

**City of Greenville Public Works Department
Bid Request**

Project:

Public Works Fuel Island Canopy Repair
1500 Beatty Street
Greenville, NC 27834

Scope of Work:

Provide labor and material to prep, paint and repair the existing fuel island canopy at Public Works.

Special Conditions:

Work must comply with all OSHA safety guidelines.

Contractor responsible for all needed paper work to obtain required permits. All permits must be posted prior to the commencement of work.

Contractor responsible for all work associated within the scope of work.

Staff is responsible for relocating essential items.

Mandatory pre-bid meeting & site visit on Tuesday, January 5, 2016 @ 2:00 PM.

Work Location:

Public Works
1500 Beatty Street
Greenville, NC 27834

Bid submittal deadline:

Tuesday, January 19, 2016 @ 2:00 pm

Public Works Administration Building
1500 Beatty Street
Greenville, NC 27834

Public Works Fuel Island Canopy Repair:

Date: _____

Contractor Name and Address:

Phone Number: _____

Base Bid Amount: \$ _____

Bid submitted by: _____

Signature: _____

Notes:

- 1. Bid will be considered valid for a period of 60 days after submittal**
- 2. City has the right to accept or reject any or all parts of the bids.**

Alternate #1: Prep and install urethane topcoat system to the concrete pad around the fuel pump islands:

ADD \$ _____

INVITATION FOR INFORMAL BID ON

PUBLIC WORKS FUEL ISLAND CANOPY REPAIR

INSTRUCTIONS TO BIDDERS

The person firm or corporation making a proposal shall be submitted in a sealed envelope to *Mike Watson, Building Facilities Coordinator*, at the Public Works Administrative offices located at 1500 Beatty Street, Greenville N.C., 27834, on or before the hour and day stated on the attached bid request form. The words *Bids Enclosed, Fuel Island Canopy Repair* and the name *Mike Watson* should appear on the outside of the sealed envelope. The estimate may also be mailed but must be received prior to the time and date stated on the attached bid request form.

All bids will be marked with the date and time they are received by reception staff. Bids will not be opened and read aloud. Bids will be opened and evaluated and a bid tabulation will be available upon request once the contract is awarded to the successful bidder.

The bidder shall insert the required responses and supply all the information as indicated on the Bid Form. The prices inserted shall be net and shall be the full cost including all factors whatsoever. Any bids not submitted on such forms provided will be considered unresponsive.

No bid may be changed or withdrawn after the time of the bid opening. Any modifications or withdrawals requested before this time shall be acceptable only when such request in writing is made to *Mike Watson, Building Facilities Coordinator*.

The City of Greenville reserves the right to reject any and all bids, to waive any formalities, and to accept the bid or any portion thereof that is deemed most advantageous to the City. Any bid submitted will be binding for 60 days after the of the bid opening.

The scope of work attached represents the minimum specification or description of work to be purchased or contracted. These requirements are not intended to prevent fair responses or to eliminate competition, but they are intended for the protection of each and every bidder to insure, if possible, that all bids submitted shall be upon a fair and comparable basis.

It is expressly understood by the bidders that written notice of award and/or receipt of purchase order will constitute agreement by the City to consummate the transaction and will serve together with the proposal, scope of work, and these instructions as the entire form of contract between the parties except in cases where formal contracts are warranted.

Bid shall be FOB, Greenville, N. C.

Each bidder shall affirm that no official or employee of the City of Greenville is directly or indirectly interested in this proposal for any reason of personal gain.

Minority and/or Women Business Enterprise (MWBE) Program:

It is the policy of the City of Greenville to provide minorities and women equal opportunity for participating in all aspects of the City's contracting and procurement programs, including but not limited to, construction projects, supplies and materials purchases, and professional and personal service contracts. In accordance with this policy, the City has adopted a Minority and Women Business Enterprise (M/WBE) Plan and subsequent program, outlining verifiable goals.

The City has established a 10% Minority Business Enterprise (MBE) and 6% Women Business Enterprise (WBE) goal for the participation of MWBE firms in supplying goods and services for the completion of this project. All firms submitting bids agree to utilize minority and women-owned firms whenever possible.

Questions regarding the City's MWBE Program should be directed to the MWBE Office at (252) 329-4862.

Equal Employment Opportunity Clause:

The City has adopted an Equal Employment Opportunity Clause, which is incorporated into all specifications, purchase orders, and contracts, whereby a vendor agrees not to discriminate against any employee or applicant for employment on the basis of race, color, religion, sex, national origin or ancestry. A copy of this clause may be obtained at the City Clerk's Office, City Hall, Greenville, NC. By submitting qualifications and/or proposals, the firm is attesting that they are an Equal Opportunity Employer.

Federal law (Rehabilitation Act and ADA) prohibits handicapped discrimination by all governmental units. By submitting a proposal, the vendor is attesting to its policy of nondiscrimination regarding the handicapped.

Sales taxes may be listed on the proposal, but as a separate item. No charge will be allowed for Federal Excise and Transportation tax from which the City is exempt.

New vendors must complete a City of Greenville vendor application.

Vendors must maintain workers compensation, general liability and vehicle insurance for duration of the project that comply with City of Greenville minimum limits.

Insurance certificates will be required if requested once contract is awarded.

The City of Greenville has adopted a Local Preference Policy, Resolution No. 056-13, and a Professional and other Services Policy, Resolution No. 057-13 that will pertain to this project. For more information please see the City of Greenville's webpage at www.greenvillenc.gov/financialservices/purchasingdivision.

If your firm is unable to bid for any reason, please send an email or letter of explanation.

A mandatory pre-bid meeting and site visit will be held on Tuesday, January 5, 2016 at 2:00 PM. Alternate site visits are scheduled for Monday, January 11, 2016 at 9:30 AM and on Tuesday, January 12, 2016 at 9:30 AM. Please call Mike Watson at 252-329-4921 to schedule a time.

Questions regarding any procedure for submission of a proposal for the Fuel Island Canopy Repair shall be directed by email to Mike Watson, Building Facilities Coordinator, @ mwatson@greenvillenc.gov. Questions shall be submitted by Thursday, January 14, 2015 by 10:00AM.

The pre-bid and site visits will be held at:

*Public Works Administrative Building
1500 Beatty Street
Greenville, NC 27834*

**Mike Watson
Building Facilities Coordinator
Public Works Department
City of Greenville, N. C. 27834
mwatson@greenvillenc.gov**

Public Works Fuel Island Canopy Repair

Scope of Work

Scope

Provide labor and material to pressure wash, prep and paint the steel columns, beams and edges of the fuel pump islands. The work will include the repairing of the damaged panels, installing a new gutter system, replacing the canopy fascia panels and upgrading the electrical wiring and conduit. The work will need to be coordinated with staff prior to the work starting. The operation of the fuel pumps will be ongoing while the work is completed.

Material/Installation

1. Pressure wash the entire canopy. See page 8 for more information.
2. Repair or cover any existing holes in the metal columns. Fill in holes with appropriate material and sand smooth. Cover larger holes with metal plates welded to the column. Sand smooth, clean and prime all repaired areas.
3. Remove all loose and flaking paint from the steel columns, beams and metal areas around the fuel pump islands and prepare for finish paint.
4. Use Sherwin Williams or approved equal. See Exhibit “C” for the paint and primer finish schedule and attachments. Color to be from standard manufacturer’s selections.
5. Upgrade all electrical connections associated with the canopy with new wiring, conduit, switches, etc. Reuse the existing light fixtures. All conduit shall be fire caulked.
6. Remove and replace the existing canopy fascia panels. Style is to match the existing. Color to be chosen from standard available selections.
7. Install a new gutter system at the canopy. Remove the existing trough and repair as needed. Install a new drainage trough tied into new metal down spouts. The water is to be directed away from the fuel pump islands.
8. Contractor will be responsible for all measurements.
9. Protect all pumps, equipment, concrete, etc. while the work is completed. If any area is damaged, then it shall be the responsibility of the contractor to repair or replace the damage.
10. The work will be done between the hours of 7:00 AM and 6:00 PM and/or weekends. All areas of work shall be cleaned up and any material will need to be out of the way so not to disrupt work during normal business hours. The operation of the pumps will be ongoing while the work is completed. Work shall be completed within 30 days from the Order to Proceed date.

Warranty

Provide a standard manufacturer’s warranty on all material and a minimum two (2) years labor warranty.

Alternate #1 – Urethane Topcoat System

Scope

Provide labor and material to prep the existing concrete pad area under the canopy and install a urethane topcoat system and primer. The installed urethane system will be saw-cut through and caulked with a polyurethane sealant by the contractor. The work will need to be coordinated with staff prior to the work starting. The operation of the fuel pumps will be ongoing while the work is completed.

Material/Installation

1. Prep the concrete pad by shot blasting to a CSP 3-5. See Page 8 for waste water information and see Exhibit “D” for more information from Sherwin Williams on shot blasting.
2. Once the concrete has been prepped and cleaned, install the primer as recommended by the manufacturer.
3. Install Fastop 12SL Urethane Cement Slurry by Sherwin Williams or approved equal.
4. Broadcast with clean silica sand to the manufacturer’s specifications.
5. Install 4090TC Fastop Coating seal coat from Sherwin Williams or approved equal.
6. Saw-cut all joints through the Fastop 12SL and caulk with Loxon 1K or 2K Polyurethane Sealant by Sherwin Williams or approved equal.
7. All stages of the work shall be installed per the manufacturer’s specifications. See Exhibit “D” for more information.
8. **NOTE:** Sherwin Williams only sells these products to trained and approved contractors that have experience with installing polymer flooring systems.
9. The color will be chosen from a range of available manufacturer’s colors.
10. Protect all pumps, equipment, concrete, etc. while the work is completed. If any area is damaged, then it shall be the responsibility of the contractor to repair or replace the damage.
11. The work will be done between the hours of 7:00 AM and 6:00 PM and/or weekends. All areas of work shall be cleaned up and any material will need to be out of the way so not to disrupt work during normal business hours. The operation of the pumps will be ongoing while the work is completed. Work shall be completed within 30 days from the Order to Proceed date.

Warranty

Provide a standard manufacturer’s warranty on all material and a minimum two (2) years labor warranty.

Waste Disposal / Wash Water Information

- 1. City of Greenville requires 100% recovery and waste disposal of any waste or waste water generated from the cleaning of the concrete and canopy surfaces**
- 2. No release of any water or waste water from the process is allowed into any sanitary or storm water drain.**
- 3. Water and/or waste water shall be contained with filtering booms so to collect oils, grease and debris**
- 4. The successful bidder is responsible for any and all fees associated with the waste disposal and must provide documentation that all waste was disposed of properly off site.**

Public Works Fuel Island Canopy Repair

Canopy Paint Schedule

Sherwin Williams is used as the base for information. Other manufacturers will be considered with prior approval.

Steel (Metal Columns)

Spot Prime: B50WZ0001 - Kem Kromik Universal Metal Primer Off White
Finish: B54W00151 - Pro Industrial Urethane Alkyd Enamel Extra White

Concrete/Cement (Island Edge)

Prime Coat: B58W00610 - Macropoxy 646 Fast Cure Epoxy Part A Mill White
Finish: B65W00311 - Hi-Solids Polyurethane Gloss (Part S) Extra White/Tint
Base Part S



**Protective
&
Marine
Coatings**

**KEM KROMIK®
UNIVERSAL METAL PRIMER**

B50NZ6 **BROWN**
B50WZ1 **OFF WHITE**
B50AZ6 **GRAY**

Revised January 16, 2015

PRODUCT INFORMATION

2.11

PRODUCT DESCRIPTION

KEM KROMIK UNIVERSAL METAL PRIMER is a rust inhibiting, low VOC, modified phenolic alkyd resin primer designed for use over iron and steel substrates. Can be used as a universal primer under high performance topcoats. Suitable as a barrier coat over conventional coatings which would normally be attacked by strong solvents in high performance coatings.

- High film build to protect sand blasted steel
- Corrosion resistant
- Can be topcoated with epoxies and urethanes
- Low temperature application

PRODUCT CHARACTERISTICS

Finish: Flat
Color: Brown (Red Oxide), Off White, Gray
Volume Solids: 53% ± 2%
Weight Solids: 73% ± 2%
VOC (EPA Method 24): <420 g/L, 3.5 lb/gal

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	6.0 (150)	8.0 (200)
Dry mils (microns)	3.0 (75)	4.0 (100)
~Coverage sq ft/gal (m²/L)	212 (5.2)	283 (7.0)
Theoretical coverage sq ft/gal (m²/L) @ 1 mil / 25 microns dft	848 (20.8)	

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):

	@ 40°F/4.5°C	@ 77°F/25°C 50% RH	@ 110°F/43°C
To touch:	2 hours	30 minutes	15 minutes
To handle:	2.5 hours	1 hour	20 minutes
To recoat:			
itself & alkyds	2.5 hours	1 hour	45 minutes
high performance/	36 hours	16 hours	16 hours
hot solvent topcoats			
To cure:	7 days	7 days	7 days

*Note: For maximum adhesion, acrylic topcoats require 48 - 72 hours drying of primer.
Drying time is temperature, humidity, and film thickness dependent.*

Shelf Life:	36 months, unopened Store indoors at 40°F (4.5°C) to 100°F (38°C).
Flash Point:	80°F (27°C), PMCC
Reducer:	Not recommended
Clean Up:	Xylene R2K4

RECOMMENDED USES

For use over prepared steel.

- Universal primer
- Shopcoat primer
- Barrier coating
- Maintenance primer
- Interior / exterior metal primer
- Structural steel
- Equipment / machinery
- Marine vessels
- Hand rails
- Conforms to AWWA D102, OCS #1
- Suitable for use in USDA inspected facilities
- Conforms to MPI #'s 69, 79, & 95

According to AISC, shop coat primers are intended for protection for only a short period of exposure in ordinary atmospheric conditions, and is considered a temporary and provisional coating.

Not recommended for immersion service or exposure to acids, alkalis, or strong solvents.

PERFORMANCE CHARACTERISTICS

Substrate*: Steel
Surface Preparation*: SSPC-SP6
System Tested*:
1 ct. Kem Kromik Universal @ 3.0 mils (75 microns) dft
*unless otherwise noted below

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load	250 mg loss
Adhesion	ASTM D4541	260 psi
Direct Impact Resistance	ASTM D2794	70 in. lbs.
Dry Heat Resistance	ASTM D2485	200°F (93°C)
Flexibility	ASTM D522, 180° bend, 1/4" mandrel	Passes
Moisture Condensation Resistance	ASTM D4585, 100°F (38°C), 500 hours	Good
Pencil Hardness	ASTM D3363	H
Salt Fog Resistance	ASTM B117, 500 hours	Good
Thermal Shock	ASTM D2246, 5 cycles	Passes

Provides performance comparable to products formulated to federal specifications: TT-P-664D.

www.sherwin-williams.com/protective

continued on back



**Protective
&
Marine
Coatings**

KEM KROMIK® UNIVERSAL METAL PRIMER

B50NZ6 **BROWN**
B50WZ1 **OFF WHITE**
B50AZ6 **GRAY**

Revised January 16, 2015

PRODUCT INFORMATION

2.11

RECOMMENDED SYSTEMS

		Dry Film Thickness / ct.	
		Mils	(Microns)
Steel, Alkyd Topcoat:			
1 ct.	Kem Kromik Universal Metal Primer	3.0-4.0	(75-100)
1-2 cts.	Industrial Enamel HS	2.0-4.0	(50-100)
or	WB Industrial Enamel	1.5-3.0	(40-75)
or	Steel Spec Fast Dry Alkyd	3.0-5.0	(75-125)
Steel, Aluminum Finish:			
1 ct.	Kem Kromik Universal Metal Primer	3.0-4.0	(75-100)
1-2 cts.	Silver-Brite Aluminum	1.0-1.5	(25-40)
Steel, Acrylic Topcoat:			
1 ct.	Kem Kromik Universal Metal Primer	3.0-4.0	(75-100)
1-2 cts.	Pro Industrial DTM Acrylic Coating	2.5-4.0	(63-100)
or	Sher-Cryl HPA	2.5-4.0	(63-100)
Steel, Epoxy Topcoat:			
1 ct.	Kem Kromik Universal Metal Primer	3.0-4.0	(75-100)
1-2 cts.	Tile-Clad HS Epoxy	2.5-4.0	(63-100)
Steel, Polyurethane Topcoat:			
1 ct.	Kem Kromik Universal Metal Primer	3.0-4.0	(75-100)
1-2 cts.	Hi-Solids Polyurethane	3.0-4.0	(75-100)
or	Polyon HP Polyurethane	2.0-3.0	(50-75)
Steel, Silicone Alkyd Topcoat:			
1 ct.	Kem Kromik Universal Metal Primer	3.0-4.0	(75-100)
1-2 cts.	Steel Master 9500	2.5-4.0	(63-100)
Steel, Water Based Epoxy Topcoat:			
1 ct.	Kem Kromik Universal Metal Primer	3.0-4.0	(75-100)
1-2 cts.	Water Based Catalyzed Epoxy	2.5-4.0	(63-100)
or	Waterbased Tile Clad Epoxy	2.0-4.0	(50-100)

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: SSPC-SP2

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

TINTING

Do not tint.

APPLICATION CONDITIONS

Temperature: 40°F (4.5°C) minimum, 120°F (49°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: 1 gallon (3.78L) and 5 gallon (18.9L) containers

Weight: 12.5 ± 0.35 lb/gal 1.5 Kg/L

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.

www.sherwin-williams.com/protective



PRO INDUSTRIAL™

113.11

URETHANE ALKYD ENAMEL B54-150 SERIES

As of 03/01/2013, Complies with:		
OTC	Yes	LEED® 09 CI No
SCAQM	No	LEED® 09 NC No
CARB	No	LEED® 09 CS No
CARB SCM 2007	No	LEED® 09 S No
MPD Spec #	No	NGRS No

CHARACTERISTICS

Pro Industrial Urethane Alkyd Enamel is a high solids, high gloss coating intended for interior/exterior use in industrial environments. It is easy to brush, roll or spray. Provides performance comparable to silicone alkyds.

- Modified with urethane resin for increased exterior durability
- Resistant to chipping and flaking
- Resists premature yellowing
- Abrasion resistant
- Appropriate for interior and exterior applications
- Very good gloss and color retention
- Excellent application characteristics
- Suitable for use in USDA inspected facilities

Color: Most Colors

Recommended Spread Rate per coat:

Wet mils: 3.5 - 7.0

Dry mils: 2.0 - 4.0

Coverage: 231 - 462 sq ft/gal approximate

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

Drying Time @ 4.0 mils wet 50% RH:

45°F 77°F 120°F

To touch: 4 hrs 2½ hrs 30 min

Tack free: 10 hrs 4 hrs 2 hrs

To recoat: 36 hrs 18 hrs 8 hrs

To cure: 7 days 7 days 5 days

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

Finish: Gloss

Flash Point: 103°F, PMCC

Shelf Life: 36 months, unopened

Store indoors at 40°F to 100°F.

Tinting with Blend-A-Color or MaxiToner:

Base oz/gal Strength

Extra White 0-6 100%

Ultradeep 4-12 100%

B54W00151 (may vary by color)

VOC (EPA Method 24): Unreduced:

<330g/L; <2.75 lb/gal

Volume Solids: 58% ± 2%

Weight Solids: 72% ± 2%

Weight per Gallon: 9.8 lb

RECOMMENDED SYSTEMS

Steel (alkyd primer):

1 ct. Kem Bond HS Primer
1-2 cts. Pro Industrial Urethane Alkyd Enamel

Aluminum:

1 ct. DTM Wash Primer
1-2 cts. Pro Industrial Urethane Alkyd Enamel

Galvanized Metal:

1 ct. Galvite HS
1-2 cts. Pro Industrial Urethane Alkyd Enamel

Concrete Block:

1 ct. Heavy Duty Block Filler
1-2 cts. Pro Industrial Urethane Alkyd Enamel

Interior Plaster and Poured Concrete:

1 ct. Loxon Masonry Primer
1-2 cts. Pro Industrial Urethane Alkyd Enamel

Drywall:

1 ct. ProMar 200 Latex Primer
1-2 cts. Pro Industrial Urethane Alkyd Enamel

Wood Floors (Foot Traffic):

1-2 cts. Pro Industrial Urethane Alkyd Enamel

System Tested: (unless otherwise indicated)

Substrate: Steel
Surface Preparation: SSPC-SP10
1 ct. Kem Bond HS Primer
1 ct. Pro Industrial Urethane Alkyd Enamel

Abrasion

Method: ASTM D4060, C517 wheel, 1000 cycles, 1 kg load
Result: 175 mg loss

Flexibility

Method: ASTM D522, 180° bend, 1/4" mandrel
Result: Passes

Adhesion

Method: ASTM D4541
Result: 392 psi

Humidity Resistance

Method: ASTM D4548, 500 hours
Result: Rating 10 per ASTM D610 for Rusting; Rating 10 per ASTM D714 for Blistering

Direct Impact Resistance

Method: ASTM D2794
Result: 60 in. lbs.

Pencil Hardness

Method: ASTM D3363
Result: B

Dry Heat Resistance

Method: ASTM D2485
Result: 200°F (93°C) (discolors)

Salt Fog Resistance

Method: ASTM B117, 500 hours
Result: Rating 10 per ASTM D610 for Rusting; Rating 10 per ASTM D714 for Blistering

**PRO INDUSTRIAL™
URETHANE ALKYD ENAMEL**



<u>SURFACE PREPARATION</u>	<u>APPLICATION</u>
<p>WARNING! Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.</p> <p>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.</p> <p>Iron & Steel Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Hand Tool Clean per SSPC-SP2. 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.</p> <p>Aluminum Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1. Primer required.</p> <p>Galvanized Steel Allow to weather a minimum of six months prior to coating. Solvent Clean per SSPC-SP1. 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. Primer required. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned.</p> <p>Masonry and Concrete 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 AmorSeal Crack Filler. Weathered masonry and soft or porous cement board must be brush blasted or power tool cleaned to remove loosely adhering contamination and to get to a hard, firm surface. Laitance must be removed. Brick must be allowed to weather for one year prior to surface preparation and painting. Primer required.</p> <p>Wood Surface must be clean, dry, and sound. Paint as soon as possible. No painting should be done immediately after a rain or during foggy weather. Knots and pitch streaks must be scraped, sanded and spot primed. All nail holes or small openings must be properly caulked. Sand to remove any loose or deteriorated surface wood and to obtain a proper surface profile. Self priming.</p> <p>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.</p>	<p>Refer to the MSDS before using</p> <p>Temperature: 40°F minimum 120°F maximum (air, surface, and material) At least 5°F above dew point</p> <p>Relative humidity: 85% maximum</p> <p>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 compatible with the existing environmental and application conditions.</p> <p>Reducer/Clean Up Mineral Spirits, R1K4* or Xylene, R2K4</p> <p>Airless Spray Pressure 1800 psi minimum Hose 3/8" ID Tip017" - .019" Filter 60 - 100 mesh Reduction As needed up to 10% by volume</p> <p>Conventional Spray Gun Binks 95 Fluid Nozzle 66 Air Nozzle 63PB Atomization Pressure 50 psi Fluid Pressure 20-25 psi Reduction As needed up to 10% by volume</p> <p>Brush Brush Nylon/polyester or natural bristle Reduction As needed up to 10% by volume</p> <p>Roller Cover 1/4 - 3/8" lambswool or synthetic cover Reduction As needed up to 10% by volume</p> <p>* To maintain VOC compliance of 340 g/l, only a 2% reduction of Mineral Spirits, R1K4 is allowed.</p> <p style="text-align: center;"><u>CLEANUP INFORMATION</u></p> <p>Clean spills, spatters, and tools immediately after use with mineral spirits. Follow manufacturer's safety recommendations when using mineral spirits.</p>
<p><small>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. 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.</small></p>	



Protective & Marine Coatings

MACROPOXY® 646 FAST CURE EPOXY

PART A B58-600 SERIES
PART B B58V600 HARDENER

Revised: March 9, 2015

PRODUCT INFORMATION

4.53

PRODUCT DESCRIPTION

MACROPOXY 646 FAST CURE EPOXY is a high solids, 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
- Low odor
- Outstanding application properties
- Meets Class A requirements for Slip Coefficient, 0.36 @ 6 mils / 150 microns dft (Mill White only)
- Chemical resistant
- Abrasion resistant

PRODUCT CHARACTERISTICS

Finish:	Semi-Gloss
Color:	Mill White, Black and a wide range of colors available through tinting
Volume Solids:	72% ± 2%, mixed, Mill White
Weight Solids:	85% ± 2%, mixed, Mill White
VOC (EPA Method 24): mixed	Unreduced: <250 g/L; 2.08 lb/gal Reduced 10%: <300 g/L; 2.50 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	1152 (28.2)	

*May be applied at 3.0-10.0 mils (75-250 microns) dft as an intermediate coat in a multi-coat system. Refer to Recommended Systems (page 2). See Performance Tips section also.

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):

	@ 35°F/1.7°C	@ 77°F/25°C	@ 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
To cure:			
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. Paint temperature must be at least 40°F (4.5°C) minimum.

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

When used as an intermediate coat as part of a multi-coat system:

Drying Schedule @ 5.0 mils wet (125 microns):

	@ 35°F/1.7°C	@ 77°F/25°C	@ 100°F/38°C
To touch:	3 hours	1 hour	1 hour
To handle:	48 hours	4 hours	2 hours
To recoat:			
minimum:	16 hours	4 hours	2 hours
maximum:	1 year	1 year	1 year

PRODUCT CHARACTERISTICS (CONT'D)

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 Up:	Reducer, R7K15
In California:	Reducer R7K111 or Oxsol 100

PERFORMANCE CHARACTERISTICS

Substrate*:	Steel	
Surface Preparation*:	SSPC-SP10/INACE 2	
System Tested*:	1 ct. Macropoxy 646 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 per rusting
Nuclear Decontamination	ASTM D4256/ANSI N 5.12	99% Water Wash; 95% Overall
Direct Impact Resistance ²	ASTM D2794	120 in. lb.
Dry Heat Resistance	ASTM D2485	250°F (121°C)
Exterior Durability	1 year at 45° South	Excellent, chalks
Flexibility	ASTM D522, 180° bend, 3/4" mandrel	Passes
Fuel Contribution	NFPA 259	5764 btu/lb
Humidity Resistance	ASTM D4585, 6000 hours	No blistering, cracking, or rusting
Immersion	1 year fresh and salt water	Passes, no rusting, blistering, or loss of adhesion
Radiation Tolerance	ASTM D4082 / ANSI 5.12	Pass at 21 mils (525 microns)
Pencil Hardness	ASTM D3363	3H
Salt Fog Resistance ⁴	ASTM B117, 6,500 hours	Rating 10 per ASTM D610 for rusting; Rating 9 per ASTM D1654 for corrosion
Slip Coefficient, Mill White ⁵	AISC Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts	Class A, 0.36
Surface Burning	ASTM E84/NFPA 255	Flame Spread Index 20; Smoke Development Index 35 (at 18 mils or 450 microns)
Water Vapor Permeance	ASTM D1653, Method B	1.16 US perms

Epoxy coatings may darken or discolor following application and curing. *Refer to Slip Certification document

Footnotes:
¹ Zinc Clad II Plus Primer
² Two coats of Macropoxy 646 Fast Cure Epoxy

DISCLAIMER

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**Protective
&
Marine
Coatings**

**MACROPOXY® 646
FAST CURE EPOXY**

PART A B58-600 SERIES
PART B B58V600 HARDENER

Revised: March 9, 2015

PRODUCT INFORMATION

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RECOMMENDED USES

- Marine applications
- Fabrication shops
- Pulp and paper mills
- Power plants
- Offshore platforms
- Nuclear Power Plants
- Nuclear fabrication shops
- Mill White and Black are acceptable for immersion use for salt water and fresh water, not acceptable for potable water
- Suitable for use in USDA inspected facilities
- Acceptable for use in Canadian Food Processing facilities, categories: D1, D2, D3 (Confirm acceptance of specific part numbers/texts with your SW Sales Representative)
- Conforms to AWWA D102 OCS #5
- Conforms to MPI # 108
- 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.
- Suitable for use in the Mining & Minerals Industry

RECOMMENDED SYSTEMS

	Dry Film Thickness / ct	
	Mils	(Microns)
Immersion and atmospheric:		
Steel:		
2 cts. Macropoxy 646 Fast Cure Epoxy	5.0-10.0	(125-250)
Concrete/Masonry, smooth:		
2 cts. Macropoxy 646 Fast Cure Epoxy	5.0-10.0	(125-250)
Concrete Block:		
1 ct. Kem Coat-Coat HS Epoxy	10.0-20.0	(250-500)
<i>Filler/Sealer as needed to fill voids and provide a continuous substrate.</i>		
2 cts. Macropoxy 646 Fast Cure Epoxy	5.0-10.0	(125-250)
Atmospheric:		
<i>(Shop applied system, new construction, AWWA D102, can also be used at 3 mils, 75 microns minimum dft when used as an intermediate coat as part of a multi-coat system)</i>		
1 ct. Macropoxy 646 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 Fast Cure Epoxy	5.0-10.0	(125-250)
Steel:		
1 ct. Macropoxy 646 Fast Cure Epoxy	5.0-10.0	(125-250)
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)
or Hydrogloss	2.0-4.0	(50-100)
Steel:		
2 cts. Macropoxy 646 Fast Cure Epoxy	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	2.0-4.0	(50-100)
1 ct. Macropoxy 646 Fast Cure Epoxy	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 Fast Cure Epoxy	3.0-10.0	(75-250)
1-2 cts. Acrolon 218 Polyurethane	3.0-6.0	(75-150)
Aluminum:		
2 cts. Macropoxy 646 Fast Cure Epoxy	5.0-10.0	(125-250)
Galvanizing:		
2 cts. Macropoxy 646 Fast Cure Epoxy	5.0-10.0	(125-250)
FIRETEX ONLY:		
Steel & Galvanized Substrates being primed for FIRETEX only:		
1 ct. Macropoxy 646 Fast Cure Epoxy	2.0-5.0	(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:

- Iron & Steel
 - Atmospheric: SSPC-SP2/3
 - Immersion: SSPC-SP10/NACE 2, 2-3 mil (50-75 micron) profile
 - Aluminum: SSPC-SP1
 - Galvanizing: SSPC-SP1; See Surface Preparations section on page 3 for application of FIRETEX Intumescent coating systems
- Concrete & Masonry
 - Atmospheric: SSPC-SP13/NACE 6, or ICRI No. 310.2R, CSP 1-3
 - Immersion: SSPC-SP13/NACE 6-4.3.1 or 4.3.2, or ICRI No. 310.2R, CSP 2-4

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

TINTING

Tint Part A with Maxioners 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: 35°F (1.7°C) minimum, 120°F (49°C) maximum (air and surface)
40°F (4.5°C) minimum, 120°F (49°C) maximum (material)
At least 5°F (2.8°C) above dew point
85% maximum

Relative humidity:

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: 12.9 ± 0.2 lb/gal ; 1.55 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.

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**Protective
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Coatings**

HI-SOLIDS POLYURETHANE

PART S B65-300 GLOSS SERIES
 PART S B65-350 SEMI-GLOSS SERIES
 PART S B65WW305 MR, WHITE TINT BASE (GLOSS)
 PART T B60V30 HARDENER

Revised: June 1, 2015

PRODUCT INFORMATION

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PRODUCT DESCRIPTION

HI-SOLIDS POLYURETHANE is a two-component, low VOC, aliphatic, acrylic polyurethane resin coating. It is designed for high performance protection with outstanding exterior gloss and color retention.

- Good/excellent resistance to corrosion and weathering
- Outstanding color and gloss retention
- Chemical resistant
- Part of a system tested for nuclear irradiation and decontamination, Level II
- Resists film attack by mildew (MR White only)
- Outstanding application properties

PRODUCT CHARACTERISTICS

Finish: High Gloss or Semi-Gloss
Color: Wide range of colors possible
Volume Solids: 65% ± 2%, mixed, may vary by color
Weight Solids: 77% ± 2%, mixed, may vary by color
VOC (EPA Method 24): Unreduced: <340g/L; 2.80 lb/gal mixed
 Reduced 15%: <370 g/L; 3.08 lb/gal
 May vary by color
Mix Ratio: 4:1 by volume

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	4.5 (112)	8.0 (200)
Dry mils (microns)	3.0 (75)	5.0 (125)
~Coverage sq ft/gal (m ² /L)	208 (5.1)	347 (8.5)
Theoretical coverage sq ft/gal (m ² /L) @ 1 mil / 25 microns dft	1040 (25.5)	

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

Drying Schedule @ 4.5 mils wet (112 microns):

	@ 40°F/4.5°C	@ 77°F/25°C	@ 120°F/49°C
		50% RH	
To touch:	4 hours	2 hours	1 hour
To handle:	16 hours	8 hours	5 hours
To recoat:			
minimum	24 hours	18 hours	10 hours
maximum	14 days	14 days	14 days
To cure:	14 days	10 days	7 days
Pot Life:	8 hours	4 hours	2 hours
Sweat-in-Time:	None required		

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

Shelf Life: Part S - 36 months, unopened
 Part T - 24 months, unopened
 Store indoors at 40°F (4.5°C) to 100°F (38°C).
Flash Point: 80°F (27°C), PMCC, mixed
Reducer/Clean Up:
 Below 80°F (27°C): Reducer #69, R7K69 or R7K111
 Above 80°F (27°C): Reducer #58, R7K58 or R6K32

RECOMMENDED USES

- For use over prepared substrates in industrial environments
- Heavy duty interior and exterior structural coating
- A chemical and abrasion resistant equipment and machinery finish
- A gloss and color retentive heavy duty maintenance coating for use in "high visibility" areas
- Exterior surfaces of steel tanks
- Chemical processing equipment
- Marine & Offshore Applications
- Resists film attack by mildew (MR White only)
- Suitable for use in USDA inspected facilities
- Acceptable for use in Canadian Food Processing facilities categories: D1, D3 (Confirm acceptance of specific part numbers/rexes with your SW Sales Representative)
- Conforms to AWWA D102 OCS #5 & #6.
- Acceptable for use in high performance architectural applications
- As topcoat for NEPCOAT System A
- Over FIRETEX hydrocarbon systems

PERFORMANCE CHARACTERISTICS

Substrate*: Steel

Surface Preparation*: SSPC-SP6/NACE 3

System Tested*:

- 1 ct. Recoatable Epoxy Primer @ 4.0 mils (100 microns) dft
 - 1 ct. Hi-Solids Polyurethane Gloss @ 3.0 mils (75 microns) dft
- *unless otherwise noted below

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load	87.1 mg loss
Adhesion	ASTM D4541	1050 psi
Corrosion Weathering ¹	ASTM D5894, 21 cycles, 7056 hours	Rating 10 per ASTM D714 for blistering; Rating 9 per ASTM D610 for rusting
Direct Impact Resistance	ASTM D2794	>28 in. lbs.
Dry Heat Resistance	ASTM D2485	200°F (93°C)
Flexibility	ASTM D522, 180° bend, 1/8" mandrel	Passes
Moisture Condensation Resistance	ASTM D4585, 100°F (38°C), 1000 hours	No rusting, blistering, or delamination
Pencil Hardness	ASTM D3363	F
Salt Fog Resistance ¹	ASTM B117, 9000 hours	Rating 10 per ASTM D714 for blistering; Rating 9 per ASTM D610 for rusting
Surface Burning	ASTM E84	Flame Spread Index 0; Smoke Development Index 0 (at 3.5 mils or 88 microns)
Thermal Shock	ASTM D2246, 15 cycles	Excellent

Meets the requirements of SSPC Paint No. 36, Level 3 for white and light colors. Dark colors may require a clear coat.

Footnotes:

¹ Primer: Zinc Clad II Plus; Intermediate - Recoatable Epoxy Primer

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**Protective
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HI-SOLIDS POLYURETHANE

PART S B65-300 GLOSS SERIES
 PART S B65-350 SEMI-GLOSS SERIES
 PART S B65WW305 MR, WHITE TINT BASE (GLOSS)
 PART T B60V30 HARDENER

Revised: June 1, 2015

PRODUCT INFORMATION

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RECOMMENDED SYSTEMS

	Dry Film Thickness / ct.	
	Mils	(Microns)
Steel: Epoxy Primer		
1 ct. Recoatable Epoxy Primer	4.0-6.0	(100-150)
1-2 cts. Hi-Solids Polyurethane	3.0-5.0	(75-125)
Steel: Epoxy Primer		
1 ct. Dura-Plate 235	4.0-8.0	(100-200)
1-2 cts. Hi-Solids Polyurethane	3.0-5.0	(75-125)
Steel: Zinc Rich Primer		
1 ct. Zinc Clad II Plus	2.0-4.0	(50-100)
1 ct. Macropoxy 646	5.0-10.0	(125-250)
1-2 cts. Hi-Solids Polyurethane	3.0-5.0	(75-125)
Steel: Epoxy Mastic Primer		
1 ct. Macropoxy 646	5.0-10.0	(125-250)
1-2 cts. Hi-Solids Polyurethane	3.0-5.0	(75-125)
Steel: Universal Primer		
1 ct. Kem Bond HS Metal	2.0-5.0	(50-125)
1-2 cts. Hi-Solids Polyurethane	3.0-5.0	(75-125)
Steel: NEPCOAT		
1 ct. Zinc Clad DOT	2.0-4.0	(50-100)
1 ct. Steel Spec Epoxy Intermediate	3.0-6.0	(75-150)
1 ct. Hi-Solids Polyurethane	3.0-5.0	(75-125)
Aluminum:		
1 ct. DTM Wash Primer	0.7-1.3	(18-32)
1-2 cts. Hi-Solids Polyurethane	3.0-5.0	(75-125)
Concrete:		
1 ct. Kem Cati-Coat Epoxy HS Filler/Sealer	10.0-15.0	(250-375)
1-2 cts. Hi-Solids Polyurethane	3.0-5.0	(75-125)
Galvanized Metal:		
1 ct. Recoatable Epoxy Primer	4.0-6.0	(100-150)
1-2 cts. Hi-Solids Polyurethane	3.0-5.0	(75-125)

FIRETEX ONLY:

Finish Coat for FIRETEX Hydrocarbon Systems:

1 ct. Hi-Solids Polyurethane*

*Consult FIRETEX PFP Specialist for recommended dft range

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

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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.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

* Iron & Steel: SSPC-SP6/NACE 3, 2 mil (50 micron) profile

* Aluminum: SSPC-SP1

* Galvanizing: SSPC-SP1

* Concrete & Masonry: SSPC-SP13/NACE 6, or ICRI No. 310.2R, CSP 1-3

* Primer Required

Surface Preparation Standards

Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS056500	SSPC NACE
White Metal	Sa 3	Sa 3	SP 5 1
Near White Metal	Sa 2.5	Sa 2.5	SP 10 3
Commercial Blast	Sa 2	Sa 2	SP 6 3
Brush-Off Blast	Sa 1	Sa 1	SP 7 4
Hand Tool Cleaning	St 2	C St 2	SP 2 -
Pitted & Rusted	St 3	C St 3	SP 3 -
Power Tool Cleaning	St 3	D St 3	SP 3 -
Pitted & Rusted	St 3	D St 3	SP 3 -

TINTING

Tint with Maxitoner Colorants only into Part S. Extra White tints at 200% tint strength. Ultradeep tints at 150% tint strength. Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.

APPLICATION CONDITIONS

Temperature: 35°F (1.7°C) minimum
 120°F (49°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 S: 1 gallon (3.78L) and 4 gallon (15.1L) kits
 Part T: quarts (0.94L) and gallons (3.78L)

Weight:
 10.7 ± 0.2 lb/gal ; 1.28 Kg/L
 mixed, may vary with color

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

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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.

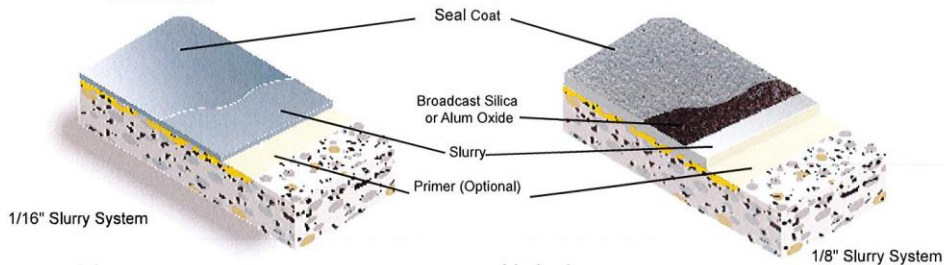
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Alternate #1 Information



FasTop™ 12SL Self-Leveling Urethane Slurry System

General Polymers FasTop 12SL SELF-LEVELING URETHANE SLURRY SYSTEM is a self-leveling slurry to be applied at 1/16" smooth finish or broadcast with aggregate to yield 1/8" with a non-skid finish. FasTop 12SL can be applied with a 3/8" x 3/8" notched squeegee or notched trowel, or screed rake. FasTop 12SL is designed for light to moderate traffic and abuse, while still providing the many benefits of a urethane concrete system. For heavier abuse or traffic see other FasTop 12 Systems. It is designed to protect concrete and steel substrates from thermal shock, impact, corrosion, and chemical attack.



Advantages

- Can be applied to "green" concrete
- Rapid cure and hardness development
- Water based
- Hot cooking oil and steam resistance
- Low temperature cure
- Will not lose bond due to thermal shock
- Impact resistant
- Moisture Resistant
- Maintains bond with vapor emissions up to 8 lbs.* must be minimum 1/8" system if coating with a non-breathing sealer, 90% RH
- Acceptable for use in USDA inspected facilities
- Resistant to:

28 Day Exposure @ 72°F		Result
		NE= No Effect
Alcohol		NE
Ethylene Glycol		NE
Fats, Oils & Sugars		NE
Gasoline, Diesel & Kerosine		NE
Hydrochloric Acid (<35%)		NE
Lactic Acid (Milk)		NE
Mineral Oils		NE
Most Organic Solvents		NE
Muriatic Acid		NE
Nitric Acid (<10%)		NE
Nitric Acid (<30%)	Slight Softening	
PM Acetate		NE
Phosphoric Acid (<50%)		NE
Potassium Hydroxide (<50%)		NE
Sodium Hydroxide (<50%)		NE
Sulfuric Acid (<50%)	Slight Gloss Loss	
Water		NE
Xylene		NE

Uses

- Warehouses
- Aircraft Hangars
- Manufacturing Flooring
- Garages

Limitations

- Protect material from freezing

Typical Physical Properties

Color	Red, Light Gray or Dark Gray
Decorative Upgrade:	Selected Ceramic Carpet Blends
Cure Time Recoat	12 hours
	6-8 hours
	10-12 hours
	20-30 mgs lost
Abrasion Resistance	
ASTM D 4060, CS-17 Wheel, 1,000 cycles	
Hardness, Shore D	75
ASTM D 2240	
Tensile Strength	550-600 psi
ASTM C 307	
Compressive Strength	5,000 psi
ASTM C 579	
Flexural Strength	3,700 psi
ASTM C 580	
Adhesion	300 psi
ACI 503R	concrete failure
Impact Resistance	Withstands 16 ft lbs
MIL-D-3134, Sec.4.7.3	without cracking,
	delamination
	or chipping
Flammability	Self-Extinguishing
	over concrete
Critical Radiant Flux	>1.0
ASTM E 648	
Smoke Density	287-346
ASTM E 662	
Coefficient of Friction	>0.80
ASTM D 2047	
Service Temperature at 3/16"	-50°F - 300°F
Shrinkage	Nil
Water Absorption	Nil

Installation

General Polymers materials shall only be installed by approved contractors. The following information is to be used as a guideline for the installation of the **FasTop 12SL SELF-LEVELING URETHANE SLURRY SYSTEM**. Contact the Technical Service Department for assistance prior to application.

Surface Preparation - General

General Polymers systems can be applied to a variety of substrates, if the substrate is properly prepared. Preparation of surfaces other than concrete will depend on the type of substrate, such as wood, concrete block, quarry tile, etc. Should there be any questions regarding a specific substrate or condition, please contact the Technical Service Department prior to starting the project. Refer to Surface Preparation (Form G-1).

Surface Preparation - Concrete

Concrete surfaces shall be abrasive blasted to remove all surface contaminants and laitance. The prepared concrete shall have a surface profile equal to CSP 3-4. Refer to Form G-1. Consult the Technical Service Department if oil or grease is present.

After initial preparation has occurred, inspect the concrete for bug holes, voids, fins and other imperfections. Protrusions shall be ground smooth while voids shall be filled with a General Polymers system filler. For recommendations, consult the Technical Service Department.

Limitations

The substrate must be structurally sound, cleaned of any foreign matter that will inhibit adhesion.

Do not apply in temperatures below 40°F or above 85°F or when relative humidity is greater than 85%. If substrate is not concrete or metal as described in Surface Preparation (Form G-1) then do not apply. Call Technical Service Department for recommendation. Working time is reduced with air movement and high humidity.

When installing FasTop 12SL, if encountering concrete outgassing, please discontinue installation and apply 3477 Epoxy Water Emulsion Primer / Sealer. Allow to dry until tack free and proceed with the FasTop 12SL installation.

- Do not featheredge.
- Do not mix partial units.
- Do not hand mix. Do not let mixed material sit in a bucket, even a 2-3 minute delay in pouring will reduce working time.
- Allow FasTop 12S/SL to cure a minimum of 12 hrs prior to optional topcoat(s) other than GP4090TC
- If patching, sloping, filling joints, etc. with any FasTop materials, allow the repair material to cure for a minimum of 8 hours before covering with 12S or 12SL.
- Do not apply to cracked or unsound substrates.
- Do not install outside, call Technical Service Department.

Full chemical resistance is achieved after a seven (7) day cure. Consult the Technical Service Department for specific chemical resistance.

Temperature

Throughout the application process, substrate temperature should be 50°F – 90°F. Substrate temperature must be at least 5°F above the dew point. Applications on concrete substrate should occur while temperature is falling to lessen offgassing. The material should not be applied in direct sunlight, if possible. Protect material from freezing prior to installation.

Application Information – Surface Prep Profile CSP 3-4

VOC MIXED		MATERIAL	MIX RATIO	THEORETICAL COVERAGE PER COAT CONCRETE	PACKAGING
<200 g/L	Optional Primer for outgassing	3477	2:1	250 sq. ft. / gal	3 or 15 gals
<50 g/L 0	Slurry 1/16" (Optional)	4080 5035	Pre-measured unit 35 lbs	60-65 sq. ft. / unit 35 lbs.	1.8 gals 35 lbs.
<50 g/L 0 0	Slurry 1/8" Broadcast Standard Dry Silica Sand 20-40 mesh	4080 5035 5310-8	Pre-measured unit 35 lbs To Excess	60-65 sq. ft. / unit 35 lbs. 400 lbs / 1,000 sq.ft.	1.8 gals 35 lbs. 50 lbs.
<50 g/L 0	Seal Coat	4090TC 5095	Pre-measured A and B components Plus 8 lbs aggregate (GP5095) TC = 1.25 gallons per kit	80-100 sq. ft. / unit	0.9 gal 8 lbs.

Primer

Mixing and Application

1. Premix 3477A (resin) and 3477B (hardener) separately, using a low speed drill and Jiffy blade. Mix for one minute and until uniform, exercising caution not to whip air into the materials.

2. Add 2 parts 3477A (resin) to 1 part 3477B (hardener) by volume. Mix with low speed drill and Jiffy blade for three minutes and until uniform. DO NOT mix more material than can be used within 4 hours. Apply material with a short nap roller at a spread rate of 250 sq. ft. per gallon.

DO NOT ALLOW TO PUDDLE. Any uneven or textured surfaces will require more material than an even surface.

Slurry @ 1/16"

Mixing and Application

DO NOT PREMIX 4080 PART B HARDENER. OVER EXPOSURE TO AIR EFFECTS PHYSICAL PROPERTIES

1. Add 4080A (resin) to 4080B (hardener) and mix with low speed drill and Jiffy mixer until uniform.

2. Pour 35 lbs. 5035 aggregate and 1 pre-measured unit (1 gal Part A : short-filled gal Part B) until no lumps remain. Immediately pour mixed material onto the substrate and pull out using a 3/8" x 3/8" notched squeegee or notched trowel, or screed rake. Place all material within 15 minutes. Back roll with a loop roller to assist leveling. Allow material to self-level (2-5 minutes).

3. Allow to cure (Cure times vary depending on environmental conditions).

4. Apply topcoat options or use as a base coat for other General Polymers Brand systems.

Slurry @ 1/8"

Mixing and Application

DO NOT PREMIX 4080 PART B HARDENER. OVER EXPOSURE TO AIR EFFECTS PHYSICAL PROPERTIES

1. Add 4080A (resin) to 4080B (hardener) and mix with low speed drill and Jiffy mixer until uniform.

2. Pour 35 lbs. 5035 aggregate and 1 pre-measured unit (1 gal Part A: short-filled gal Part B) until no lumps remain. Immediately pour mixed material onto the substrate and pull out using a 3/8" x 3/8" notched squeegee or notched trowel, or screed rake. Place all material within 15 minutes. Back roll with a loop roller to assist leveling. Allow material to self-level (2-5 minutes).

3. Broadcast Silica Sand (20-40 Mesh) to saturation (about 400# per 1000 square feet).

4. Allow to cure for a minimum of 4-5 hours, sweep off excess sand with a clean, stiff bristled broom. Clean sand can be saved for future use. All imperfections such as high spots should be smoothed before the application of the seal coat.

NOTE: Dry Silica Sand distribution is critical to the success of the application. The floor's finished appearance depends on the manner in which the sand has been applied. In grass seed like fashion, allow the sand to fall after being thrown upward and out. DO NOT THROW DOWNWARD AT A SHARP ANGLE USING FORCE.

5. Allow slurry to cure for a minimum of 4 hours before applying topcoat. NOTE: If applying any topcoat other than 4090TC allow the slurry to cure for 12 hours.

Topcoat

Mixing and Application

DO NOT PREMIX Part A or Part B

1. Combine 4090TCA (resin) with GP5095 Part C (aggregate) TC = 1.25 gallons per kit and mix until lump free, approximately 60-90 seconds, the product will thicken and become creamy, which lessens the potential for fine cement/pigment balls to form. Add part B and mix until fully combined and uniform in color, approximately 30 seconds.

2. Apply 4090TC using trowel, squeegee, or grout float and backroll with a 1/4" - 3/8" nap roller to remove any marks and provide uniform texture, in thicker films >10 mils loop rollers may also prove effective. Spread at a rate of 80-100 square feet per unit evenly, with no puddles making sure of uniform coverage.

NOTE: Do not dip and roll. Do not roll out of a puddle or ribbon. Must apply using squeegee or trowel.

3. Allow to cure 6 hours minimum before opening to light foot traffic. If recoating is required, abrade surface before recoating.

* When applied direct to concrete, FasTop 12TC can be loop rolled after 20-30 minutes to create a non-skid coating without the addition of broadcast aggregate. Contact Tech Service for details.

Cleanup

Clean up mixing and application equipment immediately after use. Use toluene or xylene. Observe all fire and health precautions when handling or storing solvents.

Safety

Refer to the MSDS sheet before use. federal, state, local and particular plant safety guidelines must be followed during the handling and installation and cure of these materials.

Safe and proper disposal of excess materials shall be done in accordance with applicable federal, state, and local codes.

Material Storage

Store materials in a temperature controlled environment (50°F – 90°F) and out of direct sunlight.

Keep resins, hardeners, and solvents separated from each other and away from sources of ignition.

Maintenance

Occasional inspection of the installed material and spot repair can prolong system life. For specific information, contact the Technical Service Department.



Shipping

- Destinations East of the Rocky Mountains are shipped F.O.B. Cincinnati, Ohio.
- Destinations West of the Rocky Mountains are shipped F.O.B. Victorville, California.

For specific information relating to international shipments, contact your local sales representative.

Disclaimer

The information and recommendations set forth in this document 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(s) offered at the time of publication. Published technical data and instructions are subject to change without notice.

Consult www.generalpolymers.com to obtain the most recent Product Data information and Application 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.



To learn more, visit us at

www.sherwin-williams.com/protective
or call 1-800-524-5979
to have a representative contact you.

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Protective & Marine Coatings 02/15



Protective & Marine Coatings

GENERAL POLYMERS® 4090 FASTOP™ 12TC URETHANE COATING

PART A GP4090A01 SERIES
 PART B GP4090B01 HARDENER
 PART C GP5095C01 AGGREGATES

Revised February 17, 2015

PRODUCT INFORMATION

PRODUCT DESCRIPTION

GENERAL POLYMERS 4090 FASTOP 12TC URETHANE COATING is a 3 part, low gloss coating for use over all FasTop Systems. GENERAL POLYMERS 4090 FASTOP 12TC URETHANE COATING can also be used to reestablish non-skid properties to an existing resinous floor as a protective coating or a safety coating direct to concrete.

ADVANTAGES

Resistant to a wide range of chemicals		
28 Day Exposure @ 72°F		
NE= No Effect		Result
Alcohol		NE
Ethylene Glycol		NE
Fats, Oils & Sugars		NE
Gasoline, Diesel & Kerosine		NE
Hydrochloric Acid (<35%)		Yellowing
Lactic Acid (Milk)		NE
Mineral Oils		NE
Most Organic Solvents		NE
Muriatic Acid		NE
Nitric Acid (<10%)		Yellowing
Nitric Acid (<30%)		Yellowing
PM Acetate		NE
Phosphoric Acid (<50%)		NE
Potassium Hydroxide (<50%)		NE
Sodium Hydroxide (<50%)		NE
Sulfuric Acid (>50%)		Yellowing
Water		NE
Xylene		NE

- Rapid cure and hardness development
- May be applied direct to prepared concrete
- Water-based
- Low temperature cure @ 40°F (4°C)
- Acceptable for use in USDA inspected facilities
- Impact and abrasion resistant
- Moisture insensitive

TYPICAL USES

GENERAL POLYMERS 4090 FASTOP 12TC URETHANE COATING is a finish coat for all FasTop systems or direct to concrete as a non-skid coating.

LIMITATIONS

- Do not install in drafty conditions allowing air movement to pass over the coating while being installed.
- Do not pre-mix Part A or Part B
- Substrate must be structurally sound and free of bond inhibiting contaminants.
- During installation and initial cure cycle, substrate and ambient air temperature must be at a minimum of 40°F (4°C) and 90°F (32°C) maximum. Substrate temperature must be at least 5°F (3°C) above the dew point (for lower temperature installation contact the Technical Service Department).
- When required, adequate ventilation shall be provided and proper clothing and respirators worn.
- Do not install in open areas during rain.
- Strictly adhere to published coverage rates.

PRODUCT CHARACTERISTICS

Color: Red, Gray, Yellow, Neutral
Mix Ratio: A:B:C Pre-measured A and B components
 Plus 8 lbs aggregate (GP5095)
 TC = 1.25 gallons per kit
Viscosity, mixed: 600 cps
Volume Solids: 59% ± 2%, mixed
Weight Solids: 90% ± 2%, mixed
VOC (EPA Method 24): <50 g/L mixed, 0.41 lb/gal

Recommended Spreading Rate per kit:

	Minimum	Maximum
Wet mils (microns):	6.0 (150)	30.0 (750)
Varies with application		
Coverage sq ft/unit (m ² /L):	65 (6.0)	300 (27.9)

Drying Schedule @ 6 mils (150 microns) wet:

@ 73°F (23°C)
To touch: 4 hours
Light Foot Traffic: 6 hours
Heavy traffic: 12-18 hours minimum
Full Cure: 24 hours
If maximum recoat time is exceeded, abrade surface before recoating. Drying time is temperature, humidity, and film thickness dependent.
Pot Life: gallon mass 10-15 minutes @ 73°F (23°C)

Shelf Life: Part A: 36 months, unopened
 Part B: 36 months, unopened
 Store indoors at 50°F (10°C) to 90°F (32°C).
Flash Point: >212°F (>100°C), ASTM D 93, mixed

PERFORMANCE CHARACTERISTICS

Test Name	Test Method	Results
Abrasion Resistance	ASTM D 4060, CS17 wheel, 1000 cycles	20-30 mg loss
Adhesion	ACI 503R	350 psi concrete failure
Compressive Strength	ASTM C 579	>6,000 psi
Critical Radlant Flux	ASTM E 648	>1.0
Dry Heat Resistance	ASTM D 2485	250°F (121°C)
Flammability		Self-extinguishing over concrete
Flexural Strength	ASTM C 580	3,700 psi
Hardness, Shore D	ASTM D 2240	>80
Impact Resistance	MIL-D-3431, Sec 4.7.3	Withstands 16 ft/lbs without cracking, delamination of chipping
Shrinkage		Nil
Smoke Density	ASTM E 662	224-236
Tensile Strength	ASTM D 412	1,750 psi
Water Absorption		Nil

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continued on back



**Protective
&
Marine
Coatings**

**GENERAL POLYMERS® 4090
FASTOP™ 12TC URETHANE COATING**

PART A	GP4090A01	SERIES HARDENER AGGREGATES
PART B	GP4090B01	
PART C	GP5095C01	

Revised February 17, 2015

PRODUCT INFORMATION

SURFACE PREPARATION

Proper inspection and preparation of the substrate to receive resinous material is critical. Read and follow the "Instructions for Concrete Surface Preparation" (Form G-1) for complete details.

APPLICATION

APPLICATION INSTRUCTIONS

DO NOT PREMIX Part A or Part B

1. Combine 4090A (resin) with 5095 Part C (aggregate) TC = 1.25 gallons per kit and mix until lump free, approximately 60-90 seconds, the product will thicken and become creamy, which lessens the potential for fine cement/pigment balls to form. Add part B and mix until fully combined and uniform in color, approximately 30 seconds.

2. FasTop 12TC can be used as a stand alone coating or as a top-coat for various FasTop Systems. Refer to the specific FasTop System Bulletin for application instructions and coverage information.

As a coating FasTop 12TC can be applied by squeegee, trowel, brush or roller based upon use. Coverage can vary from 65 to 300 feet per kit as required for the intended application.

Apply 4090TC using trowel, squeegee, grout float and backroll with a 1/4" - 3/8" nap roller to remove any marks and provide uniform texture, in thicker films >10 mils loop rollers may also prove effective. Spread evenly, with no puddles making sure of uniform coverage. **Take care not to puddle materials and insure even coverage.**

NOTE: Do not dip and roll. Do not roll out of a puddle or ribbon.

3. Allow to cure 6 hours minimum before opening to light foot traffic. If recoating is required, abrade surface before recoating.

* When applied direct to concrete, 4090TC can be loop rolled after 20-30 minutes to create a non-skid coating without the addition of broadcast aggregate. Contact Tech Service for details.

ORDERING INFORMATION

Packaging:	
Part A:	64 oz. in gallon container
Part B:	51.2 oz in gallon container
Part C:	8 lbs. per bag
Weight:	16.13 ± 0.2 lb/gal; 1.9 Kg/L

CLEANUP

Clean up mixing and application equipment immediately after use. Use toluene or xylene. Observe all fire and health precautions when handling or storing solvents.

SAFETY

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.

MAINTENANCE

Occasional inspection of the installed material and spot repair can prolong system life. For specific information, contact the Technical Service Department.

SHIPPING

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WARRANTY

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GUIDELINE INSTRUCTIONS FOR CONCRETE SURFACE PREPARATION (FORM G-1, REVISED 01/12)

INTRODUCTION

The following concrete surface preparation guidelines, serves as an aide to owners, design professionals, specifiers and contractors. All surfaces to receive General Polymers sealers, coatings, mortars and resurfacers, must be structurally sound, clean and at minimum, saturated surface dry (SSD). Proper surface preparation is an extremely important factor in the immediate and long-term successful performance of applied polymer floor or wall systems.

The contractor responsible for the installation of the polymer system shall be provided a substrate that is clean, durable, flat, pitched to specifications, SSD and free of surface contaminants. Providing the "proper substrate" is the responsibility of the owner, the owner's appointed representative and the concrete contractor, unless specifically stated otherwise. Guide Specification for "Cast in Place Concrete for Floor Slabs on Ground That Will Receive Semi-Permeable or Impermeable Floor Finishes", should be referred to for installation of fresh concrete. Regardless of responsibility, the steps listed below must be accomplished prior to the placement of a bonded polymer system on concrete.

PROPER SURFACE PREPARATION

Proper surface preparation includes the following:

1. Inspection of the concrete substrate
2. Removal and replacement of non-durable concrete
3. Decontamination of the concrete surface
4. Creation of surface profile
5. Repair of surface irregularities

1. Inspection of the concrete substrate to determine its general condition, soundness, presence of contaminants, presence of moisture vapor emissions and the best methods to use in preparation of the surface to meet the requirements of the owner or the owner's appointed representative is critical. A proper evaluation will lead to the selection of the proper tools and equipment to accomplish the objective.

2. Removal and replacement of non-durable concrete must be accomplished prior to installation of the polymer system. Localized weak or deteriorated concrete must be removed to sound concrete and replaced with cementitious or polymer concrete repair mortars, or an engineered concrete mix design utilizing GP4700 series polyacrylate polymer additive. For application of these systems and compatibility with the selected polymer sealer, coating, lining or topping refer to the System Bulletins, Technical Data Sheets or the Technical Services Department. Occasionally, plain fresh concrete is required and must be bonded to existing concrete. When bonding fresh concrete to existing, prepare the existing concrete surface by scabbling, scarifying, abrasive (sand) blasting, needle scaling, high pressure water jetting (5,000 to 45,000 psi), or steel shotblasting. Apply a low modulus epoxy as the bonding agent at a rate of 80 square feet per gallon for a WFT of 20 mils, and then place the fresh concrete or mortar. Bonding to lightweight concrete may require a second coat of epoxy if the first coat is readily absorbed into the concrete surface. Always place the fresh concrete within the open time of the epoxy, while the epoxy-bonding agent is still wet. Rough concrete surfaces will require additional material depending on the surface profile. Fresh concrete should have a low water cement ratio (w/c) not to exceed 0.40. When bonding fresh concrete containing latex polymer admixtures, check compatibility of the latex modified concrete mixture by either installing a test patch and performing a pull-off test, or by conducting a slant shear test in accordance with ASTM C 882, in an independent concrete testing laboratory.

3. Decontamination of the concrete surface requires the removal of oils, grease, wax, fatty acids and other contaminants, and may be accomplished by the use of detergent scrubbing with a heavy duty cleaner/degreaser, low pressure water cleaning (less than 5,000 psi), steam cleaning, or chemical cleaning. The success of these methods is dependent upon the depth of penetration of the contaminant; which is completely dependent upon the contaminant's viscosity, the concrete's permeability and the duration of exposure. Special care should be taken when preparing concrete at an "in use" facility for repair, replacement or an initial floor topping. This is especially true for Food Processing facilities. Contaminants can be carried into exposed concrete as most of these facilities use copious amounts of water. The contaminants can be animal fats/oils, blood, cleaning solutions, microbes, etc. They may not be completely removed during preparation (shot blasting). The concrete may appear clean and well profiled.

A simple method to ensure you have sound concrete is to test the pH. The chemistry of concrete is alkaline in nature. Normal concrete should be in the range of 11 to 13. Most of the contaminants mentioned are neutral to acidic in nature. After preparation test the floor in multiple locations using distilled water and the pH paper. If the pH is 10 or lower additional preparation will be required to ensure a good bond. In areas where the contaminants can not be removed, the contaminated concrete must be removed and replaced as in 2., above.

CAUTION: Decontamination methods that introduce large amounts of water may contribute to moisture related problems as referenced in APPENDIX A.

4. Creation of surface profile can be accomplished by a number of methods each utilizing a selection of tools, equipment and materials to accomplish the intended purpose. (See METHODS OF SURFACE PREPARATION below). Selection is dependent upon the type of surface to be prepared and the type of system to be installed. In addition, floors, walls, ceilings, trenches, tanks and sumps each have their own particular requirements. The type and thickness of the selected polymer system also plays an important role in the selection process. Regardless of the method selected or tools employed, we must provide a surface that will accept the application of polymer-based products and allow the mechanical bond of the polymer securely to the concrete. The type of service the structure will be subjected to, will also help to define the degree of profile required. The surface profile is the measure of the average distance from the peaks of the surface to the valleys as seen through a cross sectional view of the surface of the concrete.

This dimension is defined pictorially and through physical samples in the ICRI Technical Guideline No 03732, and is expressed as a Concrete Surface Profile number (CSP 1-9).

- For General Polymers coating and sealing applications from 4 to 15 mils in thickness, the surface profile shall be CSP 1, 2, or 3, typically accomplished through decontamination of the concrete surface as defined in 3. above, followed by acid etching, grinding, or light shotblast.
 - For General Polymers EPO-FLEX[®] and other coating applications from 15 to 40 mils in thickness, the surface profile shall be CSP 3, 4, or 5, typically accomplished through decontamination of the concrete surface as defined in 3. above, followed by light shotblast, light scarification or medium shotblast.
 - For General Polymers CERAMIC CARPET[™], TRAFFICOTE[™], AquArmor[™] S, AquArmor MCS, **FasTop[™]** MVT and other topping applications from 40 mils to 1/8", the surface profile shall be CSP 4, 5, or 6. These are typically accomplished through decontamination of the concrete as defined in #3 above, followed by light scarification, medium shotblast or medium scarification.
 - General Polymers Terrazzo, CERAMIC CARPET[™], TRAFFICOTE[™], AquArmor[™] S, AquArmor MCS, **FasTop[™]** MVT, **FasTop[™]** Slurry and Mortar systems and other topping. Applications greater than 1/8", the surface profile shall be CSP 5, 6, 7, 8, or 9. These are typically accomplished through decontamination of the concrete as defined in 3 above, followed by medium shotblast, medium scarification, heavy abrasive blast, scabbled, or heavy scarification.
- 5. Repair of surface irregularities** including bugholes, spalls, cracks, deteriorated joints, slopes, areas near transition zones, such as around drains and doorways, etc. must be repaired prior to the placement of the polymer system and/or the system must be designed to off-set the thickness of the irregularities. For removal and replacement information and materials, refer to item 2., above. For bugholes and other minor surface irregularities, fill with Epoxy Quick Patch (GP3500), GP4700 Instant Patch Resin or the system resin mixed with a vertical grade aggregate. For treatment of cracks and joints refer to the section below entitled "Crack Isolation". For additional questions, contact the Technical Service Department or, your local sales representative for specific recommendations.

For specific applications, always consult General Polymers System Bulletins, Technical Data Sheets or Technical Services Department.

METHODS OF SURFACE PREPARATION

Depending upon conditions of the concrete one or more methods of surface preparation may be required. It is common for decontamination to precede mechanical preparation, and if necessary a second decontamination to follow.

The preferred methods for creation of a surface profile, including the removal of dirt, dust, laitance and curing compounds, is steel shotblasting, abrasive (sand) blasting or scarifying. The steel shotblasting or vacuum blasting process is commonly referenced by equipment brand names, such as, Blastrac, Vacu-Blast, Shot-Blast, etc. Vertical and overhead surfaces, such as cove base, wall, and ceiling surfaces shall be prepared utilizing methods of grinding, scarifying, abrasive (sand) blasting, needle scaling, high pressure water jetting (5,000 to 45,000 psi), or vertical steel shotblasting. CAUTION: The use of high pressure water jetting will introduce large amounts of water, which may contribute to moisture related problems as referenced in APPENDIX A. The following table provides a guide for the degree of surface profile required for the coating or overlay to be applied and the preparation methods used to generate each profile.

Application	Profile	Surface Preparation Method
Sealers	0-3 mils	Detergent scrub Low-pressure Water Acid Etching (not recommended) Grinding
Thin Film	4-10 mils	Acid Etching (not recommended) Grinding Abrasive Blast Steel Shot Blast
High-Build	10-40 mils	Abrasive Blast Steel Shot Blast Scarifying
Self-Leveling	50mils-1/8 inch	Abrasive Blast Steel Shot Blast Scarifying Needle Scaling High/Ultra high Pressure Water Jetting
Polymer Overlay	1/8-1/4 inch	Abrasive Blast Steel Shot Blast Scarifying Needle Scaling High/Ultra high Pressure Water Jetting Scabbling Flame Blasting Milling/rotomilling

Surfaces to receive the bonded polymer system must be inspected after the surface is prepared to insure that the substrate is sound and structurally durable. Areas found to be unsound or non-durable must be removed and replaced as described in 2., above. Dust or other deleterious substances not removed after the initial surface preparation must be vacuumed, leaving the surface dust free and clean.

Other surface preparation methods are mentioned in ADDITIONAL SURFACE PREPARATION REFERENCES below.

CRACK ISOLATION

The performance of elastomeric products such as EPO-FLEX® internally flexible epoxy, requires a relatively uniform dry film thickness to resist drying shrinkage and thermal movement of the concrete, while maintaining a seamless bridge or seal over the concrete. Therefore it is critical that all mortar splatter, protrusions, ridges, penetrations, or sharp projections in the surface of the concrete, be ground smooth or otherwise made smooth, in addition to the normal surface preparation outlined above.

Prior to application of an elastomeric system, control/contraction joints, construction joints, and cracks should be sealed with the selected system flexible sealant, i.e., 3580 Joint and Crack Filler, 4880 Polyurea Joint Sealant, EPO-FLEX flexible sealant. This coating should extend a minimum of 6" on either side of the joint or crack. The entire surface area should then receive the specified crack isolation system. Isolation and/or expansion joints should be detailed in accordance with the plans and specifications of an architectural or engineering design professional for the type of structure being considered. Consult the Technical Services Department for the proper selection and use of Isolation materials and the potential use of fiberglass scrim cloth for additional crack bridging capabilities.

NOTE: General Polymers systems can be applied to a variety of substrates if the substrate is properly prepared. Preparation of surfaces other than concrete or steel, such as wood, concrete block, brick, quarry tile, glazed tile, cement terrazzo, vinyl composition tile, plastics and existing polymer systems, can be accomplished to receive bonded polymer sealers, coatings, or toppings. For questions regarding a substrate other than concrete or steel, or a condition not mentioned in this guideline, contact the Technical Service Department prior to starting the project. For steel surfaces, refer to Guideline Instructions for Surface Preparation of Structural Steel, Form G-2.

ADDITIONAL SURFACE PREPARATION REFERENCES

Important and relevant information on surface preparation of concrete is available by referencing the following codes, standards, and guidelines.

- | | |
|------|--|
| SSPC | The Society for Protective Coatings, 40 24 th Street, 6 th Floor, Pittsburgh, Pa. 15222-4643, (412) 281-2331. <ul style="list-style-type: none">• SSPC-SP 13 Surface Preparation of Concrete• SSPC-TU 2/NACE 6G197 Design, Installation, and Maintenance of Coating Systems for Concrete Used in Secondary Containment |
| ICRI | International Concrete Repair Institute, 38800 Country Club Drive Farmington Hills, MI 48331, (248) 848-3809 <ul style="list-style-type: none">• Technical Guideline No.03732, "Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays". Includes visual standards to act as a guide in defining acceptable surface profiles for the application of industrial coatings and polymer floor toppings.• Technical Guideline No.03730, "Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion". |
| ASTM | American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, (610) 832-9585 <ul style="list-style-type: none">• ASTM D 4258 "Practice for Surface Cleaning Concrete for Coating"• ASTM D 4260 "Standard Practice for Acid Etching Concrete"• ASTM D 4261 "Practice for Surface Cleaning Unit Masonry for Coating"• ASTM D 4262 "Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces" |

**APPENDIX A:
TESTING FOR MOISTURE VAPOR EMISSION FROM CONCRETE**

Excess moisture in concrete can produce harmful effects of discoloration, interruption of the polymerization of products, and delaminating of non-permeable resinous systems. Sources of moisture fall into three distinct categories. Moisture present at the surface prior to or during application, moisture within the concrete that attempts to escape during and after application and a distinct source of moisture in intimate contact with the concrete that provides a continuous supply of moisture. Avoiding moisture related problems and understanding the options available for remediation once they occur is important. Detecting moisture in concrete may be accomplished by employing a number of methods briefly described below:

Relative Humidity Method BS 8201 and BS 5325 - These are British Standards that result in pass/fail of whether or not moisture is being emitted, but does not quantify the results. This is not a useful test.

Gel-B Bridge Test - This test measures electrical resistance of the concrete, but is dependent not only on the moisture content of the concrete, but also on the other constituents of the concrete. Calibration of the results obtained with this method, depend on knowing the mix design of the concrete and the raw material used. At best it is a difficult interpretation.

Radio Frequency (capacitance-impedance) Method- This method relies on portable electronic moisture meters that transmit strong radio waves that are absorbed by water. Calibration of the results obtained with this method depends on knowing the mix design of the concrete and the raw material used.

Carbide-Acetylene Test - This destructive test tells us nothing about the relative movement of moisture out of the concrete. It only quantifies that the portions of concrete removed and tested contain a measured content of moisture.

ASTM F 2170-02- Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using *in situ* Probes - The test method, modeled after the process uses in Europe for several years, requires drilling holes at a diameter of 5/8" to a depth equal to 40% of the slab's thickness. The hole is then lined with a plastic sleeve, capped and allowed to acclimate for 72 hours. The probe is placed in the sleeve, allowed to equilibrate for 30 minutes, and then readings are recorded. Acceptable relative humidity readings for substrates receiving non-permeable flooring are 80% or lower. Testing should take place in an acclimated building and is required to equal 3 tests in the first 1,000 square feet, with one additional test per each additional 1,000 square feet of concrete slab surface. This test method is less subject to conditions occurring at the concrete surface that may influence calcium chloride test results. This method only defines existing moisture content of the sample and cannot address moisture vapor transmission.

ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method - This qualitative method will indicate the presence of moisture movement, but it will not quantify the amount of moisture movement, and is only useful in determining that additional testing is required.

ASTM F 1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride Moisture Emissions Test - Originally developed by the Rubber Manufacturers Association, General Polymers Moisture Vapor Test Kits use anhydrous calcium chloride to make a quantitative evaluation of vapor emissions from the concrete. To determine the amount of moisture movement, the floor and surrounding environment must be in the anticipated service condition. The test must be conducted over raw exposed concrete, which has been exposed to the environment for at least 24 hours. A quantitative evaluation is conducted wherein the anhydrous calcium chloride container & contents are pre-weighed on a gram scale, allowed to remain in it's container with the lid removed, and the container placed under a sealed dome to prevent loss of moisture for a period of 60 to 72 hours.

Three tests are required for the first 1000 S.F., with one additional test for every 1000 S.F., or fraction thereafter. The container is removed and again weighed on a gram scale to determine the weight gain of the anhydrous calcium chloride. A calculation is performed to determine the amount of moisture adsorbed. These results are quantified as the rate of moisture vapor transmission expressed as pounds per 1000 square feet of surface area per 24 hours. General Polymers has adopted a commonly accepted value for application of polymer coatings or toppings to be not more than 3 pounds of moisture per 1,000 square feet per 24 hrs.

Moisture content and moisture movement, are merely snapshots in time of dynamic conditions within the concrete. Moisture vapor movement is dependent upon the relationship between temperature and humidity of the two adjacent environments. In this case, the internal environment of concrete and the external environment of the air surrounding the concrete. Any change in temperature and/or moisture content of either will result in a change in vapor pressure and the attempted movement of moisture vapor into or out of the concrete as referenced below:

It is the combination of temperature and humidity (called vapor pressure) that determines the direction of moisture movement. Moisture will move from a higher vapor pressure to a lower vapor pressure. When there is air movement over the surface of the concrete, moisture will attempt to move out of the concrete toward the area of air movement.

For these reasons, it is important to measure the temperature and relative humidity during the test period. The Moisture Vapor Test Kit values will not be useful in predicting possible problem areas unless the tests are conducted in the environment in which the structure will be used. The air temperature and humidity around the concrete during the test should be the same air temperature and humidity that will be in place during the useful life of the structure. Contact the Technical Service Department immediately if there are any questions concerning the use of the test kits or interpretation of the results.

- To successfully and predictably reduce moisture vapor emission rates apply one of the following remediation systems:
- FasTop MVT; or
- AquArmor MCS.

Consultation with the Technical Service Department for specific recommendations and utilized in accordance with application instructions. For slabs with potential moisture issues, utilizing systems that are designed to accommodate moisture movement from the slab such as FasTop and AquArmor Systems may be the most cost effective alternative. Whenever, moisture issues present themselves on a project document the conditions, inform the owner representative and consult with General Polymers technical service personnel.

Consult the technical paper, "Prevention of Moisture Related Disbondment of Non-Permeable Flooring Systems", for more details and potential solutions if a problem is detected. For copies of this and other technical articles, please visit our web site at www.generalpolymers.com or contact your local sales representative.

Note: The industry standard for curing concrete is 28 days. This is usually sufficient to allow excess moisture to leave a concrete slab. To minimize moisture related disbondment, new concrete should be allowed to cure 28 days before installation of General Polymers non-permeable resinous flooring systems. If any doubts exist concerning moisture in the slab, Calcium Chloride and/or Humidity tests should be run to document the presence of moisture.

DEW POINT CALCULATION CHART (FAHRENHEIT)

% Relative Humidity	AMBIENT AIR TEMPERATURE °F										
	20	30	40	50	60	70	80	90	100	110	120
90	18	28	37	47	57	67	77	87	97	107	117
85	17	26	36	45	55	65	75	84	95	104	113
80	16	25	34	44	54	63	73	82	93	102	110
75	15	24	33	42	52	62	71	80	91	100	108
70	13	22	31	40	50	60	68	78	88	96	105
65	12	20	29	38	47	57	66	76	85	93	103
60	11	19	27	36	45	55	64	73	83	92	101
55	9	17	25	34	43	53	61	70	80	89	98
50	6	15	23	31	40	50	59	67	77	86	94
45	4	13	21	29	37	47	56	64	73	82	91
40	1	11	18	26	35	43	52	61	69	78	87
35	-2	8	16	23	31	40	48	57	65	74	83
30	-6	4	13	20	28	36	44	52	61	69	77



To learn more, visit us at www.generalpolymers.com or call 1-800-524-5979 to have a representative contact you.

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