

METRIC

MIL-DTL-24441/35B(SH)

27 August 2009

SUPERSEDING

MIL-DTL-24441/35A(SH)

19 May 1999

DETAIL SPECIFICATION SHEET

PAINT, EPOXY-POLYAMIDE, RED, FORMULA 156, TYPE IV

This specification is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-DTL-24441.

FORMULA: This formula covers red epoxy-polyamide paint designated Navy Formula 156, Type IV for interior or exterior use. The paint shall consist of the ingredients specified in the quantities specified.

Component A<sup>14/</sup>

<b>Ingredients</b>	<b>Kilograms</b>	<b>Pounds</b>
Thixatrop <sup>1/</sup>	---	---
Polyamide <sup>2/</sup>	16.33	36.0
Polyamide adduct <sup>3/</sup>	165.56	365.0
Titanium dioxide <sup>4/</sup>	45.36	100.0
Magnesium silicate <sup>5/</sup>	90.72	200.0
Butyl alcohol <sup>6/</sup>	117.03	258.0
Yellow iron oxide <sup>8/</sup>	22.68	50.0
Red iron oxide <sup>7/</sup>	136.08	300.0

Component B<sup>14/</sup>

<b>Ingredients</b>	<b>Kilograms</b>	<b>Pounds</b>
Thixatrop <sup>9/</sup>	---	---
Epoxy resin <sup>10/</sup>	265.81	586.0
Magnesium silicate <sup>5/</sup>	90.72	200.0
Naphtha <sup>11/</sup>	97.52	215.0
Aluminum silicate <sup>12/</sup>	68.04	150.0

See footnotes on last page.

QUANTITATIVE REQUIREMENTS: The paint shall meet the following quantitative requirements and the qualitative requirements of section 3 of the general specification. The components A and B shall be mixed 1:1 by volume for mixed component tests. Tests shall be performed in accordance with the general specification.

Requirements	Component A		Component B		Mixed components	
	Min	Max	Min	Max	Min	Max
Pigment content, percent (%)	48.0	54.0	28.0	33.0	---	---
Volatiles, %	24.0	29.0	17.0	22.0	---	---
Nonvolatile vehicle, %	17.5	23.5	48.0	53.0	---	---
Water, %	---	1.5	---	0.5	---	---
Coarse particles, %	---	0.3	---	0.3	---	---
Consistency, grams	---	310	---	410	---	---
Kilograms per liter (kg/L) (pounds per gallon (lb/gal))	1.43 (11.9)	1.58 (13.2)	1.26 (10.5)	1.38 (11.5)	---	---
Set to touch, hours						
a. at 4.4 °C (40 °F)	---	---	---	---	---	3
b. at 23 °C (73 °F)	---	---	---	---	---	3
Dry-hard, hours						
a. at 4.4 °C (40 °F)	---	---	---	---	---	24
b. at 23 °C (73 °F)	---	---	---	---	---	8
Fineness of grind, NS	4	---	4	---	---	---
Flash point, °C (°F)	35.6 (96)	---	37.8 (100)	---	35.6 (96)	---
Titanium dioxide, % of pigment	13	---	---	---	---	---
Pot life, hours at 23 °C (73 °F)	---	---	---	---	4	---
Sag resistance, micrometers (mils)	---	---	---	---	300 (12)	---
Color of dry film to approximate the standard color chip	---	---	---	---	Conform	
Weight per epoxy vehicle	---	---	175	195	---	---
Contrast ratio, 3-mil dry film thickness	---	---	---	---	0.98	---
Gloss, 60 degree specular, %	---	---	---	---	---	25
VOC, grams per liter (g/L) (lb/gal)	---	---	---	---	---	340 (2.8)

See footnotes on next page.

- <sup>1/</sup> Thixatropes to be used is the manufacturer's choice. In the development of component A, 6.80 kilograms (15 pounds) (7.95 liters (2.1 gallons)) of Disparlon NS-30 made by King Industries were used. Manufacturer is responsible for choosing a thixatropes that meets all the requirements herein, including shelf life. Thixatropes is a pigment for calculation purposes.
- <sup>2/</sup> GENAMID 2000, Cognis Corp.; ANCAMIDE 507, Air Products Chemical Corp.; EPOTUF SF7791, REICHHOLD Chemical.
- <sup>3/</sup> Aradur 283, Huntsman Advanced Materials.
- <sup>4/</sup> Titanium dioxide conforming to ASTM D476, Type IV. In the development of component A, DuPont Tioxide R960 was used.
- <sup>5/</sup> Nicron 503, Luzenac, Inc.
- <sup>6/</sup> Butyl alcohol conforming to ASTM D304.
- <sup>7/</sup> Red Iron Oxide RO-6097 or RO4097, Elementis Pigments.
- <sup>8/</sup> Yellow Iron Oxide YO-3587, Elementis Pigments; Yellow Iron Oxide YLO3288D, Rockwood Pigments.
- <sup>9/</sup> Thixatropes to be used is the manufacturer's choice. In the development of component B, 6.80 kilograms (15 pounds) (6.81 liters (1.8 gallons)) of Disparlon 6500 made by King Industries were used. Manufacturer is responsible for choosing a thixatropes that meets all the requirements herein, including shelf life. Thixatropes is a pigment for calculation purposes.
- <sup>10/</sup> EPON 828, Hexion Chemical Co.; ARALDITE 6010, Huntsman Advanced Materials; DER 331, Dow Chemical Corp.; EPO-TUF 37-140, REICHHOLD Chemical Corp.
- <sup>11/</sup> Conforming to ASTM D3734, Type I. In the development of component B, AMSCO Super High Flash Naphtha was used.
- <sup>12/</sup> Huber 70C, J.M. Huber Corp.; Satintone #1, Englehard Mineral and Chemical Co.
- <sup>13/</sup> Use FED-STD-595 color chip number 20152. Color shall approximately match the color chip.
- <sup>14/</sup> For VOC calculations, component A makes approximately 383 liters (101 gallons) and component B makes approximately 386 liters (102 gallons).

Use of alternate ingredients in this formula must have prior approval of the Naval Sea Systems Command. Approval will be based on review of data demonstrating equivalent physical, chemical and performance characteristics of paint manufactured with the proposed alternate material and the requirements as specified in 3.4.1 of MIL-DTL-24441. Paint incorporating the proposed alternate ingredient shall conform to all the requirements of this military specification sheet and the general specification.

**CHANGES FROM PREVIOUS ISSUE:** Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Preparing Activity  
Navy – SH  
(Project 8010-2009-019)

**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 <http://assist.daps.dla.mil>.