Protective & Marine Coatings

EPO-PHEN™ FF
TANK LINING AND HIGH TEMP COATING

PART A	B62A55	GRAY
PART B	B62V55	HARDENER
PART B	B62V56	LOW TEMP HARDENER

Revised: February 14, 2025

PRODUCT INFORMATION

1306-1

PRODUCT DESCRIPTION

EPO-PHEN FF is a flake filled epoxy phenolic novolac lining for protection from corrosion under insulation.

PRODUCT CHARACTERISTICS

Finish: Semi-Gloss
Colors: Gray
Volume Solids: 70% ± 2%, mixed
VOC (EPA Method 24): <250 g/L; 2.08 lb/gal
Mix Ratio: 4:1 by volume

Recommended Spreading Rate per coat:

	Minimum		Maximum	
Wet mils (microns)	**10.0**	(250)	**13.0**	(325)
Dry mils (microns)	**7.0**	(175)	**9.0***	(225)
~Coverage sq ft/gal (m^2/L)	**125**	(3.0)	**160**	(3.9)
Theoretical coverage **sq ft/gal** (m^2/L) @ 1 mil / 25 microns dft	**1120**	(27.4)		

See Recommended Systems on Page 2

Drying Schedule @ 12.0 mils wet (300 microns):

with Standard Hardener:

	50°F (13°C)	77°F (25°C) *50% RH*	100°F (38°C)
To touch:	6 hours	3 hours	1 hour
To handle:	18 hours	8 hours	2 hours
To recoat:			
minimum:	48 hours	16 hours	6 hours
maximum:	30 days	30 days	30 days
To cure:	21 days	7 days	3 days
Heat cure:	8 hours @ ambient, then 16 hours @ 140°F (60°C)		
Pot Life*:	4 hours	2 hours	30 minutes
Sweat-in-Time:	None Required		

with Low Temp Hardener:

	35°F (1.6°C)	77°F (25°C) *50% RH*
To touch:	24 hours	4 hours
To handle:	48 hours	6 hours
To recoat:		
minimum:	24 hours	24 hours
maximum:	30 days	30 days
To cure:		
atmospheric:	5 days	1 day
immersion:	7 days	7 days
Pot Life*:	4 hours	1.5 hours
Sweat-in-Time:	None Required	

**Reduced 10% with Reducer #15. Pot life is dependent upon temperature and mass*

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

Shelf Life: 24 months, unopened
Store indoors at 40°F (4.5°C) to 100°F (38°C).
Flash Point: 89°F (32°C), Seta Flash, mixed
Reducer / Clean Up[1]: VOC Restricted Areas (<250 g/L): use Reducer #111

[1]Other VOC areas (<340 g/L): use Reducer #111 or Reducer #15. Choose a reducer that is compliant in your area. Confirm compliance with state and local air quality rules before use.

RECOMMENDED USES

External lining for steel and stainless steel tanks, pipes and process vessels under thermal insulation at elevated temperatures and/or cryogenic service. May be used as an API 652 compliant thin film lining for immersion service in crude/water service at elevated temperatures. May be used in firetube service.

- This product meets specific design requirements for non-safety related nuclear plant applications in Level II, III and Balance of Plant, and DOE nuclear facilities*

* Nuclear qualifications are NRC license specific to the facility

PERFORMANCE CHARACTERISTICS

Substrate*: Steel, complies with NACE SP0198 CUI System CS-4
Surface Preparation*: SSPC-SP10/NACE 2
System Tested*: 1 ct: Epo-Phen FF (B62V55) @ 7.0-9.0 mils (175-225 microns) dft
*unless otherwise noted below

Test Name	Test Method	Result
Abrasion Resistance	ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load	129 mg loss
Adhesion	ASTM D4541	750 psi
Control of Corrosion under Thermal Insulation (Wet/Dry Thermal Cycling)	NACE RP0198 300°F (149°C), 12 mils (300 microns) dft: 425°F (218°C), 9 mils (225 microns) dft:	Passes, Complies with NACE RP-0198 Cui systems SS-3 and CS-4 Passes
Flexibility	NACE RP-0394	3.29%
Immersion Elevated Temperature*		Passes 6 months at 204°F (96°C) in gearbox oil
Pencil Hardness	ASTM D3363	4H
Temperature Resistance (dry service)	ASTM D2485	425°F (218°C), constant; 450°F (232°C) intermittent, may discolor above 200°F (93°C)
Thermal Cycling	-320°F (-160°C) over carbon and stainless steel	Passes

*Report No. IM54.1382-09

RESISTANCE GUIDE - IMMERSION (Ambient Temperature)

- Alkalies..... Recommended (150°F/66°C)
- Crude oil..... Recommended (220°F/104°C)
- Diesel fuel..... Recommended (120°F/49°C)
- Lubricating oils..... Recommended (120°F/49°C)
- Fuel oils..... Recommended (120°F/49°C)
- Aromatic solvents..... Recommended (120°F/49°C)
- Hi-aromatic gasoline..... Recommended (120°F/49°C)
- Ethanol gasohol..... Recommended (130°F/54°C)
- MTBE, ETBE, TAME..... Recommended (120°F/49°C)
- Ether/fuel blends (reformed gas)..... Recommended (120°F/49°C)
- Water, distilled water, & demineralized water..... Recommended (210°F/99°C)
- Methanol, or blends*..... Recommended (100°F/38°C)
- Ethanol, or blends..... Recommended (120°F/49°C)

* Low Temp Hardener (B62V56) not reccomended

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RECOMMENDED SYSTEMS

		Dry Film Thickness / ct. Mils	(Microns)
Steel/Stainless Steel, high temperature resistance up to 450°F (232°C)			
1 Ct.	Epo-Phen FF	7.0-9.0*	(175-225)*
OR			
2 Cts.	Epo-Phen FF	3.5-4.5*	(87-112)*
Steel/Stainless Steel, high temperature resistance up to 300°F (149°C)			
2 Cts.	Epo-Phen FF	5.0-8.0	(125-200)
Carbon Steel or Stainless Steel, immersion/tank lining			
2 Cts.	Epo-Phen FF	5.0-8.0	(125-200)
Carbon Steel or Stainless Steel, firetube service			
2 Cts.	Epo-Phen FF	4.0-6.0*	(100-150)*

*Do not apply over 12.5 mils (313 microns) total dft for service above 300°F (149°C), or for firetube service. For all other services, Epo-Phen FF may be applied up to 16 mils (400 microns) total dft, depending on application conditions. Consult your Sherwin-Williams representative for additional information.

Concrete, immersion/tank lining:			
1 ct.	Kem Cati-Coat HS	10.0-20.0	(250-500)
2 cts.	Epo-Phen FF	5.0-8.0	(125-200)

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

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.

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:

Immersion: SSPC-SP10/NACE 2/ISO8501-1:2007 Sa 2.5, 2-3 mil (50-75 micron) profile

Atmospheric: SSPC-SP11, SSPC-SP2 or ISO8501-1:2007 St 2

Concrete & Masonry:

Immersion: SSPC-SP13/NACE 6 - 4.3.1 or 4.3.2, or ICRI No. 310.2R CSP 2-3

Surface Preparation Standards

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

TINTING

Do not tint.

APPLICATION CONDITIONS

Temperature (air, surface, material):

Standard Hardener: 50°F (10°C) minimum, 120°F (49°C) maximum. Substrate up to 300°F (149°C).

Low Temp Hardener: 35°F (1.7°C) minimum, 77°F (25°C) maximum

At least 5°F (2.8°C) above dew point

Relative humidity: 85% maximum

ORDERING INFORMATION

Packaging: 1.25 gallons (4.7L) and 5 gallons (18.9L), mixed

Part A: 1 gallon (3.8L) and 4 gallons (15.1L)
Part B 0.25 gallons (0.9L) and 1 gallon (3.8L)

Weight: 12.45 ± 0.2 lb/gal ; 1.5 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.

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Revised: February 14, 2025

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.

Steel/Stainless Steel, under insulation, immersion
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 (2 mils / 50 microns). Remove all weld spatter and round all sharp edges. Prime any bare steel the same day as it is cleaned.
On stainless steel, use Aluminum Oxide grit. Do not use chlorinated solvents for cleaning stainless steel.

Steel, non-insulated, atmospheric
Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Power Tool Cleaning to Bare Metal per SSPC-SP11 is also acceptable. 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 / 50 microns). Remove all weld spatter and round all sharp edges. Prime any bare steel within 8 hours or before flash rusting occurs.

Concrete and Masonry
For surface preparation, refer to SSPC-SP13/NACE 6, or ICRI No. 310.2R, CSP 2-3. 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. Primer required.

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. 310.2R Concrete Surface Preparation.

Concrete, Immersion Service:
For surface preparation, refer to SSPC-SP13/NACE 6, Section 4.3.1 or 1.3.2 or ICRI No. 310.2R, CSP 2-3.

Immersion Service:
In addition to the above surface preparation, abrasive blasting of the concrete surface is required.

Surface Preparation Standards

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

APPLICATION CONDITIONS

Temperature (air, surface, material):
Standard Hardener: 50°F (10°C) minimum, 120°F (49°C) maximum. Substrate up to 300°F (149°C).
Low Temp Hardener: 35°F (1.7°C) minimum, 77°F (25°C) maximum
At least 5°F (2.8°C) above dew point

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[1]: VOC Restricted Areas (<250 g/L): use Reducer #111

[1]Other VOC areas (<340 g/L): use Reducer #111 or Reducer #15. Choose a reducer that is compliant in your area. Confirm compliance with state and local air quality rules before use.

Airless Spray**
Unit.....45:1 pump, minimum
Pressure.....3600 psi minimum (248 bar)
Hose.....3/8"-1/2" ID (9.5-12.7 mm)
Gun .....Graco XTR 7
Tip .....019"-.021" (0.48-0.53 mm), Graco XHD RAC
Filter .....30 mesh

Conventional Spray**
Gun .....Binks 95
Tip and Needle.....66/65
Air Nozzle.....63PH-1
Atomization Pressure.....65-75 psi (4.5-5.1 bar)
Fluid Pressure.....15-20 psi (1.0-1.4 bar)

Brush** .....For stripe coating and repair only
Brush.....Nylon/Polyester or Natural Bristle

Roller.....For stripe coating and repair only
Cover .....3/8" woven with solvent resistant core

***Reduction..... As needed up to 15% by volume*

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

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Revised: February 14, 2025

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. Re-stir before using. Product will produce an orange peel appearance when applied at elevated temperatures.

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

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

Recommended Spreading Rate per coat:

	Minimum		Maximum	
Wet mils (microns)	**10.0**	(250)	**13.0**	(325)
Dry mils (microns)	**7.0**	(175)	**9.0***	(225)
~Coverage sq ft/gal (m^2/L)	**125**	(3.0)	**160**	(3.9)
Theoretical coverage **sq ft/gal** (m^2/L) @ 1 mil / 25 microns dft	**1120**	(27.4)		

*See Recommended Systems on Page 2

Drying Schedule @ 12.0 mils wet (300 microns):

with Standard Hardener:

	50°F (13°C)	77°F (25°C) *50% RH*	100°F (38°C)
To touch:	6 hours	3 hours	1 hour
To handle:	18 hours	8 hours	2 hours
To recoat:			
minimum:	48 hours	16 hours	6 hours
maximum:	30 days	30 days	30 days
To cure:	21 days	7 days	3 days
Heat cure:	8 hours @ ambient, then 16 hours @ 140°F (60°C)		
Pot Life*:	4 hours	2 hours	30 minutes
Sweat-in-Time:	None Required		

with Low Temp Hardener:

	35°F (1.6°C)	77°F (25°C) *50% RH*
To touch:	24 hours	4 hours
To handle:	48 hours	6 hours
To recoat:		
minimum:	24 hours	24 hours
maximum:	30 days	30 days
To cure:		
atmospheric:	5 days	1 day
immersion:	7 days	7 days
Pot Life*:	4 hours	1.5 hours
Sweat-in-Time:	None Required	

**Reduced 10% with Reducer #15. Pot life is dependent upon temperature and mass*

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

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

PERFORMANCE TIPS

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

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with Reducer #15.

Do not mix previously catalyzed material with new.

Not recommended for potable water immersion.

When spraying above 120°F (49°C), reduce material 10% with Reducer #100. Spray apply only. Product will produce an orange peel appearance when applied at elevated temperatures.

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

SAFETY PRECAUTIONS

Refer to the SDS sheet before use.

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