Protective & Marine Coatings

MIL-DTL-24441D, TYPE III
EPOXY POLYAMIDE

N10-350 Series

Revised: March 31, 2022

Product Information

9.32

Product Description

MIL-24441, TYPE III is an epoxy polyamide system, formulated for immersion service and to protect surfaces from environmental attack. For use where air pollution regulations for marine coatings are restricted to a maximum of 340 g/L or 2.8 lb/gal.

Product Characteristics

Finish: Low sheen

Colors:
Primer: 150 Green
Finishes: 151 Haze Gray, 152 White, 153 Dark Gray, 154 Dark Gray, 155 Dark Gray, 156 Matte Red

Volume Solids:

Primer:	
Formula 150 Green	59.2 ± 1%
Finish:	
Formula 151 Haze Gray	58.6 ± 1%
Formula 152 White	58.1 ± 1%
Formula 153 Dark Gray Ro 1.8	58.5 ± 1%
Formula 154 Dark Gray Ro 3.6	58.4 ± 1%
Formula 155 Dark Gray Ro 6	58.4 ± 1%
Formula 156 Matte Red	61.0 ± 1%

VOC (EPA Method 24): <340 g/l; 2.8 lb/gal, maximum, mixed

Mix Ratio: 1:1 by volume

Recommended Spreading Rate per coat:

	Primer Min.	Primer Max.	Topcoats Min.	Topcoats Max.
Wet mils (microns)	**5.0** 125	**6.0** 150	**3.5** 88	**5.0** 125
Dry mils (microns)	**3.0** 75	**4.0** 100	**2.0** 50	**3.0** 75
~Coverage sq ft/gal (m^2/L)	**236** 5.8	**315** 7.7	**310** 7.6	**464** 11.4
Theoretical coverage **sq ft/gal** (m^2/L) @ 1 mil/25 micron dft	**928** (22.7)			

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 5.0 mils wet (125 microns):

	35-40°F (1.6-4.5°C)	41-60°F (4.5-16°C)	61-80°F (16-27°C) *50% RH*	81-100°F (27-38°C)
Dry to touch:	12 hours	8 hours	6 hours	4 hours
To recoat:				
minimum (epoxy):	24 hours	18 hours	12 hours	8 hours
minimum (non-epoxy)*:	12 hours	8 hours	6 hours	4 hours
maximum:	14 days	12 days	10 days	7 days
Cure to service:	6 days	5 days	4 days	64 hours

*An anti-foulant topcoat must be applied before the previous epoxy topcoat has hardened and while the epoxy is in a slightly tacky condition. This overcoat period is mainly dependent on the existing environmental conditions. If the epoxy is not tacky, an additional coat of epoxy must be applied to provide the required tacky condition.

Pot Life: 5 hours at 77°F/25°C, 50% RH

Sweat-in-Time:
@ 35-60°F (1.6-16°C): 2 hours
@ 61-70°F (16-21°C): 1-1.5 hours
@ 71-90°F (21-32°C): 30 minutes - 1 hour
@ >90°F (>32°C): none

Product Characteristics (Cont'd)

Shelf Life:	36 months, unopened Store indoors at 40°F (4.5°C) to 100°F (38°C)
Flash Point:	100°F (38°C), PMCC, mixed
Reducer/Clean Up:	Reducer #130, R7K130

Recommended Uses

For use over prepared substrates such as steel and aluminum in industrial and marine environments where a hard, durable, chemical resistant coating is desired.

- Marine vessels: bilges, tanks, and underwater hulls

Complies with Military Specification MIL-DTL-24441D, Type III uses for Marine services.

For use where air pollution regulations for marine coatings are restricted to a maximum of 340 g/L or 2.8 lb/gal.

Performance Characteristics

Complies with Military Specification MIL-DTL-24441, Type III and is listed on NAVSEA QPL-24441

Color	Product/Rex Number
Primer:	
Green - 150, Part A	N10G350
Hardener for Primer 150, Part B	N10V350
Finishes:	
Haze Gray - 151, Part A	N10A351
White - 152, Part A	N10W352
Dark Gray - Ro 1.8 153, Part A	N10A353
Dark Gray - Ro 3.6 154, Part A	N10A354
Dark Gray Ro 6 155, Part A	N10A355
Hardener for 151-155, Part B	N10V351
Red - 156, Part A	N10R356
Hardener for 156, Part B	N10V356

continued on back

Protective & Marine Coatings

MIL-DTL-24441D, TYPE III
EPOXY POLYAMIDE

N10-350 Series

Revised: March 31, 2022

Product Information

9.32

Recommended Systems

		Dry Film Thickness / ct. Mils	(Microns)
Steel:			
1 ct.	MIL-24441, Type III Primer	3.0-4.0	(75-100)
2 cts.	MIL-24441, Type III Epoxy	2.0-3.0	(50-75)
Steel, non-immersion (exterior):			
1 ct.	MIL-24441, Type III Epoxy	3.0-4.0	(75-100)
2 cts.	MIL-PRF-24635	1.5-2.5	(40-63)
Steel:			
1 ct.	MIL-24441, Type III Primer (Formula 150 only)	2.0-4.0	(50-100)
1 ct.	MIL-24441, Type III (No. 156)	2.0-4.0	(50-100)
1 ct.	MIL-24441, Type III (No. 152)	2.0-4.0	(50-100)
Total system to be 8.0 mils (200 microns) minimum, 12.0 mils (300 microns) maximum.			
Aluminum:			
1 ct.	MIL-24441, Type III Primer (Formula 150 only)	3.0-4.0	(75-100)
2 cts.	MIL-24441, Type III Epoxy	2.0-3.0	(50-75)

The systems listed above are representative of the product's use, other systems may be appropriate.

Surface Preparation

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

Iron & Steel	
Atmospheric:	SSPC-SP6/NACE 3, 2.0 mil (50 micron) profile
Immersion:	SSPC-SP10/NACE 2, 1.0-3.0 mil (25-75 micron) profile
Aluminum	SSPC-SP7 or Power Wire Brush

Surface Preparation Standards

	Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal		Sa 3	Sa 3	SP 5	1
Near White Metal		Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast		Sa 2	Sa 2	SP 6	3
Brush-Off Blast		Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	Rusted	C St 2	C St 2	SP 2	-
	Pitted & Rusted	D St 2	D St 2	SP 2	-
Power Tool Cleaning	Rusted	C St 3	C St 3	SP 3	-
	Pitted & Rusted	D St 3	D St 3	SP 3	-

Tinting

Do not tint.

Application Conditions

Temperature:	
air and surface:	35°F (1.6°C) minimum, 100°F (38°C) maximum
material:	60°F (16°C) minimum At least 5°F (2.8°C) above dew point
Relative humidity:	85% maximum

Refer to product Application Bulletin for detailed application information.

Ordering Information

Packaging:	1 gallon (3.78L) and 5 gallon (18.9L) containers
~Weight:	~10.3 - 11.5 ± 0.2 lb/gal ; 1.2 - 1.4 Kg/L mixed, depending on color

Safety Precautions

Refer to the SDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

Warranty

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Disclaimer

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

Protective & Marine Coatings

MIL-DTL-24441D, TYPE III
EPOXY POLYAMIDE

N10-350 SERIES

Revised: March 31, 2022

APPLICATION BULLETIN

9.32

SURFACE PREPARATIONS

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Iron & Steel (immersion service)
Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Near White Metal Blast Cleaning per SSPC-SP10/NACE 2. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (1-3 mils / 25-75 microns). Remove all weld spatter and round all sharp edges. Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

Iron & Steel (atmospheric service)
Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Commercial Blast Cleaning per SSPC-SP6/NACE 3. For better performance, use Near White Metal Blast Cleaning per SSPC-SP10/NACE 2. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils / 50 microns). Remove all weld spatter and round all sharp edges by grinding. Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

Aluminum
Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Brush Off Blast Cleaning per SSPC-SP7.

Surface Preparation Standards

	Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal		Sa 3	Sa 3	SP 5	1
Near White Metal		Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast		Sa 2	Sa 2	SP 6	3
Brush-Off Blast		Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	Rusted	C St 2	C St 2	SP 2	-
	Pitted & Rusted	D St 2	D St 2	SP 2	-
Power Tool Cleaning	Rusted	C St 3	C St 3	SP 3	-
	Pitted & Rusted	D St 3	D St 3	SP 3	-

APPLICATION CONDITIONS

Temperature:	
air and surface:	35°F (1.6°C) minimum, 100°F (38°C) maximum
material:	60°F (16°C) minimum At least 5°F (2.8°C) above dew point
Relative humidity:	85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

Reducer/Clean Up ..... Reducer #130, R7K130

Airless Spray
Pump ..... 30:1 minimum
Hose ..... 3/8" ID
Tip ..... .015"
Filter ..... 30 mesh
Reduction ..... As needed up to 5% by volume

Conventional Spray
Gun ..... DeVilbiss MBC
Air Cap ..... 64°
Needle ..... D
Atomization Pressure ..... 70 psi
Fluid Pressure ..... 30 psi
Reduction ..... As needed up to 5% by volume

Brush
Brush ..... Natural Bristle
Reduction ..... Not recommended

Roller
Cover ..... 3/8" woven with solvent resistant core
Reduction ..... Not recommended

If specific application equipment is not listed above, equivalent equipment may be substituted.

continued on back

Protective & Marine Coatings

MIL-DTL-24441D, TYPE III
EPOXY POLYAMIDE

N10-350 Series

Revised: March 31, 2022

Application Bulletin

9.32

Application Procedures

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly with low speed power agitation. Make certain no pigment remains on the bottom of the can. Then combine one part by volume of Part A with one part by volume of Part B. Thoroughly agitate the mixture with power agitation. Allow the material to sweat-in as indicated below prior to application. Re-stir before using.

If reducer solvent is used, add only after both components have been thoroughly mixed, after sweat-in.

Apply paint at the recommended film thickness and spreading rate as indicated below:

Recommended Spreading Rate per coat:

	Primer		Topcoats	
	Min.	**Max.**	**Min.**	**Max.**
Wet mils (microns)	**5.0** 125	**6.0** 150	**3.5** 88	**5.0** 125
Dry mils (microns)	**3.0** 75	**4.0** 100	**2.0** 50	**3.0** 75
~Coverage sq ft/gal (m^2/L)	**236** 5.8	**315** 7.7	**310** 7.6	**464** 11.4
Theoretical coverage **sq ft/gal** (m^2/L) @ 1 mil/25 micron dft	**928** (22.7)			

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 5.0 mils wet (125 microns):

	35-40°F (1.6-4.5°C)	41-60°F (4.5-16°C)	61-80°F (16-27°C) *50% RH*	81-100°F (27-38°C)
Dry to touch:	12 hours	8 hours	6 hours	4 hours
To recoat:				
minimum (epoxy):	24 hours	18 hours	12 hours	8 hours
minimum (non-epoxy)*:	12 hours	8 hours	6 hours	4 hours
maximum:	14 days	12 days	10 days	7 days
Cure to service:	6 days	5 days	4 days	64 hours

*An anti-foulant topcoat must be applied before the previous epoxy topcoat has hardened and while the epoxy is in a slightly tacky condition. This overcoat period is mainly dependent on the existing environmental conditions. If the epoxy is not tacky, an additional coat of epoxy must be applied to provide the required tacky condition.

Pot Life: 5 hours at 77°F/25°C, 50% RH

Sweat-in-Time: @ 35-60°F (1.6-16°C): 2 hours
@ 61-70°F (16-21°C): 1-1.5 hours
@ 71-90°F (21-32°C): 30 minutes - 1 hour
@ >90°F (>32°C): none

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

Clean Up Instructions

Clean spills and spatters immediately with Reducer #130, R7K130. Clean tools immediately after use with Reducer #130, R7K130. Follow manufacturer's safety recommendations when using any solvent.

Disclaimer

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

Performance Tips

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Excessive reduction of material can affect film build, appearance, and adhesion.

Excessive film build, poor ventilation, and cool temperatures may cause solvent entrapment and premature coating failure.

For Immersion Service: (if required) Holiday test in accordance with ASTM D5162 for steel, or ASTM D4787 for concrete.

Do not apply the material beyond recommended pot life.

Do not mix previously catalyzed material with new.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with Reducer #130, R7K130.

For low temperature, atmospheric application, material should be at least 60°F (16°C).

Refer to Product Information sheet for additional performance characteristics and properties.

Safety Precautions

Refer to the SDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

Warranty

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.