – SH
(Project 8010-2016-005)

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