

METRIC

MIL-DTL-24441/38A(SH)

19 May 1999

SUPERSEDING

MIL-P-24441/38(SH)

23 July 1991

DETAIL SPECIFICATION SHEET

PAINT, EPOXY-POLYAMIDE, BLACK, FORMULA 160, 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 black epoxy-polyamide paint designated Navy Formula 160, Type IV for interior or exterior use. The paint shall consist of the ingredients specified in the quantities specified.

COMPONENT A ^{11/}

| Ingredients | Kilograms | Pounds |
|--------------------------------|-----------|--------|
| Thixatropo ^{1/} | --- | --- |
| Polyamide ^{2/} | 13.61 | 30.0 |
| Polyamide adduct ^{3/} | 214.55 | 473.0 |
| Silica ^{4/} | 46.27 | 102.0 |
| Mineral spirits ^{5/} | 49.90 | 110.0 |
| Butyl alcohol ^{6/} | 47.17 | 104.0 |

COMPONENT B ^{11/}

| Ingredients | Kilograms | Pounds |
|--------------------------------|-----------|--------|
| Thixatropo ^{1/} | --- | --- |
| Silica ^{4/} | 321.60 | 709.0 |
| Epoxy resin ^{8/} | 28.12 | 62.0 |
| Black iron oxide ^{9/} | 57.15 | 126.0 |
| Naphtha ^{10/} | 66.68 | 147.0 |

See footnotes on next 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 and qualitative requirements of section 3 of the general specification. 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 (%) | 11.5 | 15.5 | 15.7 | 19.7 | --- | --- |
| Volatiles, % | 38.0 | 42.0 | 12.0 | 16.0 | --- | --- |
| Nonvolatile vehicle, % | 44.5 | 49.5 | 65.3 | 69.3 | --- | --- |
| Water, % | --- | 1.5 | --- | 0.5 | --- | --- |
| Course particles, % | --- | 0.3 | --- | 0.3 | --- | --- |
| Consistency, KU | 72 | 83 | 72 | 83 | --- | --- |
| Kilograms per liter (kg/L) [pounds per gallon (lb/gal)] | 0.95 (7.9) | 0.99 (8.3) | 1.22 (10.2) | 1.27 (10.6) | --- | --- |
| 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) | --- | --- | --- | --- | --- | 6 |
| Fineness of grind, NS | 3 | --- | 2 | --- | --- | --- |
| Flash point, °C (°F) | 35.5 (96) | --- | 37.8 (100) | --- | --- | --- |
| Pot life, hours at 23°C (73°F) | --- | --- | --- | --- | 6 | --- |
| Sag resistance, micrometers (mils) | --- | --- | --- | --- | 300 (12) | --- |
| Weight per epoxy, vehicle | --- | --- | 175 | 190 | --- | --- |
| Contrast ratio, 75 μm (3-mil) dry film | --- | --- | --- | --- | 0.98 | --- |
| VOC, grams per liter (g/L) (lb/gal) ^{13/} | --- | --- | --- | --- | --- | 340 (2.8) |

- 1/ Thixatropes to be used is the manufacturer's choice. In the development of component A, 4.54 kg (10 pounds) [5.3 L (1.4 gallons)] of Dislon NS-30 made by King Industries was used. Manufacturer is responsible for choosing a thixatropes that meets all the requirements herein, including shelf life. Thixatropes 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/ VERSAMID 280B75, Henkel Corp.; UNIREZ 2810, Union Camp; AZAMIDE 680B75, AZ Products; ANCAMINE 700B75, Pacific Anchor Chemical Corp.; EPOTUF SF7792, Reichold Chemical.
- 4/ Quso WR-55, PQ Corp.
- 5/ Conforming to TT-T-291, type III.
- 6/ Butyl alcohol conforming to ASTM D 304.
- 7/ Thixatropes to be used is the manufacturer's choice. In the development of component B, 4.54 kg (10 pounds) of Dislon 6500 made by King Industries were used. Manufacturer is responsible for choosing a thixatropes that meets all the requirements herein, including shelf life.

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- 8/ 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.
- 9/ Bayferrous Black Iron Oxide 318M, Mobay Chemical Corp.
- 10/ Conforming to ASTM D 3734, type 1. In the development of component B, AMSCO Super High Flash Naphtha was used.
- 11/ For VOC calculations, component A makes approximately 386 L (102 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-N106)

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I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
MIL-DTL-24441/38A

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

3. DOCUMENT TITLE

PAINT, EPOXY-POLYAMIDE, BLACK, FORMULA 160, 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

c. ADDRESS *(Include Zip Code)*

d. TELEPHONE *(Include Area Code)*

7. DATE SUBMITTED
(YYYYMMDD)

(1) Commercial
(2) DSN
(if applicable)

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