

METRIC

MIL-DTL-24441/35A(SH)

19 May 1999

SUPERSEDING

MIL-P-24441/35(SH)

23 July 1991

## 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 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>

Ingredients	Kilograms	Pounds
Thixatropo <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
Red iron oxide <sup>7/</sup>	136.08	300.0
Yellow iron oxide <sup>8/</sup>	22.68	50.0

COMPONENT B <sup>14/</sup>

Ingredients	Kilograms	Pounds
Thixatropo <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.

AMSC N/A

FSC 8010

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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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	225	310	260	410	---	---
Kilograms per liter (kg/L) [pounds per gallon (lb/gal)]	1.43 (11.9)	1.49 (12.0)	1.26 (10.5)	1.32 (11.0)	---	---
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)	35.5 (96)	---	37.8 (100)	---	---	---
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 <sup>13/</sup>	---	---	---	---	Conform	
Weight per epoxy, vehicle	---	---	175	195	---	---
Contrast ratio, 75 μm (3-mil) dry film	---	---	---	---	0.98	---
Gloss, 60 degree specular, %	---	---	---	---	---	25
VOC, grams per liter (g/L) (lb/gal) <sup>14/</sup>	---	---	---	---	---	340 (2.8)

See footnotes on top of next page.

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- 1/ Thixatropo to be used is the manufacturer's choice. In the development of component A, 6.80 kg (15 pounds) [7.95 L (2.1 gallons)] of Dislon NS-30 made by King Industries was used. Manufacturer is responsible for choosing a thixatropo that meets all the requirements herein, including shelf life. Thixatropo is a pigment for calculation purposes.
- 2/ GENAMID 2000, Henkel Corp.; UNIREZ 2810, Union Camp; AZAMIDE 600, AZ Products; ANCAMINE 507, Pacific Anchor Chemical Corp.; EPOTUF SF7791, Reichold Chemical.
- 3/ Xu-Hy-283, Ciba-Geigy Corporation.
- 4/ Titanium dioxide conforming to ASTM D 476, type IV. In the development of component A, DuPont Tipure R960 was used.
- 5/ Mistron 400, "Mistron 500", Cyprus Industries.
- 6/ Conforming to ASTM D 304.
- 7/ Red Iron Oxide RO-6097, Charles Pfizer.
- 8/ Yellow Iron Oxide YO-3587, Charles Pfizer.
- 9/ Thixatropo to be used is the manufacturer's choice. In the development of component B, 6.80 kg (15 pounds) [6.81 L (1.8 gallons)] of Dislon 6500 made by King Industries were used. Manufacturer is responsible for choosing a thixatropo that meets all the requirements herein, including shelf life. Thixatropo is a pigment for calculation purposes.
- 10/ EPON 828, Shell Chemical Co.; ARALDITE 6010, Ciba-Geigy Corp.; DER 331, Dow Chemical Corp.; AZEPOXY 128, AZ Products; EPO-TUF 37-140, Reichold Chemical Corp.; Trichem 728, Trimont Chemicals; EPI-REZ 510, Celanese.
- 11/ Conforming to ASTM D 3734, type 1. In the development of component B, AMSCO Super High Flash Naphtha was used.
- 12/ Huber 70C, J. M. Huber Corp.; Satintone #1, Englehard Mineral and Chemical Co.
- 13/ Use FED-STD-595 color chip no. 20109. Color shall approximately match the color chip.
- 14/ For VOC calculations, component A makes approximately 383 L (101 gallons) and component B makes approximately 386 L (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 3.4.2 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-N022)

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1. DOCUMENT NUMBER  
MIL-DTL-24441/35A

2. DOCUMENT DATE (YYYYMMDD)  
1999/05/19

3. DOCUMENT TITLE

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

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*

b. ORGANIZATION

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d. TELEPHONE *(Include Area Code)*

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*(if applicable)*

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