Protective & Marine Coatings

# MACROPOXY® 646-100 FAST CURE EPOXY

| | | |
|---|---|---|
| PART A | B58-620 | SERIES |
| PART B | B58V620 | HARDENER |

Revised: May 6, 2013

## PRODUCT INFORMATION

4.52

### PRODUCT DESCRIPTION

**MACROPOXY 646-100 FAST CURE EPOXY** is a high solids, less than 100 g/L VOC, high build, fast drying, polyamide epoxy designed to protect steel and concrete in industrial exposures. Ideal for maintenance painting and fabrication shop applications. The high solids content ensures adequate protection of sharp edges, corners, and welds. This product can be applied directly to marginally prepared steel surfaces.

- Low VOC,<100 g/L
- Low odor
- Outstanding application properties
- Chemical resistant
- Abrasion resistant

### PRODUCT CHARACTERISTICS

| | |
|---|---|
| **Finish:** | Semi-Gloss |
| **Color:** | Mill White and a wide range of colors available through tinting |
| **Volume Solids:** Mill White | 73% ± 2%, mixed |
| **Weight Solids:** Mill White | 83% ± 2%, mixed |
| **VOC (EPA Method 24):** mixed | Unreduced: <100 g/L; .83 lb/gal<br>Reduced 10%: <100 g/L; .83 lb/gal |
| **Mix Ratio:** | 1:1 by volume |

**Recommended Spreading Rate per coat:**

| | Minimum | | Maximum | |
|---|---|---|---|---|
| **Wet mils** (microns) | **7.0** | (175) | **13.5** | (338) |
| **Dry mils** (microns) | **5.0*** | (125) | **10.0*** | (250)* |
| **~Coverage sq ft/gal** ($m^2$/L) | **116** | (2.8) | **232** | (5.7) |
| Theoretical coverage **sq ft/gal** ($m^2$/L) @ 1 mil / 25 microns dft | **1168** | (28.6) | | |

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

*See Recommended Systems on reverse side. See Performance Tips section also.

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

| | @ 40°F/4.5°C | @ 77°F/25°C *50% RH* | @ 100°F/38°C |
|---|---|---|---|
| **To touch:** | 4-5 hours | 2 hours | 1.5 hours |
| **To handle:** | 48 hours | 8 hours | 4.5 hours |
| **To recoat:** | | | |
| **minimum:** | 48 hours | 8 hours | 4.5 hours |
| **maximum:** | 1 year | 1 year | 1 year |
| **Cure for** | | | |
| **service:** | 10 days | 7 days | 4 days |
| **immersion:** | 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.*

| | | | |
|---|---|---|---|
| **Pot Life:** | 10 hours | 4 hours | 2 hours |
| **Sweat-in-time:** | 30 minutes | 30 minutes | 15 minutes |

| | |
|---|---|
| **Shelf Life:** | 36 months, unopened<br>Store indoors at 40°F (4.5°C) to 100°F (38°C). |
| **Flash Point:** | 61°F (16°C), PMCC, mixed |
| **Reducer/Clean Up:** | Reducer R7K111 or Oxsol 100 |

### RECOMMENDED USES

- Marine applications
- Fabrication shops
- Pulp and paper mills
- Power plants
- Offshore platforms
- Refineries
- Chemical plants
- Tank exteriors
- Water treatment plants
- Mill White is acceptable for immersion use for salt water and fresh water
- Not acceptable for potable water
- Suitable for use in USDA inspected facilities
- Conforms to AWWA D102 OCS #5
- Approved with FIRETEX hydrocarbon coatings

### PERFORMANCE CHARACTERISTICS

**Substrate***: Steel

**Surface Preparation***: SSPC-SP10/NACE 2

**System Tested***:

1 ct. Macropoxy 646-100 Fast Cure @ 6.0 mils (150 microns) dft

*unless otherwise noted below

| Test Name | Test Method | Results |
|---|---|---|
| **Abrasion Resistance** | ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load | 84 mg loss |
| **Accelerated Weathering - QUV[1]** | ASTM D4587, QUV-A, 12,000 hours | Passes |
| **Adhesion** | ASTM D4541 | 1,037 psi |
| **Corrosion Weathering[1]** | ASTM D5894, 36 cycles, 12,000 hours | Rating 10 per ASTM D714 for blistering; Rating 9 per ASTM D610 for rusting |
| **Direct Impact Resistance** | ASTM D2794 | 30 in. lb. |
| **Dry Heat Resistance** | ASTM D2485 | 250°F (121°C) |
| **Exterior Durability** | 1 year at 45° South | Excellent, chalks |
| **Flexibility** | ASTM D522, 180° blend, 3/4" mandrel | Passes |
| **Immersion** | 1 year fresh and salt water | Passes, no rusting, blistering, or loss of adhesion |
| **Pencil Hardness** | ASTM D3363 | 3H |
| **Salt Fog Resistance[1]** | ASTM B117, 6,500 hours | Rating 10 per ASTM D610 for rusting; Rating 9 per ASTM D1654 for corrosion |
| **Water Vapor Permeance** | ASTM D1653, Method B | 1.16 grains/day |

Epoxy coatings may darken or discolor following application and curing.

*Footnotes:*

*[1] Zinc Clad II Plus Primer*



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| PART B | B58V620 | HARDENER |

## PRODUCT INFORMATION

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## RECOMMENDED SYSTEMS

| | | Dry Film Thickness / ct. Mils | (Microns) |
|---|---|---|---|
| **Immersion and atmospheric:** | | | |
| **Steel:** | | | |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| **Concrete/Masonry, smooth:** | | | |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| **Concrete Block:** | | | |
| 1 ct. | Kem Cati-Coat HS Epoxy Filler/Sealer as needed to fill voids and provide a continuous substrate. | 10.0-20.0 | (250-500) |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| **Atmospheric:** | | | |
| ***Steel:** | | | |
| (Shop applied system, new construction, AWWA D102, can also be used at 3 mils (75 microns) dft when used as an intermediate coat as part of a multi-coat system) | | | |
| 1 ct. | Macropoxy 646-100 Fast Cure Epoxy | 3.0-6.0 | (75-150) |
| 1-2 cts. | of recommended topcoat | | |
| **Steel:** | | | |
| 1 ct. | Recoatable Epoxy Primer | 4.0-6.0 | (100-150) |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| **Steel:** | | | |
| 1 ct. | Macropoxy 646-100 | 4.0-6.0 | |
| 1-2 cts. | Acrolon 218 Polyurethane | 3.0-6.0 | (75-150) |
| or | Hi-Solids Polyurethane | 3.0-5.0 | (75-125) |
| or | SherThane 2K Urethane | 2.0-4.0 | (50-100) |
| **Steel:** | | | |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| 1-2 cts. | Tile-Clad HS Epoxy | 2.5-4.0 | (63-100) |
| **Steel:** | | | |
| 1 ct. | Zinc Clad II Plus | 3.0-6.0 | (75-150) |
| 1 ct. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| 1-2 cts. | Acrolon 218 Polyurethane | 3.0-6.0 | (75-150) |
| **Steel:** | | | |
| 1 ct. | Zinc Clad III HS | 3.0-5.0 | (75-125) |
| or | Zinc Clad IV | 3.0-5.0 | (75-125) |
| 1 ct. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| 1-2 cts. | Hi-Solids Polyurethane-100 | 3.0-6.0 | (75-150) |
| **Aluminum:** | | | |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| **Galvanizing:** | | | |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |

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 | |
| Atmospheric: | SSPC-SP2/3 |
| Immersion: | SSPC-SP10/NACE 2, 2-3 mil (50-75 micron) profile |
| Aluminum: | SSPC-SP1 |
| Galvanizing: | SSPC-SP1 |
| 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, CSP 1-3 |

**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

Tint Part A with Maxitoners at 150% strength. Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.

Tinting is not recommended for immersion service.

## APPLICATION CONDITIONS

| | |
|---|---|
| Temperature: | 40°F (4.5°C) minimum, 140°F (60°C) maximum (air, surface, and material) |
| | 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 gallon (3.78L) and 5 gallon (18.9L) containers |
| Part B: | 1 gallon (3.78L) and 5 gallon (18.9L) containers |
| Weight: | 13.24 ± 0.2 lb/gal ; 1.6 Kg/L mixed, may vary by 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.

Protective & Marine Coatings

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|---|---|---|
| PART A | B58-620 | SERIES |
| PART B | B58V620 | HARDENER |

Revised: May 6, 2013

## 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, 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, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils / 50 microns). Prime any bare steel within 8 hours or before flash rusting occurs.

**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 (2-3 mils / 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.

**Aluminum**
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 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.

**Previously Painted Surfaces**
If in sound condition, clean the surface of all foreign material. Smooth, hard or glossy coatings and surfaces should be dulled by abrading the surface. Apply a test area, allowing paint to dry one week before testing adhesion. If adhesion is poor, or if this product attacks the previous finish, removal of the previous coating may be necessary. If paint is peeling or badly weathered, clean surface to sound substrate and treat as a new surface as above.

**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: | 40°F (4.5°C) minimum, 140°F (60°C) maximum<br>(air, surface, and material)<br>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 R7K111 or Oxsol 100

**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
Reduction.....As needed up to 10% by volume
Requires oil and moisture separators

**Brush**
Brush.....Nylon/Polyester or 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.



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Protective & Marine Coatings

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| | | |
|---|---|---|
| PART A | B58-620 | SERIES |
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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 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 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) | **7.0** | (175) | **13.5** | (338) |
| **Dry mils** (microns) | **5.0*** | (125) | **10.0*** | (250)* |
| **~Coverage sq ft/gal** ($m^2$/L) | **116** | (2.8) | **232** | (5.7) |
| Theoretical coverage **sq ft/gal** ($m^2$/L) @ 1 mil / 25 microns dft | **1168** | (28.6) | | |

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

*See Recommended Systems on reverse side. See Performance Tips section also.

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

| | @ 40°F/4.5°C | @ 77°F/25°C *50% RH* | @ 100°F/38°C |
|---|---|---|---|
| **To touch:** | 4-5 hours | 2 hours | 1.5 hours |
| **To handle:** | 48 hours | 8 hours | 4.5 hours |
| **To recoat:** | | | |
| **minimum:** | 48 hours | 8 hours | 4.5 hours |
| **maximum:** | 1 year | 1 year | 1 year |
| **Cure for** | | | |
| **service:** | 10 days | 7 days | 4 days |
| **immersion:** | 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.*

| | | | |
|---|---|---|---|
| **Pot Life:** | 10 hours | 4 hours | 2 hours |
| **Sweat-in-time:** | 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 Reducer R7K111 or Oxsol 100. Clean tools immediately after use with Reducer R7K111 or Oxsol 100. 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 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 R7K111 or Oxsol 100.

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.

Tinting is not recommended for immersion service.

Use only Mil White for immersion service.

Quik-Kick Epoxy Accelerator is acceptable for use. See data page 4.99 for details.

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

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

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

Acceptable for Concrete Floors.

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

### SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

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### WARRANTY

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