



Protective & Marine Coatings

MACROPOXY® 646N

PART A	B58A490	FCS 26515
PART A	B58Y490	RAL 1004
PART A	B58R490	RAL 3000
PART A	B58A491	RAL 9002
PART A	B58W490	RAL 9003
PART B	B58V490	HARDENER

Revised: February 4, 2022

PRODUCT INFORMATION

4.53N

PRODUCT DESCRIPTION

MACROPOXY 646N is a fast drying, polyamide epoxy designed to protect steel and concrete. It is self-priming and is for use as an intermediate and topcoat in multiple systems. This product meets specific design requirements for nuclear safety related qualification*. This product is quality manufactured to the requirements of 10 CFR 50 Appendix B and ANSI/ASME NQA-1.

*DBA Qualification for LOCA is NRC license specific to the facility

PRODUCT CHARACTERISTICS

Finish:	Semi-Gloss
Color:	Signal White RAL 9003, Safety Yellow RAL 1004, Safety Red RAL 3000, Light Gray FCS 26515
Volume Solids (Sv): (ASTM D 5201)	72% ± 2%, mixed
Weight Solids (Sw): (ASTM D 2369)	85% ± 3%, mixed
NOTE: Batch Sw are determined using ASTM D2369 for PIC/CoC reporting.	
VOC (EPA Method 24):	<250 g/L; 2.08 lb/gal, mixed
Dry Film Density: (calculated)	>100 lb/cu. ft. mixed
Mix Ratio:	1:1 by volume

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	3.1 (78)	15.3 (383)
Dry mils (microns)	2.2 (55)	11.0 (275)
~Coverage sq ft/gal (m ² /L)	105 (2.6)	524 (13.1)
Theoretical coverage sq ft/gal (m ² /L) @ 1 mil / 25 microns dft	1154 (28.8)	
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):

	@ 40°F/4.5°C	@ 77°F/25°C 50% RH	@ 100°F/38°C
To recoat:	48 hours	8 hours	4.5 hours
maximum:	1 year	1 year	1 year
Cure for:			
atmospheric:	10 days	7 days	4 days
immersion:	14 days	7 days	4 days
Pot Life:	4 hours		
Sweat-in-time:	30 minutes	30 minutes	15 minutes
If maximum recoat time is exceeded, abrade surface before recoating. Drying time is temperature, humidity, and film thickness dependent.			

Shelf Life:	36 months, unopened Store indoors at 40°F (4.5°C) to 110°F (43°C).
Flash Point:	91°F (33°C), TCC, mixed
Reducer/Clean Up¹:	VOC Restricted Areas (<250 g/L): use Reducer R7K111 or Oxsol 100

¹Other areas (<340 g/L): use Reducer R7K111, Oxsol 100, or Reducer R7K15 up to 10%. Choose a reducer that is compliant in your area. Confirm compliance with state and local air quality rules before use.

SHIPPING WEIGHT

B58W490:	53.08 lbs (24.08 kg) per 4-gallon carton 62.26 lbs (28.24 kg) per 5-gallon pail
B58V490:	57.61 lbs (26.13 kg) per 4-gallon carton 70.52 lbs (31.99 kg) per 5-gallon pail

RECOMMENDED USES

- Nuclear Power Plants
- DOE Nuclear Fuel Facilities
- Fabrication shops
- DOE Nuclear Weapons Facilities

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Always follow project specifications. Minimum surface prep is as follows:

Steel Substrate:

Shop: SSPC-SP6 1.5-3.0 mils (38-75 microns)
Maintenance: SSPC-SP2/3 or SP11/15 1.5-3.0 mils (38-75 microns)
Immersion: SSPC-SP10 2.0-3.0 mils (50-75 microns)

Concrete Substrate:

ASTM D4258 Surface Cleaning Concrete
ASTM D4259 Abrading Concrete
SSPC-SP13 or ICRI No. 310.2R CSP 2-3 Surface Preparation of Concrete

PERFORMANCE CHARACTERISTICS

Test Name	System	Results
Abrasion Resistance ASTM D4060	646N	120 mg loss
Adhesion ASTM D4541 ASTM D7234	646N	3,180 psi (steel); 482 psi (concrete)
Chemical Resistance ASTM D3912	646N	No Effect
Decontamination ASTM D4256	646N	99%
Direct Impact Resistance ASTM D2794	646/646	120 in. lb.
Effects of Gamma Radiation* ASTM D4082	646N	Pass
Salt Fog* ASTM B117	646N	2,000 hours
Simulated DBA ASTM D3911	646N Steel and Concrete	Pass
Slip Coefficient, RCSC	646N	Class A
Surface Burning ASTM E84/NFPA 255	646N	Flame Spread Index 5; Smoke Development Index 20 (at 10.0 mils or 250 microns)
Thermal Conductivity* ASTM E1530	646N	@ 100°F = 0.21 BTU/h ft °F; @ 200°F = 0.21 BTU/h ft °F

*Substrate: Steel



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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 Up¹ VOC Restricted Areas (<250 g/L); use Reducer R7K111 or Oxsol 100

¹Other areas (<340 g/L): use Reducer R7K111, Oxsol 100, or Reducer R7K15 up to 10%. Choose a reducer that is compliant in your area. Confirm compliance with state and local air quality rules before use.

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.....	As needed up to 10% by volume

Roller

Cover.....	3/8" woven with solvent resistant core
Reduction.....	As needed up to 10% by volume

Plural Component Spray...Acceptable

Consult your Sherwin-Williams Representative regarding Product Bulletin: "Application Guidelines for Macropoxy 646 & Macropoxy 646N Epoxies Utilizing Plural Component Equipment"

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

RECOMMENDED SYSTEMS

		Dry Film Thickness / ct.	
		Mils	(Microns)
Steel:			
1 ct.	Macropoxy 646N	2.0-10.0	(50-250)
or			
1 ct.	Macropoxy 646N	1.1-5.5	(28-138)
1 ct.	Macropoxy 646N	1.1-5.5	(28-138)
or			
1 ct.	Zinc Clad II N	2.1-5.0	(53-125)
1 ct.	Macropoxy 646N*	2.2-8.0	(55-200)

* As per WEC APP-GW-Z0-604

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

APPLICATION CONDITIONS

Temperature:	40°F (4.5°C) minimum, 120°F (49°C) maximum (air, surface) 40°F (4.5°C) minimum, 120°F (49°C) maximum (material) At least 5°F (2.8°C) above dew point
Relative humidity:	85% maximum

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:	12.9 ± 0.2 lb/gal ; 1.55 Kg/L

MIXING PROCEDURES

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.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Reducer R7K15. Clean tools immediately after use with Reducer R7K15. In California use Reducer R7K111. Follow manufacturer's safety recommendations when using any solvent.

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.

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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