METRIC

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(See 6.10)

MILITARY SPECIFICATION

ENAMEL, INTERIOR, NONFLAMING (DRY), CHLORINATED ALKYD RESIN, SEMIGLOSS (METRIC)

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

1. SCOPE

1.1 Scope. This specification covers enamel, interior, nonflaming (dry), chlorinated alkyd resin, semigloss.

1.2 Classification. Enamel shall be of the following colors, as specified (see 6.2.1):

(a) Beach-sand, semigloss, formula no. MSTS-3
(b) Rose-wood, semigloss, formula no. MSTS-8
(c) Clipper blue, semigloss, formula no. MSTS-9
(d) Sun glow, semigloss, formula no. MSTS-15
(e) Soft white, semigloss, formula no. 124 (see 6.6)
(f) Pastel green, semigloss, formula no. 125
(g) Bulkhead gray, semigloss, formula no. 126
(h) Green gray, semigloss, formula no. 127
(i) Yellow gray, semigloss, formula no. 128
(j) Pearl gray, semigloss, formula no. 130
(k) Pastel blue, semigloss, formula no. 131

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 55Z3, 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.

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2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

TT-P-645 - Primer, Paint, Zinc-Chromate, Alkyd Type.
TT-T-291 - Thinner, Paint, Mineral Spirits, Regular and Odorless.
PPP-P-1892 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing, and Marking of.

MILITARY

DOD-P-15328 - Primer (Wash), Pretreatment, (Formula No. 117 for Metals) (Metric).
DOD-R-21417 - Resin, Chlorinated Alkyd, Solution (Metric).

STANDARDS

FEDERAL

FED-STD-141 - Paint, Varnish, Lacquer, and Related Materials; Methods for Inspection, Sampling and Testing.
FED-STD-313 - Material Safety Data Sheets, Preparation and Submission of.
FED-STD-595 - Colors.

(Copies of specifications and standards required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 209 - Standard Specification for Lampblack Pigment.
D 261 - Standard Specification for Iron Blue Pigment.
D 332 - Standard Test Methods for Tinting Strength of White Pigments. (DoD adopted)
D 523 - Standard Test Methods for Specular Gloss. (DoD adopted)
D 562 - Standard Test Method for Consistency of Paints Using the Stormer Viscometer. (DoD adopted)

D 656 - Standard Specification for Pure Toluidine Red Toner.
D 1210 - Standard Test Method for Fineness of Dispersion of Pigment-Vehicle Systems. (DoD adopted)
D 1296 - Standard Test Method for Odor of Volatile Solvents and Diluents. (DoD adopted)
D 1394 - Standard Method for Chemical Analysis of White Titanium Pigments. (DoD adopted)
D 1475 - Standard Test Method for Density of Paint, Varnish, Lacquer, and Related Products. (DoD adopted)
D 1729 - Standard Practice for Visual Evaluation of Color Differences of Opaque Materials. (DoD adopted)
D 2244 - Standard Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates. (DoD adopted)
D 2369 - Standard Test Method for Volatile Content of Coatings. (DoD adopted)
D 3278 - Standard Test Methods for Flash Point of Liquids by Setaflash Closed-Cup Apparatus. (DoD adopted)
D 3335 - Standard Test Method for Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy.
D 3359 - Standard Methods for Measuring Adhesion by Tape Test. (DoD adopted)
E 162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source. (DoD adopted)

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

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Rules and Regulations - Rule 102

(Application for copies should be addressed to the South Coast Air Quality Management District, 9150 E. Flair Drive, El Monte, CA 91731.)

(Nongovernment standards and other publications are normally available from the organizations which prepare or which 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 specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Composition. Enamel shall consist of ingredients in the proportions specified in table I. Additional tinting pigments may be added as necessary to conform to color requirements.

TABLE I. Formulations.[1]

Color	FED-STD-595 number	Barytes [2]	Titanium dioxide [3]	Yellow [7]	Toluidine red [4]	Lamp black [4]	Iron blue [4]	Chlorinated alkyd [4]	Paint thinner [4]	Drying agent [6]	Anti-settling agent [5]	Anti-skinning agent [5]
Beach-sand	22563	505	350	-	2	0.2	---	465	150	-	5	1
Rose-wood	22519	500	350	-	2	.2	---	465	150	-	5	1
Clipper blue	24516	515	350	-	---	.8	0.8	465	150	-	5	1
Sun glow	23697	495	350	-	0.5	.03	---	465	150	-	5	1
Soft white	27880	525	350	-	---	---	---	465	150	-	5	1
Pastel green	24585	520	350	-	---	---	0.8	465	150	-	5	1
Bulkhead gray	26307	500	350	-	1	4.5	---	465	150	-	5	1
Green gray	26496	515	350	-	0.4	1.2	---	465	150	-	5	1
Yellow gray	26400	510	350	-	0.8	0.5	---	465	150	-	5	1
Pearl gray	26493	525	350	-	---	1.3	---	465	150	-	5	1
Pastel blue	25526	525	350	-	0.2	0.7	0.9	465	150	-	5	1

[1] Use of mass units in pounds results in a volume slightly in excess of 100 gallons. Mass units in kilograms (kg) results in a volume of approximately 832 liters (L).

[2] The barytes shall contain a minimum of 98.0 percent barium sulfate, a maximum of 0.15 percent water soluble salts, and be of fine particle size with 96 percent by mass less than 10 micrometers (µm), and 60 percent less than 5 µm when determined by any sedimentation method accurate to within 1 µm.

[3] The titanium dioxide pigment shall contain by weight not less than 94 percent titanium dioxide and between 0.5 and 2.5 percent aluminum oxide. It shall be a semichalking rutile type in accordance with ASTM D 332.

[4] The following ingredients shall conform to the applicable specification listed herein.

Toluidine red - ASTM D 656
Lampblack - ASTM D 209
Iron blue - ASTM D 261
Chlorinated alkyd - DOD-R-21417
Paint thinner - TT-T-291, type I

[5] The amounts of antiskinning agent and antisettling agent may be adjusted to meet the requirements of the finished enamel. The agents shall be effective for their purpose in small amounts in the order indicated.

[6] The amount and type of drying agent shall be left to the discretion of the contractor. The drying agent shall produce paint which conforms to the drying time requirements and shall not contain lead.

[7] If necessary, the enamel shall be tinted with a lead-free, asbestos-free, color and heat stable yellow pigment to obtain the designated FED-STD-595 color.

3.2 Toxicity. The material shall have no adverse effect on the health of personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the contracting activity to the appropriate departmental medical service who will act as an advisor to the contracting activity (see 4.5).

3.3 Quantitative requirements. The enamel shall conform to the quantitative characteristics specified (see tables II and III). Lead in any form shall not be present in the dry film in quantities greater than 0.06 percent (600 parts per million (p/m)).

TABLE II. Quantitative characteristics applicable to all colors.

Characteristic	Minimum	Maximum
Pigment, percent by mass of enamel	57.0	60.5
Volatiles, percent by mass of enamel	20.5	23.0
Nonvolatile vehicle, percent by mass of enamel	18.5	21.0
Chlorinated dibasic acid, percent by mass of nonvolatile vehicle	45.0	-----
Chlorine, percent by mass of chlorinated dibasic acid	51.0	-----
Coarse particles, percent by mass of enamel	-----	0.1
Consistency, Krebs-Stormer:		
Grams at 200 r/min	200	255
Krebs units	82	90
Density, kg/L (lb/gal)	1.73 (14.4)	1.80 (15.0)
Fineness of grind	6	-----
Drying time, hours:		
Set to touch	-----	2
Dry hard	-----	6
Specular gloss, degrees	35	60
Flash point, °C (°F)	37.7 (100)	-----

TABLE III. Quantitative characteristics, applicable to specific colors.

Color	Characteristic	
	Titanium dioxide, minimum percent by mass of pigment	Barium sulfate, minimum percent by mass of pigment
Beach-sand	38.0	54.2
Rose-wood	38.0	53.7
Clipper blue	38.0	55.3
Sun glow	37.5	52.5
Soft white	38.0	56.4
Pastel green	38.0	55.7
Bulkhead gray	38.0	53.7
Green gray	38.0	55.3
Yellow gray	38.0	54.8
Pearl gray	38.0	56.4
Pastel blue	38.0	56.4

3.4 Volatile portion. The volatile portion of the enamel shall conform to the following requirements by volume:

(a) A combination of hydrocarbons, alcohols, aldehydes, ethers, esters, or ketones having an olefinic or cycloolefinic type of unsaturation, except perchloroethylene: 5 percent maximum.
(b) A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene, methyl benzoate, and phenyl acetate: 8 percent, maximum.
(c) A combination of ethylbenzene, ketones having branched hydrocarbon structures, trichloroethylene, or toluene: 20 percent, maximum.

3.5 Qualitative characteristics. The enamel shall conform to the following qualitative characteristics.

3.5.1 Odor. The odor shall be characteristic of the volatiles permitted (see 4.4).

3.5.2 Condition in container. A freshly opened, full container of enamel, shall be free from lumps, abnormal thickening, or livering. It shall show no more pigment settling or caking than can be readily reincorporated to a smooth, uniform state (see 4.4.8).

3.5.3 Storage stability. The enamel shall conform to 3.5.3.1 and 3.5.3.2.

3.5.3.1 Partially full container. A three-quarter filled, closed 225 milliliter (mL) 8-ounce glass jar of enamel shall show no skinning at the end of 48 hours, and after aging as specified, the enamel shall show no livering, curdling, hard caking, or gummy sediment. It shall mix readily to a smooth, uniform state and skins formed shall be continuous and easily removed (see 4.4.9.1).

3.5.3.2 Useability. Enamel in original, unopened containers shall be usable for a period of 1 year of normal warehouse storage after date of manufacture. The enamel shall redisperse into a uniform condition; free from livering, curdling, gelling, or other objectionable properties; not to exceed 100 Krebs units in consistency; not to exceed 8 hours dry hard time; match the standard color card; and have a gloss not greater than 60 and not less than 35 (see 4.4.9.2).

3.5.4 Adhesion. The enamel shall show good adhesion (see 4.4.10).

3.5.5 Appearance. Panels prepared as specified (see 4.4.10) shall show no evidence of wrinkling or any other film defects and shall have a smooth and uniform appearance.

3.5.6 Color. The color shall match the applicable color of FED-STD-595 as listed in table I (see 4.4.11).

3.5.7 Compatibility. There shall be no evidence of incompatibility of any of the ingredients of the enamel (see 4.4.12).

3.5.8 Antisagging properties. There shall be no sagging (see 4.4.13).

3.5.9 Nonflaming property. The enamel shall be resistant to burning and shall show no flaming or dripping and have an average flame spread index of 8 with no individual specimen having a flame spread index over 10 (see 4.4.14).

3.6 Material safety data sheet. The contracting activity shall be provided a material safety data sheet (MSDS) at the time of contract award. The MSDS is form OSHA-20 and found as part of FED-STD-313. The MSDS shall be included with each shipment of the material covered by this specification (see 6.8).

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 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 assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must 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 assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2 Quality assurance. Quality assurance shall be provided in accordance with method 1031 of FED-STD-141, and as hereinafter supplemented. The useability requirement (see 3.5.3.2) shall apply for 1 year after manufacture regardless of other testing or prior acceptance of material.

4.3 Quality conformance inspection. Quality conformance inspection shall be as specified in 4.3.1 and 4.3.2.

4.3.1 Lot. A lot shall consist of all paint of the same formula number from a single, uniform batch, or uniform blend of batches offered for delivery at one time.

4.3.2 Sampling. A sample of 0.5 L (1 pint) of the chlorinated alkyd resin and, when requested by the contracting activity, 0.5 L (1 pint) of petroleum spirits and 0.25 L (1/2 pint) of the remaining ingredients in the formula listed in table I shall be taken for test purposes.

4.4 Test procedures. The finished enamel shall be tested in accordance with the methods specified in table IV, and as specified herein. Failure of any sample to pass any test and nonconformance to the requirements of this specification shall be cause for rejection of the lot represented by the sample.

TABLE IV. Test procedures.

Item	Test method		Test paragraph	Requirement paragraph
	FED-STD-141	ASTM		
Pigment content	4021	----	----	Table II
Volatiles	----	D 2369	----	Table II
Nonvolatile vehicle content	4053	----	----	Table II
Chlorinated dibasic acid	----	----	4.4.1	Table II
Chlorine content	----	----	4.4.2	Table II
Coarse particles and skins	4092	----	----	Table II
Consistency, Krebs-Stormer	----	D 562	----	Table II
Weight per gallon	----	D 1475	----	Table II
Fineness of grind	----	D 1210	----	Table II
Drying time	4061	----	4.4.3	Table II
Specular gloss, 60 degrees	----	D 523	4.4.4	Table II
Flash point	----	D 3278	----	Table II
Titanium dioxide	----	D 1394	4.4.5	Table III
Barium sulfate	7281	----	4.4.6	Table III
Lead	----	----	4.4.7	3.3
Odor	----	D 1296	4.4	3.5.1
Condition in container	3011	----	4.4.8	3.5.2
Stability partially full container	3021	----	4.4.9.1	3.5.3.1
Useability	----	----	4.4.9.2	3.5.3.2
Adhesion	----	----	4.4.10	3.5.4
Appearance	----	----	4.4.10	3.5.5
Color	----	D 1729 or D 2244	4.4.11	3.5.6
Compatibility	4203	----	4.4.12	3.5.7
Antisagging properties	----	----	4.4.13	3.5.8
Nonflaming property	----	E 162	4.4.14	3.5.9

4.4.1 Chlorinated dibasic acid. The chlorinated dibasic acid shall be determined on the extracted vehicle from the pigment determination. The extracted vehicle shall be evaporated until the nonvolatile is approximately 10 percent. The extracted vehicle shall be cooled, transferred to a stoppered flask, and the percent of nonvolatile determined. A sample containing about 1 gram of nonvolatile shall be weighed into a 500 mL of Erlenmeyer flask or equal with a ground-glass joint. One-hundred mL of benzene shall be dissolved in the sample of nonvolatile and 50 mL of 1N potassium hydroxide in isopropyl alcohol shall be added. Mixture shall be refluxed while stirring for 2 hours. The flask shall be stoppered, cooled, and allowed to stand overnight. Mixture shall then be filtered through a Gooch crucible, or equal, having a glass filter pad on the bottom, covered with diatomaceous earth. The flask and precipitate shall be washed with a solution of one volume of isopropyl alcohol to two volumes of benzene. After final washing with 25 mL of ethyl ether, air shall be drawn through the crucible for 1 minute. The filtrate shall then be discarded. The precipitate shall be washed from the flask through the crucible with about 100 mL of water. The washings shall be transferred to a separatory funnel and acidified with 1:4 sulfuric acid. The chlorinated dibasic acid shall be extracted with consecutive volumes of 75 mL, 50 mL, and 50 mL of ethyl ether. The ether extracts shall be collected and washed with water until the washings are acid-free. The ether shall then be transferred to a 250-mL beaker. Five mL of m-cresol purple indicator (0.025 gram in 100 mL of absolute ethyl alcohol) shall be added. Mixture shall be titrated to a purple end point with 0.2N potassium hydroxide in methyl alcohol.

$$\text{Percent chlorinated dibasic acid} = \frac{\text{mL of alkali X normality X } 19.45}{\text{gram of nonvolatile vehicle}}$$

4.4.2 Chlorine. Chlorine shall be determined using the Schoniger Low Pressure Combustion Apparatus or equal. Approximately 30 milligrams (mg) of nonvolatile vehicle shall be weighed from the nonvolatile determination of the evaporated, extracted vehicle, on a Schoniger or equal paper sample holder. The paper shall be folded over the sample and placed in the platinum sample holder on the flask head. Fifteen mL of N/10 sodium hydroxide shall be added to the flask. The flask shall be placed in the safety ignition unit and the sample shall be fired. The flask shall be allowed to cool, removed from the unit, and allowed to stand until the mist in the flask condenses. The flask shall be shaken vigorously to absorb vapors and then the solution shall be transferred to a 150 mL beaker. Five drops of chlorine indicator shall be added. (Chlorine indicator: 5.0 grams of chemically pure diphenyl carbazone and 1.0 gram of bromphenol blue indicator shall be dissolved in 1 L of 95 percent ethanol or propanol.) 0.2N nitrate acid shall be added until the color changes from purple to yellow. Then 4 drops excess shall be added. Mixture shall be titrated with a 0.025 N mercuric nitrate solution until the color of the solution changes from yellow to lavender.

$$\text{Percent chlorine in chlorinated dibasic acid} = \frac{\text{mL titration X normality of mercuric nitrate X } 355.0}{\text{gram sample X percent chlorinated dibasic acid in nonvolatile vehicle}}$$

4.4.3 Drying time. Drying time shall be determined in accordance with method 4061 of FED-STD-141, except that the specified conditions of temperature and humidity shall apply only for referee tests in case of dispute. Other tests shall be conducted under prevailing laboratory conditions.

4.4.4 Gloss. Gloss shall be determined in accordance with ASTM D 523. Forty-eight hours air-drying time in a room free from dust and fumes under prevailing laboratory conditions of temperature and humidity shall be allowed before making the reading.

4.4.5 Titanium dioxide. Four-tenths of a gram of extracted pigment shall be weighed into a 250 mL beaker. Twenty-five mL of 1:1 HC1 shall be added. Mixture shall be warmed on a steam bath for 15 minutes. Paper pulp (prepared by shaking ashless filter paper in distilled water until the paper is completely disintegrated) shall be added to the beaker. Mixture shall then be filtered on a close-grained paper. The residue shall be transferred quantitatively to the filter paper and washed thoroughly with hot water. Paper shall be transferred to a porcelain crucible and ashed at a moderate heat until all carbon has been removed. Ignited residue shall be returned to a 250 mL beaker. Fifteen grams of ammonium sulfate and 20 mL of concentrated H_2SO_4 shall be added. Mixture shall be heated strongly until complete solution of titanium dioxide has been effected. Procedure shall continue in accordance with ASTM D 1394.

4.4.6 Barium sulfate. Barium sulfate shall be determined in accordance with the applicable portions of method 7281 of FED-STD-141.

4.4.7 Lead content on nonvolatile. Lead content of nonvolatile shall be determined in accordance with ASTM D 3335.

4.4.8 Condition in container. Package condition shall be determined in accordance with method 3011 of FED-STD-141. Package condition shall meet the requirements specified in 3.5.2.

4.4.9 Storage stability. Storage stability shall be determined in accordance with 4.4.9.1 through 4.4.9.2.

4.4.9.1 Partially full container. Skinning shall be determined after 48 hours in accordance with method 3021 of FED-STD-141. Container shall be resealed and aged for 7 days at 22 to 27 degrees Celsius (°C) (72 to 80 degrees Fahrenheit (°F)). Container shall be examined for conformance to 3.5.3.1.

4.4.9.2 Useability. The Government, at its option and at any time not to exceed 1 year after manufacture, may test enamel stored in its original containers for condition in container, viscosity, color, gloss, and dry hard time.

4.4.10 Adhesion and appearance. One mild steel panel shall be coated with primer conforming to TT-P-645 to a dry film thickness of 0.002 to 0.0025 centimeters (cm) (0.8 to 1.0 mil). Another panel shall be coated with pretreatment primer conforming to DOD-P-15328 to a dry film thickness of 0.0008 to 0.0013 cm (0.3 to 0.5 mil). After 24 hours drying, both panels shall be coated with the enamel being tested to a dry film thickness of 0.004 to 0.005 cm (1.5 to 2.0 mils). Vertical strokes shall be used until the surface has been

covered; horizontal strokes shall be used to lay off. The panels shall be placed in a nearly vertical position to dry. After air drying for 48 hours, film shall be inspected for evidence of wrinkling, excessive brush marks, or other film defects. The film shall be subjected to the knife test in accordance with ASTM D 3359 to determine whether the paint exhibits good adhesion to each of the primers.

4.4.11 Color. Panel shall be prepared in accordance with 4.4.10. After a 48-hour drying period, panel shall be compared with the color specified (see table I) using the procedure specified in ASTM D 1729. If doubt exists after visual comparison as to the acceptability of the match, the color difference shall be determined using the instrument specified in ASTM D 2244. An acceptable color match shall be within 2 units.

4.4.12 Compatibility. Compatibility with thinner shall be determined in accordance with method 4203 of FED-STD-141. Fifty mL of enamel and 50 mL of petroleum spirits, conforming to type II, grade A of TT-T-291, shall be used. Observation for compatibility shall be made immediately after mixing and also 30 minutes after mixing.

4.4.13 Antisagging properties. A panel shall be coated to a wet film thickness of 0.004 to 0.005 cm (1.5 to 2.0 mils). A 0.010 cm (4 mils) clearance drawdown blade may be used. The panel shall be placed in a vertical position, and a blunt instrument shall immediately be drawn across the panel to obtain a line about 0.48 cm (3/16 inch) wide where the paint has been removed. The panel shall be dried in a vertical position. Panel shall be examined. The line shall remain essentially unchanged in width (a sag of not more than 0.04 cm (1/64 inch) shall be permitted), and there shall be no other evidence of sagging or running.

4.4.14 Nonflaming property. Three ordinary strength steel panels shall be prepared in accordance with 4.4.10 except that the drying time of the enamel shall be 14 days. The test specimen shall show no flaming or dripping and have an average flame spread index of 8 with no individual specimen having a flame spread index over 10 when tested in triplicate. The ordinary strength steel panels shall be tested in accordance with ASTM E 162 (see 3.5.9).

4.5 Certification data/report. When specified in the contract or order, a certification data/report shall be prepared (see 6.2.2).

4.6 Toxicological formulations. The contractor shall have the toxicological formulations and associated information available for review by the contracting activity to evaluate the safety of the material for the proposed use.

4.7 Inspection of packaging. Sample packages and packs, and the inspection of the preservation-packaging, packing and marking for shipment 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 Packaging and packing. The enamel shall be packaged and packed in accordance with PPP-P-1892. The level of packaging shall be level A or C and the level of packing shall be level A, B, or C, as specified (see 6.2.1). The enamel shall be furnished in 4-L (1-gallon) cans or 20-L (5-gallon) pails, as specified (see 6.2.1).

5.2 Marking. Containers shall be marked in accordance with PPP-P-1892.

5.2.1 Special marking. Special marking shall be as specified in 5.2.1.1 and 5.2.1.2.

5.2.1.1 Lead warning. All containers with coating materials containing lead in excess of 0.05 percent by mass of total nonvolatile content shall be marked with the following warning notice:

> "Caution: This coating contains toxic lead compounds. Do not use on interior surfaces of any items of furniture, machinery, or appliances to which children may be commonly exposed. Adequate precautions should be taken when spraying."

5.2.1.2 Volatile content. In addition to other markings required on the containers (see 6.2.1), there shall be the following statement: "The volatile content of the material in this container is not photochemically reactive as defined by Rule 102 of the South Coast Air Quality Management District." Label shall also be clearly marked to show the content of volatile organic compounds (VOC), less water and exempt solvents and of any instructions for any required thinning unless a statement prohibiting thinning under normal environmental and application conditions is included.

6. NOTES

6.1 Intended use. Enamels covered by this specification are intended for application over previously primed or painted surfaces of ships' interior metal bulkheads. The enamels are formulated to provide a decorative coating or dry film and are not intended to prevent the burning of wood or other combustible substrates, but will retard combustion to a limited extent.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

(a) Title, number, and date of this specification.
(b) Color of enamel (see 1.2).
(c) Selection of level of packaging and level of packing required (see 5.1).
(d) Size of container required (see 5.1).
(e) Special marking required (see 5.2.1.2).

6.2.2 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DoD FAR Supplement, Part 27, Sub-Part 27.410-6 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification are cited in the following paragraph.

Paragraph no.	Data requirement title	Applicable DID no.	Option
4.5	Certification data/report	UDI-A-23264	------

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DoD 5010.12-L., AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.2.2.1 The data requirements of 6.2.2 and any task in sections 3, 4, or 5 of this specification required to be performed to meet a data requirement may be waived by the contracting/acquisition activity upon certification by the offeror that identical data were submitted by the offeror and accepted by the Government under a previous contract for identical item acquired to this specification. This does not apply to specific data which may be required for each contract regardless of whether an identical item has been supplied previously (for example, test reports).

6.3 Volatile content. Although the container marking specifically refers to the Air Pollution District of Los Angeles County, the paint may be used anywhere else a product conforming to 3.4 is allowed. This includes other air pollution control districts or similar areas controlling the emission of solvents into the atmosphere.

6.4 Paint volume. The paints covered by this specification should be purchased by volume, the unit normally being 4 L or 1 U.S. liquid gallon at 20°C (68°F).

6.5 Composition by volume. For information only, and with the understanding that mass-volume relationships of ingredients may vary slightly, approximate formulae by volume are included in table V.

TABLE V. Composition by volume.[1]

Color	Barytes	Titanium dioxide	Chrome yellow	Toluidine red	Lamp black	Iron blue	Chlorinated alkyd	Petroleum spirits	Lead naphthenate	Cobalt naphthenate	Anti-settling agent	Anti-skinning agent	Total
Beach-sand	13.6	10.0	0.4	0.2	0.1	---	54.7	22.8	0.6	0.3	0.6	0.1	103.4
Rose-wood	13.5	10.0	.4	.3	.1	---	54.7	22.8	.6	.3	.6	.1	103.4
Clipper blue	13.9	10.0	.2	---	.05	0.05	54.7	22.8	.6	.3	.6	.1	103.3
Sun glow	13.4	10.0	.8	.04	.002	---	54.7	22.8	.6	.3	.6	.1	103.3
Soft white	14.2	10.0	---	---	---	---	54.7	22.8	.6	.3	.6	.1	103.3
Pastel green	14.1	10.0	0.1	---	---	0.05	54.7	22.8	.6	.3	.6	.1	103.3
Bulkhead gray	13.5	10.0	.4	.1	.3	---	54.7	22.8	.6	.3	.6	.1	103.4
Green gray	13.9	10.0	.2	.03	.08	---	54.7	22.8	.6	.3	.6	.1	103.3
Yellow gray	13.8	10.0	.3	.07	.03	---	54.7	22.8	.6	.3	.6	.1	103.3
Pearl gray	14.2	10.0	.04	---	.09	---	54.7	22.8	.6	.3	.6	.1	103.4
Pastel blue	14.2	10.0	---	0.02	.05	0.06	54.7	22.8	.6	.3	.6	.1	103.4

[1] Use of volume units must be consistent; that is, either all liters or all gallons.

6.6 Tinting colors. Type V enamel may be tinted to the colors of the other types with tinting colors in accordance with DOD-C-22325 in the rates of one volume (1/2 pint) of tinting color to 16 volumes (1 gallon) of white.

6.7 Cross reference. Nonflaming enamel (dry), chlorinated alkyd resin, semigloss, covered in this specification corresponds to those covered in the superseded specifications, as follows:

DOD-E-24607	Superseded specifications
Beach-sand	MIL-E-17136B(SHIPS)
Rose-wood	MIL-E-17325A(SHIPS)
Clipper blue	MIL-E-17326A(SHIPS)
Sun glow	MIL-E-17466A(SHIPS)
Soft white	MIL-E-17970C
Pastel green	MIL-E-17971C
Bulkhead gray	MIL-E-17972C
Green gray	MIL-P-17973A(SHIPS)
Yellow gray	MIL-P-17974A(SHIPS)
Pearl gray	Not covered
Pastel blue	Not covered

6.8 Material safety data sheets. Contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets (MSDS) prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in appendix B of FED-STD-313. In order to obtain the MSDS, FAR clause 52.223-3 must be in the contract.

6.9 Subject term (key word) listing.

Antisettling agent
Antiskinning agent
Barium sulfate
Chlorinated alkyd resin
Color
Enamel
Interior
Nonflaming
Paint thinner
Semigloss
Tinting pigment
Titanium dioxide

6.10 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:
Army - ME
Navy - SH
Air Force - 99

Review activity:
Army - MR, ME
Navy - YD

User activities:
Navy - MC, OS, CG

Preparing activity:
Navy - SH
(Project 8010-1182)

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
DOD-E-24607A	ENAMEL, INTERIOR, NONFLAMING (DRY), CHLORINATED ALKYD RESIN, SEMIGLOSS (METRIC)

3a. NAME OF SUBMITTING ORGANIZATION

b. ADDRESS *(Street, City, State, ZIP Code)*

4. TYPE OF ORGANIZATION *(Mark one)*

- ☐ VENDOR
- ☐ USER
- ☐ 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
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