



Protective & Marine Coatings

DURA-PLATE® 235 MULTI-PURPOSE EPOXY

PART A **B67-235** **SERIES COLORS**
PART B **B67V235** **HARDENER**

Revised: September 23, 2013

PRODUCT INFORMATION

4.67

PRODUCT DESCRIPTION

Dura-Plate 235 Multi-Purpose Epoxy is a modified epoxy phenalkamine, formulated specifically for immersion and atmospheric service in marine and industrial environments. Dura-Plate 235 provides exceptional performance in corrosive environment, and can be applied at temperatures as low as 0°F (-18°C).

- Self-priming
- Low temperature application, 0°F (-18°C)
- Surface tolerant - damp surfaces
- Provides salt water and fresh water immersion resistance
- Approved as a primer per MIL-PRF-23236, Type V, Class 7, Grade C
- Outstanding application properties

PRODUCT CHARACTERISTICS

Finish: Semi-Gloss
Color: Wide range of colors available
Volume Solids: 68% ± 2%, mixed
Weight Solids: 79% ± 2%, mixed
VOC (EPA Method 24): Unreduced: <280 g/L; 2.33 lb/gal
 Reduced 10%: <327 g/L; 2.72 lb/gal
Mix Ratio: 4:1 by volume

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	6.0 (150)	12.0 (300)
Dry mils (microns)	4.0* (100)	8.0* (200)
~Coverage sq ft/gal (m ² /L)	136 (3.3)	272 (6.6)
Theoretical coverage sq ft/gal (m ² /L) @ 1 mil / 25 microns dft	1088 (26.6)	

*See Performance Tips section

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

Drying Schedule @ 6.0 mils wet (150 microns):

	@ 0°F/-18°C	@ 40°F/4.5°C	@ 77°F/25°C 50% RH	@ 120°F/49°C
To touch:	18 hours	3.5 hours	2 hours	20 minutes
To handle:	36 hours	12 hours	3.5 hours	40 minutes
To recoat:				
minimum:	36 hours	12 hours	3.5 hours	40 minutes
maximum:	6 months	6 months	6 months	6 months
Cure to service:	30 days	14 days	7 days	3 days

*If maximum recoat time is exceeded, abrade surface before recoating.
 Drying time is temperature, humidity, and film thickness dependent.*

Pot Life: 16 hours 8 hours 4 hours 1 hour
Sweat-in-time: 1 hour 30 minutes 15 minutes 5 minutes

Shelf Life: Part A: 36 months, unopened
 Part B: 24 months, unopened
 Store indoors at 40°F (4.5°C) to 100°F (38°C).
Flash Point: 116°F (47°C) PMCC, mixed
Reducer/Clean Up: Reducer R7K104

RECOMMENDED USES

- For use over prepared steel and masonry surfaces.
- Salt water and fresh water immersion resistance
 - Ballast tanks, offshore and marine structures
 - Bilges and wet void areas
 - Above- and below- water hull areas
 - Decks and superstructures
 - Water and waste water tanks
 - Acceptable for use with cathodic protection systems.
 - Dura-Plate 235 Black meets or exceeds the performance criteria of C-200; SSPC Paint 16; and Mil-P-23236B(SH) Type I or IV Class 2
 - Suitable for use in USDA inspected facilities
 - Conforms to MPI # 101

PERFORMANCE CHARACTERISTICS

Substrate*: Steel
Surface Preparation*: SSPC-SP10/NACE 2
System Tested*:
 2 cts. Dura-Plate 235 @ 5.0 mils (125 microns) dft/ct
 *unless otherwise noted below

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060 CS17 wheel, 1000 cycles, 1 kg load	65 mg loss
Adhesion	ASTM D4541	850 psi
Direct Impact Resistance	ASTM D2794	10 in lb
Dry Heat Resistance	ASTM D2485	250°F (121°C)
Moisture Condensation Resistance	ASTM D4585, 100°F (38°C), 2000 hours	Rating 10 per ASTM D610 for rusting; Rating 10 per ASTM D714 for blistering
Pencil Hardness	ASTM D3363	H

IMMERSION (Ambient temperature)

- Salt Water.....Recommended
- Fresh Water.....Recommended
- Ballast Tank MixRecommended

Epoxy coatings may darken or yellow following application and curing.



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RECOMMENDED SYSTEMS

	Dry Film Thickness / ct.	
	Mils	(Microns)
Steel, immersion or atmospheric service:		
2 cts. Dura-Plate 235	4.0-8.0	(100-200)
Steel, immersion service:		
1 ct. Dura-Plate 235	4.0-8.0	(100-200)
1-2 cts. TarGuard Coal Tar Epoxy	8.0-16.0	(200-400)
Steel, immersion service:		
2 cts. Dura-Plate 235	4.0-8.0	(100-200)
2 cts. SeaGuard Anti-Foulant (refer to respective data pages for coverage)		
Steel, atmospheric service:		
1 ct. Dura-Plate 235	4.0-8.0	(100-200)
1-2 cts. Macropoxy 646	5.0-10.0	(125-250)
Steel, atmospheric service:		
1 ct. Zinc-Clad II Plus	3.0-5.0	(75-125)
1-2 cts. Dura-Plate 235	4.0-8.0	(100-200)
Steel, atmospheric service:		
1 ct. Zinc-Clad IV	3.0-5.0	(75-125)
1-2 cts. Dura-Plate 235	4.0-8.0	(100-200)
Steel, atmospheric service:		
1 ct. Corothane I GalvaPac Zinc Primer	3.0-4.0	(75-100)
1-2 cts. Dura-Plate 235	4.0-8.0	(100-200)
Steel, atmospheric service:		
1 ct. Dura-Plate 235	4.0-8.0	(100-200)
1-2 cts. Acrolon 218 HS	3.0-6.0	(75-150)
or Hi-Solids Polyurethane	3.0-5.0	(75-125)
Concrete/Masonry, immersion service:		
1 ct. Kem Cati-Coat HS Epoxy Filler/Sealer as required to fill voids and provide a continuous substrate	10.0-20.0	(250-500)
2 cts. Dura-Plate 235	4.0-8.0	(100-200)
Galvanized, atmospheric service:		
1 ct. Dura-Plate 235	4.0-8.0	(100-200)

Steel-Seam FT910 - as required for filling pits, and transitioning sharp edges, weld seams, etc...

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-SP2 or SSPC-SP12/NACE 5, WJ-4
Immersion: SSPC-SP10, 2 mil (50 micron) profile or SSPC-SP-12/NACE 5, WJ-2

Concrete & Masonry:
Atmospheric: SSPC-SP13/NACE 6, or ICRI No. 310.2, CSP 1-3
Immersion: SSPC-SP13/NACE 6-4.3.1 or 4.3.2, or ICRI No. 310.2, CSP1-3

Galvanized, atmospheric: SSPC-SP1

Condition of Surface	Surface Preparation Standards		SSPC	NACE
	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900		
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	C St 2	C St 2	SP 2	-
Pitted & Rusty	D St 2	D St 2	SP 2	-
Power Tool Cleaning	C St 3	C St 3	SP 3	-
Pitted & Rusty	D St 3	D St 3	SP 3	-

TINTING

Tint Part A with Maxitones only. Mill White tints at 150%. Ultradeep Base tints at 100%. Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.

APPLICATION CONDITIONS

Temperature: 0°F (-18°C) minimum, 120°F (49°C) maximum (air and surface)
At least 5°F (2.8°C) above dew point
Material should be at least 40°F (4.5°C) for optimal performance.
Relative humidity: 85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:
Part A: 1 gallon (3.78L) and 4 gallons (15.1L) in a 5 gallon (18.9L) container
Part B: 1 quart (0.94L) and 1 gallon (3.78L)
Weight: 11.3 ± 0.2 lb/gal ; 1.35 Kg/L, mixed may vary with color

SAFETY PRECAUTIONS

Refer to the MSDS 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.

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

DISCLAIMER

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PART B

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APPLICATION BULLETIN

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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 or SSPC-SP12/NACE 5. For SSPC-SP10/NACE 2, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils / 50 microns). For SSPC-SP12/NACE No. 5, all surfaces to be coated shall be cleaned in accordance with WJ-2. Pre-existing profile should be approximately 2 mils (50 microns). Light rust bloom is allowed. Remove all weld spatter and round all sharp edges by grinding. Prime any bare steel the same day as it is cleaned.

Iron & Steel, Atmospheric Service:

Minimum surface preparation is Hand Tool Clean per SSPC-SP2 or SSPC-SP12/NACE 5. For surfaces prepared by SSPC-SP2, first remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. For better performance, use Commercial Blast Cleaning per SSPC-SP6/NACE 3, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). For surfaces prepared by SSPC-SP12/NACE No. 5, all surfaces shall be cleaned in accordance with WJ-4. Pre-existing profile should be approximately 2 mils (50 microns). Prime any bare steel the same day as it is cleaned.

Galvanized Steel

Allow to weather a minimum of six months prior to coating. Solvent Clean per SSPC-SP1 (recommended solvent is VM&P Naphtha). When weathering is not possible, or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test patch. Allow paint to dry at least one week before testing adhesion. If adhesion is poor, brush blasting per SSPC-SP7 is necessary to remove these treatments. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned.

Concrete and Masonry

For surface preparation, refer to SSPC-SP13/NACE 6, or ICRI No. 310.2, CSP 1-3. Surfaces should be thoroughly clean and dry. Concrete and mortar must be cured at least 28 days @ 75°F (24°C). Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement and hardeners. Fill bug holes, air pockets and other voids with Steel-Seam FT910.

Concrete, Immersion Service:

For surface preparation, refer to SSPC-SP13/NACE 6, Section 4.3.1 or 1.3.2 or ICRI No. 310.2, CSP 1-3.

Follow the standard methods listed below when applicable:

ASTM D4258 Standard Practice for Cleaning Concrete.
ASTM D4259 Standard Practice for Abrading Concrete.
ASTM D4260 Standard Practice for Etching Concrete.
ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete.
SSPC-SP 13/Nace 6 Surface Preparation of Concrete.
ICRI No. 310.2 Concrete Surface Preparation.

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	C St 2	C St 2	SP 2	-
Pitted & Rusted	D St 2	D St 2	SP 2	-
Rusted	C St 3	C St 3	SP 3	-
Power Tool Cleaning	Pitted & Rusted D St 3	D St 3	SP 3	-

APPLICATION CONDITIONS

Temperature: 0°F (-18°C) minimum, 120°F (49°C) maximum (air and surface)
At least 5°F (2.8°C) above dew point

Material should be at least 40°F (4.5°C) for optimal performance.

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 UpReducer R7K104

Airless Spray

Unit.....30:1 Pump
Pressure.....2400 - 2800 psi
Hose.....1/4" - 3/8" ID
Tip0.015" - .019"
Filter60 mesh
Reduction.....As needed, up to 10% by volume

Conventional Spray

GunDeVilbiss MBC-510
Fluid TipE
Air Nozzle.....704
Atomization Pressure.....60-65 psi
Fluid Pressure.....5-15 psi
Reduction.....As needed, up to 10% by volume

Brush

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

Roller

Cover3/8" woven with solvent resistant core
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 each component thoroughly using low speed power agitation. Make certain no pigment remains on the bottom of the can. Then combine 4 parts by volume of Part A with 1 part by volume of Part B. Thoroughly agitate the mixture with power agitation. Allow the material to sweat-in as indicated 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:

	Minimum	Maximum
Wet mils (microns)	6.0 (150)	12.0 (300)
Dry mils (microns)	4.0* (100)	8.0* (200)
~Coverage sq ft/gal (m ² /L)	136 (3.3)	272 (6.6)
Theoretical coverage sq ft/gal (m ² /L) @ 1 mil / 25 microns dft	1088 (26.6)	

*See Performance Tips section

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

Drying Schedule @ 6.0 mils wet (150 microns):

	@ 0°F/-18°C	@ 40°F/4.5°C	@ 77°F/25°C 50% RH	@ 120°F/49°C
To touch:	18 hours	3.5 hours	2 hours	20 minutes
To handle:	36 hours	12 hours	3.5 hours	40 minutes
To recoat:				
minimum:	36 hours	12 hours	3.5 hours	40 minutes
maximum:	6 months	6 months	6 months	6 months
Cure to service:	30 days	14 days	7 days	3 days

*If maximum recoat time is exceeded, abrade surface before recoating.
Drying time is temperature, humidity, and film thickness dependent.*

Pot Life:	16 hours	8 hours	4 hours	1 hour
Sweat-in-time:	1 hour	30 minutes	15 minutes	5 minutes

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 R7K104. Clean tools immediately after use with Reducer R7K104. Follow manufacturer's safety recommendations when using any solvent.

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PERFORMANCE TIPS

Stripe coat 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.

Insufficient ventilation, incomplete mixing, miscatalyzation, and external heaters may cause premature yellowing.

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 mix previously catalyzed material with new.

Do not apply the material beyond recommended pot life.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with Reducer R7K104.

Please contact your Sherwin-Williams Representative for recommendations for immersion service of tinted material.

When coating over aluminum and galvanizing, recommended dft is 2-4 mils (50-100 microns).

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

SAFETY PRECAUTIONS

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