METRIC
MIL-DTL-24441/39A(SH)
19 May 1999
SUPERSEDING
MIL-P-24441/39(SH)
23 July 1991

DETAIL SPECIFICATION SHEET

PAINT, EPOXY-POLYAMIDE, YELLOW, FORMULA 161, 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 yellow epoxy-polyamide paint designated Navy Formula 161, 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
Thixatrope [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
Thixatrope [7/]	---	---
Silica [4/]	321.60	709.0
Epoxy resin [8/]	28.12	62.0
Yellow iron oxide [9/]	57.15	126.0
Naphtha [10/]	66.68	147.0

See footnotes on next page.

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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/ Thixatrope 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 thixatrope that meets all the requirements herein, including shelf life. Thixatrope 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/ Thixatrope 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 thixatrope that meets all the requirements herein, including shelf life.

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 Yellow Iron Oxide 3240, 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-N107)

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I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-DTL-24441/39A	2. DOCUMENT DATE *(YYYYMMDD)* 1999/05/19

3. DOCUMENT TITLE
PAINT, EPOXY-POLYAMIDE, YELLOW, FORMULA 161, 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)* (1) Commercial (2) DSN *(if applicable)*	7. DATE SUBMITTED *(YYYYMMDD)*

8. PREPARING ACTIVITY

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c. ADDRESS *(Include Zip Code)* Commander, Naval Sea Systems Command ATTN: SEA 03Q, 2531 Jefferson Davis Hwy Arlington, VA 22242-5160	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Standardization Program Office (DLSC-LM) 8725 John J. Kingman Road, Suite 2533, Fort Belvoir, VA 22060-6221 Telephone (703) 767-6888 DSN 427-6888