Protective & Marine Coatings

MIL-DTL-24441/19C TYPE III

F159 EPOXY POLYAMIDE ZINC RICH PRIMER

PART A N10A359 **CLEAR RESIN**
PART B N10V359 **GRAY/GREEN HARDENER**

Revised: March 31, 2022

PRODUCT INFORMATION

9.42

PRODUCT DESCRIPTION

MIL-DTL-24441/19C Type III F159 is a two component, epoxy polyamide zinc rich primer. This product offers excellent cathodic protection as well as adhesion, water resistance, and chemical resistance.

PRODUCT CHARACTERISTICS

Finish: Flat

Color: Gray Green, Formula 159

Volume Solids: 64.6% ± 2%, mixed

Weight Solids: 84.9% ± 2%, mixed

VOC (EPA Method 24): Unreduced: <340 g/L; 2.80 lb/gal

Zinc Content in Dry Film: 85% by weight

Mix Ratio: 2 components, premeasured
1:4 by volume, 2.5 gallon mix

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	**5.0** (125)	**6.0** (150)
Dry mils (microns)	**3.0** (75)	**4.0** (100)
~Coverage sq ft/gal (m^2/L)	**250** (6.1)	**336** (8.2)
Theoretical coverage sq ft/gal (m^2/L) @ 1 mil / 25 microns dft	**1034** (25.3)	

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:	24 hours	18 hours	12 hours	8 hours
maximum:	14 days	12 days	10 days	7 days
Cure to service:	6 days	5 days	4 days	64 hours

Pot Life: 4 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

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: Hi-Flash Naphtha, R2K5

RECOMMENDED USES

For use on marine vessels over steel substrates to provide chemical and corrosion resistance.

- Complies with MIL-DTL-24441, F159, Type III.

PERFORMANCE CHARACTERISTICS

- Complies with Military Specification MIL-DTL-24441, F159, Type III.
- For use where SCAQMD Rule 102 air pollution regulations for solvent in marine coatings apply.

Color	Product/Rex Number
Zinc Primer Formula 159, Part A	N10A359
Zinc Primer, Gray/Green Part B	N10V359

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RECOMMENDED SYSTEMS

		Dry Film Thickness / ct. Mils	(Microns)
Steel:			
1 ct.	MIL-DTL-24441/19C Type III F159 Primer	3.0-4.0	(75-100)
2 cts.	MIL-DTL-24441, Type III Epoxy	3.0-4.0	(75-100)
Steel:			
1 ct.	MIL-DTL-24441/19C Type III F159 Primer	3.0-4.0	(75-100)
2 cts.	MIL-DTL-24441, Type IV Epoxy	4.0-6.0	(100-150)

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

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:

Part A: 1/2 gallon (1.89L)

Part B: 2 gallons (7.56L) in a 3 gallon (11.3L) container

Weight: 23.74 ± 0.5 lb/gal ; 2.85 Kg/L, mixed

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.

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APPLICATION BULLETIN

9.42

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. 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. Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

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 .....Hi-Flash Naphtha, R2K5

Airless Spray
(use Teflon packings and continuous agitation)
Pressure.....2000 - 3000 psi
Hose.....3/8" ID
Tip .....019"
Filter .....none
Reduction.....As needed up to 5% by volume

Conventional Spray
(continuous agitation required)
Gun .....Binks 95
Fluid Nozzle 68
Air Nozzle.....68P
Atomization Pressure.....50 psi
Fluid Pressure.....20 psi
Reduction.....As needed up to 5% by volume

Keep pressure pot at level of applicator to avoid blocking of fluid line due to weight of material. Blow back coating in fluid line at intermittent shutdowns, but continue agitation at pressure pot.

Brush
Brush.....Small areas only; Natural Bristle
Reduction.....Not recommended

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

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APPLICATION BULLETIN

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APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of Part B 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 four parts by volume of Part B. Thoroughly agitate the mixture with power agitation. After mixing, pour through a 60 mesh screen. Allow the material to sweat-in as indicated below prior to application. Re-stir before using. Continuous agitation of mixture during application is required, otherwise zinc dust will quickly settle out.

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:

	Minimum	Maximum
Wet mils (microns)	**5.0** (125)	**6.0** (150)
Dry mils (microns)	**3.0** (75)	**4.0** (100)
~Coverage sq ft/gal (m^2/L)	**250** (6.1)	**336** (8.2)
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NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

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To recoat:				
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maximum:	14 days	12 days	10 days	7 days
Cure to service:	6 days	5 days	4 days	64 hours
Pot Life:	4 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 Hi-Flash Naphtha, R2K5. Clean tools immediately after use with Hi-Flash Naphtha, R2K5. Follow manufacturer's safety recommendations when using any solvent.

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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.

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 Hi-Flash Naphtha, R2K5.

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

SAFETY PRECAUTIONS

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