



# Protective & Marine Coatings

# MACROPOXY™ 646 EPOXY PRIMER FINISH

Revised 07/2020 Issue 3

## PRODUCT INFORMATION

### PRODUCT DESCRIPTION

A versatile high performance polyamide cured epoxy designed to fulfil the needs of both new construction and maintenance painting. User friendly with a 1:1 mix ratio, it is fast drying, surface tolerant and available in a range of colours making it ideal for atmospheric and immersion service.

- Low VOC
- Low odour
- Outstanding application properties
- Chemical resistant
- Abrasion resistant

### PRODUCT CHARACTERISTICS

<b>Finish:</b>	Semi-Gloss
<b>Colours:</b>	White and a range of colours
<b>Volume Solids:</b>	72% ± 2%, mixed, White
<b>Weight Solids:</b>	85% ± 2%, mixed, White
<b>VOC:</b>	Unthinned: <250 g/ltr Thinned 10%: <300 g/ltr
<b>Mix Ratio:</b>	1:1 by volume

#### Recommended Spreading Rate per coat:

	Minimum	Maximum
<b>Wet microns</b>	<b>174</b>	<b>347</b>
<b>Dry microns</b>	<b>125</b>	<b>250</b>
<b>Theoretical Coverage m<sup>2</sup>/ltr</b>	<b>5.8</b>	<b>2.9</b>

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

#### Drying Schedule @ 175 microns:

	@ 2°C	@ 25°C 50% RH	@ 38°C
<b>To touch:</b>	5 hours	2 hours	1.5 hours
<b>To handle:</b>	48 hours	8 hours	4.5 hours
<b>To recoat:</b>			
<b>minimum:</b>	48 hours	8 hours	4.5 hours
<b>maximum:</b>	1 year	1 year	1 year
<b>To cure:</b>			
<b>Service:</b>	10 days	7 days	4 days
<b>Immersion:</b>	14 days	7 days	4 days

*If maximum recoat time is exceeded, abrade surface before recoating. Drying time is temperature, humidity, and film thickness dependent. Paint temperature must be at least 4.5°C minimum.*

<b>Pot Life:</b>	10 hours	4 hours	2 hours
<b>Induction Time:</b>	30 minutes	30 minutes	15 minutes

<b>Shelf Life:</b>	36 months, unopened Store indoors at 4.5°C to 38°C.
<b>Flash Point:</b>	33°C mixed
<b>Cleanser / Thinner:</b>	C50

### PERFORMANCE CHARACTERISTICS

**Substrate:** Steel  
**Surface Preparation:** SSPC-SP10/NACE 2/Sa2½  
**System Tested:** 1 ct. Macropoxy 646 Fast Cure @ 150 microns dft

Test Name	Test Method	Results
<b>Abrasion Resistance</b>	ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load	84 mg loss
<b>Accelerated Weathering-QUV</b>	ASTM D4587, QUV-A, 12,000 hours	Passes
<b>Adhesion</b>	ASTM D4541	1,037 psi
<b>Nuclear Decontamination</b>	ASTM D4256/ANSI N 5.12	99% Water Wash; 95% Overall
<b>Direct Impact Resistance</b>	ASTM D2794	13.55J
<b>Dry Heat Resistance</b>	ASTM D2485	121°C
<b>Exterior Durability</b>	1 year at 45° South	Excellent, chalks
<b>Flexibility</b>	ASTM D522, 180° bend, 3/4" mandrel	Passes
<b>Humidity Resistance</b>	ASTM D4585, 6000 hours	No blistering, cracking, or rusting
<b>Immersion</b>	1 year fresh and salt water	Passes, no rusting, blistering, or loss of adhesion
<b>Radiation Tolerance</b>	ASTM D4082 / ANSI 5.12	Pass at 525 microns
<b>Pencil Hardness</b>	ASTM D3363	3H
<b>Surface Burning</b>	ASTM E84/NFPA 255	Flame Spread Index 20; Smoke Development Index 35 (at 18 mils or 450 microns)
<b>Water Vapour Permeance</b>	ASTM D1653, Method B	1.007 metric perms

Epoxy coatings may darken or discolour following application and curing.

### 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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## PRODUCT INFORMATION

### RECOMMENDED USES

- Marine applications
- Pulp and paper mills
- Power plants
- Offshore platforms
- Nuclear Power Plants
- White is acceptable for immersion use for salt water and fresh water, not acceptable for potable water
- Refineries
- Chemical plants
- Tank exteriors
- Water treatment plants

\* Tinting is not recommended for immersion service.

### RECOMMENDED SYSTEMS

	Dry Film Thickness / ct.	Microns
<b>Immersion and atmospheric:</b>		
<b>Steel:</b>		
2 cts. Macropoxy 646		125-250
<b>Concrete/Masonry, smooth:</b>		
2 cts. Macropoxy 646		125-250
<b>Aluminum:</b>		
2 cts. Macropoxy 646		125-250
<b>Galvanizing:</b>		
2 cts. Macropoxy 646		125-250

#### FIRETEX ONLY:

**Steel & Galvanized Substrates being primed for FIRETEX only:**  
1 ct. Macropoxy 646 50-125

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:

Steel	
Atmospheric:	SSPC-SP2/3 (St2/St3)
Immersion:	SSPC-SP10/NACE 2/Sa2½ 50-75 micron profile
Aluminum:	SSPC-SP1
Galvanizing:	SSPC-SP1; (See Page 3 details)

#### 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	-
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:	2°C minimum, 49°C maximum (air and surface) 4.5°C minimum, 49°C maximum (material) At least 3°C above dew point
Relative humidity:	85% maximum

Refer to product Application Bulletin for detailed application information.

### ORDERING INFORMATION

#### Packaging:

Base (Part A):	10ltr in 20ltr pail
Additive (Part B):	10ltr in 12.5ltr pail
Weight:	1.55 Kg/ltr mixed, may vary by colour

### 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.



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## 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.

### Steel, Atmospheric Service:

Minimum surface preparation is Hand Tool Clean per SSPC-SP2. 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/Sa2, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile 50-75 microns. Prime any bare steel before flash rusting occurs.

### 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/Sa2½. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile 50-75 microns. Remove all weld spatter and round all sharp edges by grinding. Prime any bare steel the same day as it is cleaned.

### Aluminium

Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1.

### 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/NACE 4 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.

In preparing galvanized steel substrates for the application of FIRETEX intumescent coating systems, Surface Preparation Specification SSPC-SP 16 (brush off blast cleaning of non-ferrous metals) must be followed obtaining a surface profile of minimum 30 microns. Optimum surface profile will not exceed 50 microns.

### 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	D St 3	D St 3	SP 3	-

## APPLICATION CONDITIONS

Temperature:	2°C minimum, 49°C maximum (air and surface) 4.5°C minimum, 49°C maximum (material) Substrate temperature at least 3°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 thinning must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

### Cleanser / Thinner .....C50

### Airless Spray

Pump.....	30:1
Pressure.....	2800 - 3000 psi
Hose.....	1/4" ID
Tip .....	.017" - .023"
Filter .....	60 mesh
Reduction.....	As needed up to 10% by volume

### Conventional Spray

Gun .....	DeVilbiss MBC-510
Fluid Tip .....	E
Air Nozzle.....	704
Atomization Pressure.....	60-65 psi
Fluid Pressure.....	10-20 psi
Thinning .....	As needed up to 10% by volume
Requires oil and moisture separators	

### Brush

Brush.....	Nylon/Polyester or Natural Bristle
Thinning .....	Not recommended

### Roller

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

### Plural Component Spray ...Acceptable

Refer to Technical Bulletin - "Application Guidelines for Macropoxy 646 & Recoatable Epoxy Primer Utilising Plural Component Equipment"

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



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## 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 Induction time as indicated prior to application. Re-stir before using.

If thinner solvent is used, add only after both components have been thoroughly mixed and after induction

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

### Recommended Spreading Rate per coat:

	Minimum	Maximum
<b>Wet microns</b>	<b>175</b>	<b>347</b>
<b>Dry microns</b>	<b>125</b>	<b>250</b>
<b>Theoretical Coverage m<sup>2</sup>/ltr</b>	<b>5.76</b>	<b>2.88</b>

\*May be applied at 75-250 microns dft in atmospheric conditions.

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

### Drying Schedule @ 7.0 mils wet (175 microns):

	@ 2°C	@ 25°C 50% RH	@ 38°C
<b>To touch:</b>	5 hours	2 hours	1.5 hours
<b>To handle:</b>	48 hours	8 hours	4.5 hours
<b>To recoat:</b>			
<b>minimum:</b>	48 hours	8 hours	4.5 hours
<b>maximum:</b>	1 year	1 year	1 year
<b>To cure:</b>			
<b>Service:</b>	10 days	7 days	4 days
<b>Immersion:</b>	14 days	7 days	4 days

*If maximum recoat time is exceeded, abrade surface before recoating.*

*Drying time is temperature, humidity, and film thickness dependent.*

Paint temperature must be at least 4.5°C minimum.

<b>Pot Life:</b>	10 hours	4 hours	2 hours
<b>Induction Time:</b>	30 minutes	30 minutes	15 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 Cleanser C50 Clean tools immediately after use with Cleanser C50. Follow manufacturer's safety recommendations when using any solvent.

## 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 thinning of material can affect film build, appearance, and adhesion.

Do not mix previously mixed 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 recommended Cleanser.

Tinting is not recommended for immersion service.

Use only White for immersion service.

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.

When coating over aluminum and galvanizing, recommended dft is 50-100 microns.

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