

TT-E-508C  
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SUPERSEDING  
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## FEDERAL SPECIFICATION

### ENAMEL, INTERIOR, SEMIGLOSS, TINTS AND WHITE

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

#### 1. SCOPE

1.1 Scope. This specification covers two types of a ready-mixed high-grade synthetic semigloss enamel, in white and tints, suitable for general interior use on walls, ceilings, and woodwork.

1.2 Classification. The paint shall be of the following types.

- Type I - Tints (pastel) and whites (colors 27875 and 27778) specified by reference to Fed. Std. No. 595.
- Type II - A high-hiding white (no color number), suitable for use as is or as a tint-base (see 3.3.13 and 6.6).

#### 2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issues in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

##### Federal Specifications:

- TT-R-266 - Resin, Alkyd Solutions.
- TT-T-291 - Thinner-paint, Volatile Spirits Petroleum Spirits.
- PPP-P-1892 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing, and Marking Of.

##### Federal Standards:

- Fed. Test Method Std. No. 141 - Paint, Varnish, Lacquer and Related Materials; Methods of Inspection, Sampling, and Testing.
- Fed. Std. No. 595 - Colors.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other Federal Specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

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## Military Standard:

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

(Copies of Military Specifications and Standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

## American Society for Testing and Materials (ASTM) Standards.

- D 185 - Coarse Particles in Pigments, Pastes, and Paints.
- D 476 - Titanium Dioxide Pigments.
- D 562 - Consistency of Paints Using The Stormer Viscosimeter.
- D 563 - Phthalic Anhydride Content of Alkyd Resins and Resin Solutions.
- D 1210 - Fineness of Dispersion of Pigment Vehicle Systems.
- D 1296 - Odor of Volatile Solvents and Diluents.
- D 1308 - Effert of Household Chemicals on Clear and Pigmented Organic Finishes.
- D 1542 - Qualitative Tests for Rosin in Varnishes.
- D 3272 - Vacuum Distillation of Solvents from Solvent-Based Paints for Analysis.
- E 97 - 45 deg., 0 deg. Directional Reflectance of Opaque Specimens by Filter Photometry.

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

## 3. REQUIREMENTS

3.1 Material. The enamel as received shall he ready mixed, consisting of pigment or pigments and vehicle specified, so combined as to produce an enamel meeting all the requirements of this specification.

## 3.2 Composition.

3.2.1 Pigments. The prime pigment shall consist of titanium dioxide conforming to ASTM D 476, types III or IV. Zinc oxide is permitted at the discretion of the supplier, provided the enamel complies with all requirements of the specification. Tinting pigments may be used when necessary to match the color required, provided the enamel complies with all requirements of the specification.

3.2.2 Vehicle. The vehicle shall consist of alkyd resin solutions conforming to TT-R-266, type I, either with thinner conforming to TT-T-291, type II, grade A or with any solvent system conforming to 3.2.3. Driers, wetting agents, coalescing agents, or suspension agents may be used at the discretion of the supplier.

3.2.3 Solvent. The solvent, when tested as specified in 4.3.14, shall conform by volume to the requirements controlling the emission of solvents into the atmosphere as called out in (a) through (g).

- (a) A combination of aldehydes or branched-chain ketones: 20 percent

maximum.

- (b) A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene: 8 percent maximum.
- (c) A combination of ethylbenzene or toluene: 20 percent maximum.
- (d) A combination of solvents with olefinic or cyclo-olefinic unsaturation: 5 percent maximum.
- (e) Total of (a) + (b) + (c) + (d) = 20 percent maximum.
- (f) Benzene: 0.4 percent maximum.
- (g) Halogenated compounds: Zero.

### 3.3 Qualitative requirements.

3.3.1 Condition in container. The enamel, when tested as in 4.3.2, shall be free of grit, seeds, skins, lumps, and livering, and shall show no more pigment settling or caking than can readily be reincorporated into a smooth homogenous state.

#### 3.3.2 Storage stability.

3.3.2.1 Partially full container. The enamel shall show no skinning when tested as in 4.3.3. After storage as specified in 4.3.3.1, the enamel shall show no livering, skinning, seeding, curdling, hard caking, or gummy sediment. It shall mix readily to a smooth homogeneous state.

3.3.2.2 Full container. The enamel shall show no skinning, livering, seeding, curdling, hard and dry caking, or tough, gummy sediment when tested as in 4.3.3.2. After storage for 12 months as specified in 4.3.3.2, the enamel shall remix readily to a smooth homogenous state. There shall be no change in drying time, and the viscosity shall be between 72 and 92 K.U.

3.3.3 Dilution stability. When thinned as in 4.3.4, the enamel shall remain stable and uniform, showing no precipitation, curdling, or separation. Any settling that can easily be redispersed to a homogeneous state by light stirring shall be permitted.

3.3.4 Brushing properties. The enamel, when tested as in 4.3.5, shall brush satisfactorily in all respects, and shall dry to a smooth, glossy uniform film free from seeds, runs, and streaks. The dried film shall be free of brush marks and other irregularities.

3.3.5 Spraying properties. The enamel, when tested as in 4.3.6, shall show no running, sagging, streaking, or pronounced orange peel. The air dried film shall show no seeding, dusting, floating, flatting, mottling, hazing, or other film defects.

3.3.6 Odor. When tested as in 4.3.7, the odor of the wet enamel and of the film at any interval of drying shall not be obnoxious or objectionable. There shall be no strong odor after 72 hours of drying.

3.3.7 Flexibility. A film of the enamel, prepared and tested as in 4.3.8, shall withstand bending without cracking or flaking.

3.3.8 Knife test. A film of enamel, prepared and tested as in 4.3.9, shall adhere tightly to and shall not flake or crack from the metal. The film ribbon shall curl when cut from the metal, and the cut shall show beveled edges.

3.3.9 Recoating properties. When tested as in 4.3.10, recoating of a dried film shall produce no flashing, lifting, mottling, orange peeling, spotting, wrinkling, or other film irregularities.

3.3.10 Sag resistance. The enamel shall have a minimum anti-sag index of 7.0 when tested using the Leneta anti-sag meter (0.003 - 0.012 in) as specified in 4.3.11.

3.3.11 Water resistance. A film of the enamel prepared and tested as in 4.3.13 shall show no blistering or wrinkling when examined immediately after removal from distilled water. When examined 2 hours after removal, there shall be no softening or dulling. After 24 hours air drying, the portion of the panel which was immersed shall be the same with regard to hardness,

adhesion, and general appearance of the unimmersed portion, and it shall retain at least 90 percent of the 60 deg. specular gloss of the comparison portion.

3.3.12 Leveling properties. The enamel shall have a minimum leveling index of 5 when tested as in 4.3.12.

3.3.13 Color. The color of all type I paint specified in the contract or order (see 6.2) shall match that of the standard color chip in Fed. Std. No. 595 when tested as specified in 4.4.3. Type II (tint-base) shall meet the directional reflectance specified in table I when tested as specified in table IV.

3.3.14 Compatibility (type II only). When tested as specified in 4.3.16, the dried film shall show uniform color, a 60 deg. gloss between 40 and 70, and no streaks, craters, or pigment floating.

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3.4 Quantitative requirements. The quantitative requirements shall be as specified in table I and 3.5 (see table II).

TABLE I. Quantitative requirements

Characteristics	Requirements	
	Minimum	Maximum
Pigment, Percent by weight of enamel	46	50
Pigment volume, percent of pigment in total nonvolatile	37	42
Titanium dioxide pigment, (86 percent rutile, $TiO_{2\gamma}$ ), pounds per gallon	2.5 (see 3.5)	----
Nonvolatile vehicle, percent by weight of vehicle	45	----
Phthalic anhydride, percent by weight of nonvolatile vehicle	23	----
Rosin and derivatives	----	0
Water content, percent by weight of enamel	----	0.5
Coarse particles and skins, residue retained on #325 sieve, percent by weight of enamel	----	0.1
Consistency, Krebs-Stormer, Shearing rate, 200 RPM:		
Grams	175	250
Equivalent K.U.	77	89
Drying time of enamel:		
Set touch (hours)	1/3	2
Dry hard (hours)	----	18
Directional reflectance, type II only	90	----
60-Degree specular gloss:		
After 48 hours air drying	40	70
After 168 hours air drying	40	----
Fineness of grind	6	----
Absorption, mm	----	3.2
Washability characteristics after tests:		
Reflectance, percent of that measured prior to washing	98	----
Gloss, percent of that measured prior to washing	70	----
Yellowness index difference (after accelerated yellowing), (type I, reflectance 80 percent and over only; and type II)	----	0.10
Lead, percent by weight of total non-volatile	----	0.06

3.5 Dry opacity (contrast ratio). When tested as specified in table IV, not more than 7.0 ml per square foot (540 square feet per gallon) of enamel shall be required to give the contrast ratio specified in table II.

TABLE II. Minimum dry film contrast ratio

Reflectance of enamel, percent	Contrast Ratio, Minimum
82 and above	0.95
76 - 81	0.96
72 - 75	0.97
68 - 71	0.98
61 - 67	0.99
60 and lower	1.00

Reflectances below 60 are not contemplated under this specification. However, if a need for such a tint should arise, the minimum  $TiO_{2\gamma}$  content requirement may be decreased to obtain those colors whose reflectances are below 60, provided the contrast ratio of the resulting color is 1.00.

#### 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 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 that supplies and services conform to prescribed requirements.



## 4.2 Sampling and inspection.

4.2.1 Inspection of preparation for delivery. The packaging, packing, and marking shall be inspected in accordance with the of PPP-P-1892.

### 4.2.2 Testing of the end item.

4.2.2.1 Lot. The paint shall be assembled into lots as specified in MIL-STD-105. In MIL-STD-105 the words "essentially the same conditions" shall be interpreted to mean a manufacturer's batch, which is defined as the end product of all raw materials mixed, blended, or processed in a single operation.

4.2.2.2 Sampling of the end item for tests. For the purposes of sampling, the lot shall be expressed in units of gallons. Samples from lots shall be taken in accordance with MIL-STD-105 using inspection level S-2 and an acceptable quality level (AQL) of 2.5.

4.2.2.3 Certificate of compliance. The contractor shall submit a certificate of compliance indicating that the paint complies with the storage stability requirement specified in 3.3.2.2. The government reserves the right to test the paint to determine the validity of the certificate.

4.3 Test methods. All tests shall be conducted in accordance with the methods specified in table IV to determine compliance with the requirements of section 3. Unless otherwise specified, all tests shall be conducted at standard conditions which are 23 +/- 1 deg. C (73 +/- 2 deg. F) and a relative humidity of 50 +/- 5 percent. All test reports shall contain the individual values utilized in expressing the final result. Failure to pass any test, or noncompliance with any requirement shall be cause for rejection of the sample.

TABLE IV. Index

Characteristics	Requirement Reference	Applicable Test		
		Fed. Test Method Std. No. 141	ASTM	Para. Ref.
Lightfastness of pigments	3.2.1	4561	-----	-----
Solvent	3.2.3	7356	D 3272	4.3.14
Condition in container	3.3.1	3011	-----	4.3.2
Storage stability	3.3.2	----	-----	4.3.3
Partially full container	3.3.2.1	3021	-----	4.3.3.1
Full container	3.3.2.2	3022	-----	4.3.3.2
Dilution stability	3.3.3	4203	-----	4.3.4
Brushing property	3.3.4	4321	-----	4.3.5
Spraying property	3.3.5	4331	-----	4.3.6
Odor	3.3.6	----	D 1296	4.3.7
Flexibility	3.3.7	6221	-----	4.3.8
Knife test	3.3.8	6304	-----	4.3.9
Recoating property	3.3.9	----	-----	4.3.10
Sag resistance	3.3.10	----	-----	4.3.11
Water resistance	3.3.11	----	D 1308 (sec. 5D)	4.3.13
Level property	3.3.12	----	-----	4.3.12
Color	3.3.13	4250	-----	4.3.1
Compatibility (type II only)	3.3.14	----	-----	4.3.16
Dry opacity - tints	3.5	4121	-----	-----

Pigment	Table I	----	D 476	-----
Pigment volume	Table I	4311	-----	-----
Nonvolatile vehicle	Table I	4053	-----	-----
Rosin and derivatives	Table I	----	D 1542	-----
Phthalic anhydride	Table I	----	D 563	-----
Coarse particles	Table I	----	D 185	-----
Absorption	Table I	4421	-----	-----
Water content	Table I	4081	-----	-----
Consistency	Table I	----	D 562	-----
Drying time	Table I	4061	-----	-----
Fineness of grind	Table I	----	D 1210	-----
Gloss	Table I	6101	-----	-----
Directional reflectance	Table I	----	E 97	-----
Washability	Table I	6141	-----	-----
Yellowness	Table I	6132	-----	-----
Lead	Table I	----	-----	4.3.15

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4.3.1 Color. Draw down a 76  $\mu\text{m}$  (0.003 in) dry-film of the enamel on a white carrara glass panel or a sealed chart, and allow to dry for 48 hours at standard conditions. Then determine the color in accordance with method 4250 of Fed. Test Method Std. No. 141, and evaluate for compliance with 3.3.13.

4.3.2 Condition in container. Determine the package condition of the enamel in accordance with method 3011 of Fed. Test Method Std. No. 141, and evaluate for compliance with 3.3.1. Reseal and then agitate the can for 3 minutes on a paint shaker. On re-examination of the contents, the disclosure of gel bodies, undispersed pigment, or unsatisfactory settling properties shall be cause for rejection.

4.3.3 Storage stability.

4.3.3.1 Partially full container. Determine skinning after 48 hours in accordance with method 3021 of Fed. Test Method Std. No. 141, except use a 3/4-filled 1/2-pint, multiple friction-top can. Reseal and store for 7 days at 60 deg. C, (140 deg. F), and evaluate for compliance with 3.3.2.1.

4.3.3.2 Full container. In accordance with method 3022 of Fed. Test Method Std. No. 141, allow a full quart can of the enamel to stand undisturbed for 12 months, and then examine the contents. Evaluate pigment settling or caking but agitate the can for 5 minutes on the paint shaker prior to re-examination. Make other applicable tests for compliance with 3.3.2.2.

4.3.4 Dilution stability. Reduce one part by volume of enamel as packaged with one part by volume of thinner conforming to TT-T-291, type II, grade A. Then test in accordance with method 4230 of Fed. Test Method Std. No. 141, and evaluate for compliance with 3.3.3.

4.3.5 Brushing properties. Using the enamel as packaged, determine brushing properties in accordance with procedure 4.2 of method 4321 of Fed. Test Method Std. No. 141, and evaluate for compliance with 3.3.4. Immediately place the panel in a vertical position for air drying. After the film has dried, evaluate the characteristics of the enamel for compliance with 3.3.4.

4.3.6 Spraying properties. Reduce eight parts by volume of enamel with one part by volume of thinner conforming to TT-T-291, type II, grade A. Spray on a steel panel to a dry film thickness of 25  $\pm$  2  $\mu\text{m}$  (0.0010  $\pm$  0.0001 in), and evaluate the spraying properties in accordance with method 4331 of Fed. Test Method Std. No. 141 for compliance with 3.3.5.

4.3.7 Odor. Test for odor in accordance with ASTM method D 1296 of Fed. Test Method Std. No. 141, and evaluate for compliance with 3.3.6.

4.3.8 Flexibility. Determine flexibility in accordance with method 6221 of Fed. Test Method Std. No. 141. Draw down a film of the enamel on a flat steel panel (see method 2011 of Fed. Test Method Std. No. 141) with an applicator which produces a dry film 76  $\mu\text{m}$  (0.003 in) thick. Air-dry for 18 hours, bake for 5 hours at 105 deg.  $\pm$  2 deg. C, cool for 1/2 hour at standard conditions, and bend over a 3.2 mm (1/8 in) mandrel. Examine the coating for cracks over the area of the bend in a strong light at a 7-diameter magnification, and evaluate for compliance with 3.3.7.

4.3.9 Knife test. Perform the knife test in accordance with method 6304 of Fed. Test Method Std. No. 141. Cut the film from the flat portion of the panel used for the flexibility test (see 4.3.8), and evaluate the result

for compliance with 3.3.8.

4.3.10 Recoating. Prepare the enamel as in method 4061 of Fed. Test Method Std. No. 141. Air-dry for 24 hours under standard conditions. Apply a second coat perpendicular to the first coat, and then air-dry as before. Evaluate for compliance with 3.3.9.

4.3.11 Non-sagging properties. Mount a sealed Morest or Leneta test chart on the vacuum plate of an automatic film applicator. Set the Leneta Anti-Sag Meter (see 6.4) at the top of the test chart with the open side of the blade facing the operator. Place a suitable quantity of enamel directly in front of the blade, and draw down the enamel. The completed draw-down shall then be immediately removed from the Automatic Film Applicator and placed in a vertical position with the stripes horizontal, the thinnest stripe being at the top. Allow to dry in this position, and then determine the Anti-Sag Index as follows: The lowest (heaviest film thickness) stripe which does not touch the next lower stripe is the Index Stripe. Fractional values are obtained by adding to the index value a fractional value based on the degree to which the stripe below the index stripe has merged with the next stripe as follows:

Degree of merger	Add
Complete (intervening block is completely wetted)	0.0
Not complete, but definitely more than half	0.2
Approximately half	0.4
Appreciable, but definitely less than half	0.6
Slight, just touching	0.8

The anti-sag index shall be evaluated for compliance with 3.3.10.

4.3.12 Leveling properties. The panel shall be prepared by drawing a film of the enamel on clear polished plate glass with an NYPC Leveling Blade (see 6.5). Allow the film to dry in a horizontal position for 24 hours, and then determine the Leveling Index as follows:

	Index
All pairs open, none flowed together.	0
Pair A flowed to bust contact; Pairs B, C, D, E open.	1
Pair A flowed together; Pairs B, C, D, E open.	2
Pair A flowed together; Pair B flowed to contact; Pairs C, D, E open.	3
Pairs A and B flowed together; Pairs C, D, E open.	4
Pairs A and B flowed together; Pair C to just contact; Pairs D and E open.	5
Pairs A, B, and C flowed together; pairs D and E open.	6
Pairs A, B, and C flowed together; Pairs D to just contact; Pair E open.	7
Pairs A, B, C, and D flowed together; Pair E open.	8
Pairs A, B, C, and D flowed together; Pair E to just contact.	9
Pairs A, B, C, and D and E flowed together.	10

The leveling index shall be evaluated for compliance with 3.3.12.

4.3.13 Water resistance. Prepare a film of the enamel as specified in 4.3.8. Air-dry the enamel for 96 hours at standard conditions, then immerse about half of the panel in distilled water at 23 +/- 1 deg. C for 18 hours in accordance with ASTM D 1308, section 5D, except maintain the temperature of the liquid at 23 deg. C. At the end of the test period, remove and evaluate for compliance with 3.3.11.

4.3.14 Solvent analysis. The solvent from 100 ml of the enamel shall be extracted in accordance with ASTM method D 3272. The solvent composition shall then be determined in accordance with 4.3.14.1, method 7356 of Fed. Test Method Std. No. 141, 4.3.14.2, and 4.3.14.3 to determine compliance with the requirement of 3.2.3.

4.3.14.1 Aromatic and oxygenated solvents. The 1.8 m column shall be

installed and the operating conditions described in method 7356 shall be followed. About 3 ul of the isolated distillate shall be injected and the chromatogram scanned. The aliphatic solvents will emerge within 1 minute, and the complete chromatogram should develop in about 5 minutes. From the position of the peaks observed on the chromatogram, an internal standard that will be free of interference shall be selected, such as cyclopentanol or cyclohexanol. Six-tenths of a ml of internal standard shall be added to 3 ml of the distillate. The sample shall be analyzed according to the above procedure. Peaks emerging after 1 minute are aromatic

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solvents along with any oxygenated solvents that may be present. The percent of aromatic and oxygenated solvents shall be calculated as follows:

$$\text{percent aromatic and oxygenated solvents, v/v} = \frac{A \times B}{C \times D}$$

Where: A = percent of internal standard added (in this case, 20).

B = area of aromatic and oxygenated solvents.

C = Calibration factor for the internal standard. This factor is dependent on the internal standard used and on the performance of the chromatograph, and should be determined daily.

D = Area of the internal standard (in this case cyclopentanol or cyclohexanol).

4.3.14.2 Halogenated compounds. The presence of halogenated compounds shall be determined in accordance with method 5132 of Fed. Test Method Std. No. 141.

4.3.14.3 Benzene. When the solvent is tested in accordance with 4.3.14.1, a trace benzene peak of not more than 2 percent of the toluene peak will be allowed.

4.3.15 Lead content.

4.3.15.1 Sample preparation. Using a 0.006-inch film applicator and a mechanical applicator plate, duplicate drawdowns for each sample of well-mixed paint shall be made on a standard paint penetration chart and dried for 24 hours. The draw-down shall be at least 10 inches long on the sealed portion of the penetration chart. The drawdown shall be cut into discs of appropriate size to fit the sample holder of a fluorescence x-ray spectrometer.

4.3.15.2 procedure. Lead content shall be determined using an X-ray fluorescence spectrometer capable of determining lead content at a minimum level of 0.03 percent by weight of the total nonvolatile. The settings a wavelength dispersive fluorescence spectrometer shall be as follows:[1]

Element	Analytical Line	Angle	Crystal	Detection	Collimeter	X-ray tube (MO)	
Pb	L	33.93	LiF(200)	Flow S.C.	Fine	60Kv	45Ma
Pb (backgrd I)		33.00	LiF(200)	Flow S.C.	Fine	60Kv	45Ma
Pb (backgrd II)		35.50	LiF(200)	Flow S.C.	Fine	60Kv	45Ma
Mo	K	20.33	LiF(200)	Flow S.C.	Fine	60Kv	45Ma

Pulse height selection shall be used in all measurements, and counting time shall be 100 seconds. Place the sample disc in the wavelength dispersive unit. Measure the count rates of lead, lead background, and the Molybdenum Compton scattered background from the X-ray tube.

4.3.15.3 Calculation.

$$R = \frac{I_{\gamma\text{Pb}} - I_{\gamma\text{Pb}} (\text{Background I}) + I_{\gamma\text{Pb}} (\text{Background II})}{\quad}$$

R =

$$I \Gamma_{Mo}$$

where I equals gross intensity. These results shall be compared to those obtained using a 0.06 percent lead standard made up from the same type of paint sample, and evaluated for compliance with table I.

[1] Energy dispersive fluorescence spectrometers shall be set-up according to the manufacturer's manual.



4.3.16 Compatibility test (type II only). In a beaker containing approximately 100 g of type II paint, place 2.0 g of tinting medium concentrate conforming to TT-T-390, color 2a. Stir thoroughly until the tinting concentrate is evenly dispersed to form a homogeneous mixture. Allow the mixture to stand undisturbed for 5 minutes. On one clear plate-glass panel, prepared in accordance with method 2021 of Fed. Test Method Std. No. 141, brush a coat of the mixture to approximately 25  $\mu\text{m}$  (0.001 in) dry film thickness and allow to dry at room temperature in a vertical position for 24 hours. While brushing, observe for streaks and pigment separation. On another panel prepared in the same way, draw down a 51  $\mu\text{m}$  (0.002 in) wet film thickness of the mixture. While the paint is still wet, rub-up an area using the index finger in circular motion and continue for a minimum of 20 revolutions. Exert light pressure of the finger while rubbing so as not to rub off the film. Allow the paint film to dry at standard conditions for 24 hours. Examine the dried film, and compare the rubbed-up area against the unrubbed-up area against the unrubbed-up area. A difference in color or 60 deg. gloss (tested in accordance with method 6103 of Fed. Test Method Std. No. 141A) of the dried film between these areas shall constitute incompatibility. Evaluate for conformance with 3.3.14.

## 5. PREPARATION FOR DELIVERY

5.1 Packaging, packing and marking. When specified, the enamel shall be packaged, packed, and marked in accordance with PPP-P-1892. Unless otherwise specified, commercial packaging and packing shall be used (see 6.2). The enamel shall be furnished in 1-quart metal cans, 1-gallon metal cans, 5-gallon metal pails, or 55-gallon steel drums as specified (see 6.2).

5.1.1 Precautionary markings. In addition to the markings required by PPP-P-1892, all individual containers should have the following marking:

"CAUTION: Adequate precautions should be taken when spraying."

## 5.2 Special marking.

5.2.1 Direction for use. The directions for use, which shall be clearly legible, shall be shown on the reverse side of the container and shall read as follows:

"This enamel is a top coat for properly primed walls and ceilings of plaster, wallboard, and similar surfaces, as well as for wood trim and metal (pretreated or otherwise prepared for painting). Previously unpainted but thoroughly dry plaster or wallboard should be given a coat of primer-coating conforming to TT-P-650, and this should be followed by one coat of enamel undercoat conforming to TT-E-543, then followed by this semi-gloss enamel, allowing 24 hours drying time between coats. New wood and metal surfaces may be primed. Semigloss enamel (TT-E-508) may be used, if preferred, as the intermediate coat on three-coat jobs. If semigloss enamel (TT-E-508) is used, thin with 1 pint of mineral spirits conforming to TT-T-291, type II, grade A, per gallon of enamel. Follow with one or, if specified, two coats of the enamel as received. Previously painted surfaces will require various modifications of these directions depending on the condition of the surface. For example, on woodwork and walls which have a medium to high gloss, the enamel may usually be applied directly, after suitable cleaning. Walls painted with flat paint should be treated the same as unpainted walls. The spreading rate of the enamel is about 400 square feet per gallon per coat."

5.2.2 The manufacturer shall include specific directions for spray application.

## 6. NOTES

6.1 Intended use. The enamel covered by this specification is intended for general interior use on dry walls, plaster, masonry, ceilings, woodwork, and metal surfaces. The enamel is characterized for easy brushing, excellent color retention, good drying, water resistance, and excellent flexibility. It may be used as a decorative coating on properly primed walls and ceilings of plaster, wallboard, and similar surfaces, as well as on wood trim and metal (pretreated or otherwise prepared for painting) surface.

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6.2 Ordering data. Purchasers should select the preferred options permitted herein, and include the following information in procurement documents:

- (a) Title, number, and date of this specification.
- (b) Type required (see 1.2).
- (c) Color required (see 3.3.13).
- (d) Size of container required (see 5.1).
- (e) Levels of packaging and packing required (see 5.1).

6.3 Surfaces coated with the enamel covered by this specification have a high degree of washability after the film has thoroughly dried and hardened. Mild white soap or mild alkaline, synthetic-type detergents and water will remove many types of soil.

6.4 The Leneta Anti-Sag Meter may be purchased from the Gardner Laboratory, Inc., Bethesda, MD 20014.

6.5 This blade is manufactured by Precision Gauge, Dayton, OH and can also be procured from Gardner Laboratory, Inc., Bethesda, MD 20014.

6.6 The type II tint-base white enamel is a high-hiding white enamel which can be tinted to the desired light color before application. This paint can also be used directly as a regular white enamel.

## MILITARY CUSTODIANS:

## CIVIL AGENCIES COORDINATING ACTIVITIES:

Navy - YD  
Air Force - 84

Commerce - NBS  
DOT - CG, RDS  
D.C. GOV'T - DGS  
GSA - FSS, PBO  
HEW - NIH  
HUD - HHE  
INTERIOR - BOR  
POSTAL - POS

## Review Activities:

Army - CE, MR

## User Activities:

Army - MD  
Navy - SH

## Military Coordinating Activity:

PREPARING ACTIVITY: GSA - FSS

Naval Facilities Engineering Command - YD

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Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See Section 2 of this specification to obtain extra copies and other documents referenced herein. Price 35 each.

TT-E-508C  
AMENDMENT-1  
July 17, 1984

FEDERAL SPECIFICATION

ENAMEL, INTERIOR (SEMI-GLOSS, TINTS AND WHITE)

This amendment, which forms a part of Federal Specification TT-E-508C, dated June 15, 1977, was approved by the Assistant Administrator, Office of Federal Supply and Services, General Services Administration, for the use of all Federal agencies.

PAGE 2

Para 2.2, under American Society for Testing and Materials (ASTM) Standards.  
Add:

- D 523 - Specular Gloss
- D 1729 - Visual Evaluation of Color Differences of Opaque Materials
- D 1849 - Package Stability of Paints
- D 2698 - Pigment Content of Solvent Type Paints by High-Speed Centrifuging
- D 2801 - Leveling Characteristics of Paints by Draw-Down Method
- D 2805 - Hiding Power of Paint
- D 3335 - Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy

Para 3.2.3 (f). Change to read: "Benzene: Zero."

PAGE 3

Para 3.3.2.1, line 3. Delete: "skinning".

Para 3.3.10, line 3. Change "4.3.11" to "table IV".

Para 3.3.12, line 2. Change "4.3.12" to "table IV".

Para 3.3.13, line 3. Change "4.4.3" to "4.3.1".

PAGE 5

TABLE IV, line 6, Full container. Delete "3022". Add "D 1849" under ASTM.

line 14, Sag resistance. Add "4494" under FTMS 141. Delete "4.3.11" under Para. Ref.

line 17, Level property. Add "D 2801" under ASTM. Delete "4.3.12" under Para. Ref.

line 18, Color. Delete "4250". Add "D 1729" under ASTM.

line 21, Dry capacity. Delete "4121". Add "D 2805" under ASTM.

line 24, Nonvolatile vehicle. Delete "4053". Add "D 2698" under ASTM.

line 33, Gloss. Delete "6101". Add "D 523" under ASTM. Add "4.3.17" under Para. Ref.

Add: "Pigment percent by weight" under Characteristics, "Table I" under Requirement Reference, and "D 2698" under ASTM.

PAGE 6

Para 4.3.1, second sentence. Change to read: "Recoat and dry as above if necessary to obtain complete hiding; compare the dried film with the specified color chip in accordance with ASTM D 1729."

Para 4.3.3.2, lines 1 and 2. Change "method 3022 of Fed. Test Method Std. No. 141" to "ASTM D 1849".

Para 4.3.4, line 3. Change "4230" to "4203".

PAGE 7

Para 4.3.11. Delete the paragraph in its entirety.

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PAGE 7

Para 4.3.12. Delete the paragraph in its entirety.

PAGE 8

Para 4.3.14.3. Change to read: "When the solvent is tested in accordance with 4.3.14.1, a benzene peak shall not be present."

Para 4.3.15. Change to read: "Determine lead content in accordance with ASTM D 3335 or as specified below. In case of dispute, the following procedure shall be used."

PAGE 9

Para 4.3.16, lines 16 and 17. Change "method 6103 of Fed. Test Method Std. No. 141A" to "ASTM D 523".

Add new paragraph 4.3.17:

"4.3.17 Gloss. Draw down the thoroughly mixed enamel on plane, opaque, white glass panels specified in 2.1.5 of method 2021 of Fed. Test Method Std. No. 141. Use a film applicator which will produce a wet film thickness of 76 +/- 2 un (0.003 +/- 0.0001 inch). Determine 60 deg. gloss in accordance with ASTM D 523 after 48 hours and 168 hours drying at standard conditions in a dust-free environment."

MILITARY INTERESTS:

CIVIL AGENCY COORDINATING ACTIVITIES

Military Coordinating Activity

COMMERCE - NBS

VA - OSS

Navy - YD

HHS-NIH

GSA - FSS

Custodians

PREPARING ACTIVITY:

Navy - YD

Air Force - 99

GSA - FSS

Review Activity

Army - CE, MD

Navy - SH