SECTION 09 67 23
RESINOUS FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Chemical Resistant 3-coat Epoxy / Urethane Flooring System

1.2 RELATED SECTIONS

A. Section 03 30 00 - Cast-in-Place Concrete.

1.3 REFERENCES

A. ACI 503R - Adhesives for Concrete.

B. ASTM International (ASTM):
1. ASTM C 190 - Method of Test for Tensile Strength of Hydraulic Cement Mortars.
2. ASTM C 293 - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading).
3. ASTM C 307 - Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacings.
4. ASTM C 579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
5. ASTM C 580 - Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
6. ASTM C 884 - Standard Test Method for Thermal Compatibility Between Concrete and an Epoxy-Resin Overlay.
7. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
8. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics.
9. ASTM D 790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
10. ASTM D 2240 - Standard Test Method for Rubber Property-Durometer Hardness.
11. ASTM D 4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.

C. ICRI - International Concrete Repair Institute, Inc.

D. MIL-D-3134J - Military Specification: Deck Covering Materials (05 Oct 1988).

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.

3. Installation methods.

C. System Data: Submit manufacturer's specifications on cured system and individual components of the Flooring System, including physical properties and performance properties and tests along with Material Safety Data Sheets. Each individual component of the system shall be evaluated on the basis of these standards. For any tests not listed in the manufacturer's standard nationally published data, the manufacturer shall supply the missing data accompanied by the independent testing laboratory's test results which prove compliance in accordance with the referenced standards. Furnish required number of sets of this information for review.

D. Shop Drawings: Submit details of construction; include relationship with adjacent construction.

E. Selection Samples: For each finish product specified complete sets of color samples representing manufacturer's full range of available colors.
1. Submit manufacturer's standard color chart. Computerized custom color matching shall be available upon request. Furnish required number of sets of this information for review and selection.

F. Verification Samples: For each finish product specified, two samples, minimum size 3 inches (150 mm) square representing actual product, color, and patterns.
1. Submit a cured system sample which the Contractor has made for verification purposes and finish texture approval.

G. Contractor Experience: The Contractor shall furnish a list of projects using either specified material or equivalent that they have installed during the last three years. Information shall include: project name, square footage, owner contact name with owner's address and phone number. Also, the contractor shall furnish resumes detailing the experience of key project personnel including supervisors and mechanics.

H. Installer Certificates for Qualification: Signed by manufacturer certifying that installers comply with specified requirements.

I. Manufacturer's Packing Slip: The Contractor shall submit a copy of the manufacturer's packing slip, tagged for the specific Project, along with calculations, signed by an officer of the primary material supplier demonstrating that the quantity of material furnished for the project will achieve the specified coverage and mil thickness.

J. Maintenance Data: For maintenance manuals.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain Flooring System materials from a single manufacturer with a minimum of five years verifiable experience providing materials of the type specified in this section.

B. Installer Qualifications:
1. Installation shall be performed by a manufacturer approved installer with skilled mechanics having not less than three years satisfactory experience in the installation of the type of system as specified in this section, and shall be approved in writing by the manufacturer of the flooring system.

C. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary

materials.

D. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Do not cover up mockup area.
   1. Apply full-thickness mockups on 16 square feet (1.5 sq. meters) floor area selected by Architect.
   2. Simulate finished lighting conditions for Architect's review of mockups.
   3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
   4. Mockup shall demonstrate desired slip resistance for review and approval by General Contractor prior to installing project areas.

1.6 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to starting work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Primary system materials shall be delivered in the manufacturer's undamaged, unopened containers. Each container shall be clearly marked with the following:
   1. Product names and/or Numbers.
   2. Manufacturer's name.
   3. Component designation (A, B, etc.).
   4. Product Mix Ratio.
   5. Health and Safety Information.
   6. CHEMTREC Emergency Response Information.

C. Provide equipment and personnel to handle the materials by methods which prevent damage.

D. The Contractor shall promptly inspect direct jobsite material deliveries to assure that quantities are correct, comply with requirements and are not damaged.

E. The Contractor shall be responsible for materials furnished and shall replace, at its expense, such materials that are found to be defective in manufacture or that have become damaged in transit, handling or storage.

F. Store materials in accordance with manufacturer's instructions, with seals and labels intact and legible. Maintain temperatures within the required range. Do not use materials which exceed the manufacturer's maximum recommended shelf life.

G. Handling: Handle materials to avoid damage.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

B. The Contractor shall visit the jobsite prior to the installation of the Flooring System to evaluate substrate condition, including substrate moisture transmission, quantity and severity of cracking, and the extent of repairs needed. Substrate imperfections should be repaired only after mechanical preparation of the substrate. Surface preparation reveals most imperfections requiring repair. Concrete substrates shall be tested to verify that the

moisture vapor transmission of the substrate does not exceed the Flooring System manufacturers' recommendations. Cost associated with repair, leveling and remediation of the substrate are the responsibility of the provider of the substrate.

C. The Contractor shall exercise care during surface preparation and system installation to protect surrounding substrates and surfaces, as well as in-place equipment. The Contractor shall prepare the substrate to remove laitance and open the surface. This shall be achieved by light brush grit blasting. Surface profile achieved shall be similar to medium grit sandpaper and free from bond-inhibiting contaminants.

D. Concrete subfloor tolerances shall be in accordance with ACI 302. Each drain in the installation area shall be working and raised or lowered to the actual finished elevation of the Flooring System.

E. The minimum slab temperature shall be conditioned to 60 degrees F (16 degrees C) before commencing installation, during installation, and for at least 72 hours after installation is complete. The substrate temperature shall be at least 5 degrees F above the dew point during installation.

F. Maintain lighting at a minimum uniform level of 50 or more foot candles in areas where the Flooring System is being installed.

G. Leaks from pipes and other sources must be corrected prior to the installation of the Flooring System.

1.9 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.10 WARRANTY

A. The Contractor and the manufacturer shall furnish a standard guarantee of the Flooring System for a period of one year after installation. The labor and material guarantee shall include loss of bond and wear-through to the concrete substrate from normal use.

B. Not included in the warranty are damage due to structural design deficiencies including but not limited to slab cracking from lateral, vertical or rotational movement, and gouging or other damage due to fork lifts, other equipment, delamination caused by vapor transmission, Acts of God, or other elements beyond the scope of protection of this system nor causes not related to the system materials.

C. In case of a warranty claim, the Owner shall notify the manufacturer and Contractor in writing within 30 days of the first appearance of problems covered under this Warranty. The Owner will provide free and unencumbered access to the area during normal working hours for repairs.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Sherwin-Williams, which is located at: 101 Prospect Ave.; Cleveland, OH 44115: Josh Hinson – Joshua.h.hinson@sherwin.com – 904-591-3137

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 RESINOUS FLOORING SYSTEM

A. Product: Sherwin-Williams Resinous Flooring System:
   1. The total system thickness shall be 20-25 mils.
   2. Color and Pattern: As indicated from manufacturers listed offerings.
   3. 100% Solids Epoxy Primer: GP3579 Epoxy Primer/Sealer @ 5-7 mils DFT.
   4. 100% Solids Epoxy Body Coat: GP3746 High Performance Epoxy (Pigmented) @ 12-15 mils DFT
   5. Polyester Urethane Topcoat: General Polymers Armorseal HS Poly Floor Enamel (Pigmented) @ 2-3 mils DFT.
   6. Joint Sealant – Adhesive Technologies JF-311 Polyurea Joint Sealant

B. Typical Physical Properties:
   1. VOC Content of Resinous Flooring: Provide resinous flooring systems, for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
      a. Resinous Flooring: 100 g/L.
   2. Resinous Flooring: Abrasion-, impact- and chemical-resistant, high-performance, resin-based, monolithic floor surfacing designed to produce a seamless floor.
   3. Slip Resistance: Provide slip resistant finish at owner’s discretion

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 SURFACE PREPARATION

A. Mechanically Prep Surface to provide a ICRI CSP 2-3

3.3 INSTALLATION

A. Inspection: Prior to commencing Work, thoroughly examine all underlying and adjoining work, surfaces and conditions upon which Work is in any way dependent for perfect results. Report all conditions which affect Work. No "waiver of responsibility" for incomplete, inadequate or defective underlaying and adjoining work, surfaces and conditions will be considered, unless notice of such unsatisfactory conditions has been filed and agreed to in writing before Work begins. Commencement of Work constitutes acceptance of surfaces. Test and report for moisture level in substrate to verify compliance with manufacturer's requirements. Do not proceed unless acceptable test results are achieved.

B. Surface Preparation: Remove all surface contamination, loose or weakly adherent particles, laitance, grease, oil, curing compounds, paint, dust and debris by blast track method or approved mechanical means (acid etch not allowed). If surface is questionable try a test patch. Create a minimum surface profile for the system specified in accordance with the methods described in ICRI No. 03732 to achieve profile numbers as follows:
   1. CSP 2-3

C. Environmental Conditions:
   1. All applicators and all other personnel in the area of the Flooring System installation shall take all required and necessary safety precautions. Manufacturers' installation instructions shall be followed.
   2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.

3. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
4. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.
5. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
6. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

D. Applications:
1. Install resinous floor over properly prepared concrete surface in strict accordance with the manufacturer's directions.
   a. Install the primer and/or base coats over thoroughly cleaned and prepared concrete.
   b. Install topcoat over flooring after excess aggregate has been removed.
   c. Maintain a slab temperature of 60 degree F to 80 degree F (16 degrees to 27 degrees C) for 24 hours minimum before applying floor topping.
2. Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
   a. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
   b. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
   c. At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.
3. Sealant: Saw cut resinous floor topping at control joints in concrete slab. Fill saw cuts with sealant prior to final seal coat application. Follow manufacturer's written recommendations.
4. Primer: Apply primer over prepared substrate at manufacturer's recommended spreading rate.
5. Slip Resistant Finish: Provide grit for slip resistance at owner’s discretion.
6. Topcoats: Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.4 CURING, CLEANING AND PROTECTION

A. Cure the flooring system materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of the installation and prior to completion of the curing process.

B. Protect the flooring system from damage and wear during other phases of the construction operation, using temporary coverings as recommended by the manufacturer, if required. Remove temporary covering just prior to final inspection.

C. Clean the flooring system just prior to final inspection, using materials and procedures suitable to the system manufacturer.

D. Test each cleaner, in a small area, utilizing your cleaning technique to determine if color, gloss or texture will be affected. This precaution will demonstrate the effect of your cleaner and technique. If no deleterious effects are observed, continue with the procedure. If deleterious effects do occur, modify the cleaning material and/or procedure. For recommendations regarding types of cleaners, contact the flooring system manufacturer.

END OF SECTION

Protective & Marine Coatings

GENERAL POLYMERS™ 3579
STANDARD EPOXY PRIMER/ BINDER

PART A GP3579 SERIES
PART B GP3579B01 STANDARD HARDENER

Revised September 12, 2014

PRODUCT INFORMATION

PRODUCT DESCRIPTION

GENERAL POLYMERS 3579 STANDARD PRIMER / BINDER is a high solids, clear or pigmented epoxy primer and binder resin. GENERAL POLYMERS 3579 STANDARD PRIMER / BINDER is available in clear, red, white and gray, has good blush resistance and is low in viscosity to promote penetration of the concrete substrate and excellent wetting of mortar aggregate.

ADVANTAGES

- Good blush resistance at room temperature
- Low modulus of elasticity, stress relieving
- Acceptable for use in USDA inspected facilities

TYPICAL USES

GENERAL POLYMERS 3579 STANDARD PRIMER / BINDER is an epoxy primer for coatings, slurries, mortar overlays, and patches. It can be also used as a binder resin. For slurries, mortar and patching systems. Suitable for use in the Mining & Minerals Industry.

LIMITATIONS

- Slab on grade requires vapor/moisture barrier.
- Surface must be clean and dry.
- Cool damp conditions may cause surface blushing.
- Substrate must be structurally sound and free of bond inhibiting contaminants.
- During installation and initial cure cycle substrate andambient air temperature must be at a minimum of 50ºF (10ºC). Substrate temperature must be at least 5ºF (3ºC) above the dew point (for lower temperature installation contact your local representative.
- When required, adequate ventilation shall be provided and proper clothing and respirators worn.
- **Strictly adhere to published coverage rates.**

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.

PRODUCT CHARACTERISTICS

Color:	Clear, Red, Gray, White
Mix Ratio:	2:1
Volume Solids:	96% ± 2%, mixed
Weight Solids:	96% ± 2%, mixed
VOC (EPA Method 24):	<50 g/L mixed: 0.41 lbs/gal
Viscosity, mixed:	2,100 cps

Recommended Spreading Rate per coat:

	Minimum		Maximum	
Wet mils (microns):	**6**	(150)	**20**	(500)
~Coverage sq ft/gal (m^2/L):	**varies according to usage**			

Drying Schedule @ 6 mils (150 microns) wet:

	@ 73°F (23ºC)
To touch:	6-8 hours
To recoat:	10-20 hours

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

Pot Life: gallon mass 25-30 minutess @ 73°F (23ºC)

Shelf Life:	Part A: 36 months, unopened Part B (Standard): 36 months, unopened Store indoors at 50°F (10°C) to 90°F (32°C)
Flash Point:	>230°F (>110°C), ASTM D 93, mixed

PERFORMANCE CHARACTERISTICS

Test Name	Test Method	Results
Adhesion	ACI 503R	300 psi concrete failure
Compressive Strength	ASTM D 695	9,000 psi
Flammability		Self-extinguishing over concrete
Flexural Strength	ASTM D 790	6,000 psi
Hardness, Shore D	ASTM D 2240	75/65
Tensile Strength	ASTM D 638	3,000 psi

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Protective & Marine Coatings

GENERAL POLYMERS™ 3579
STANDARD EPOXY PRIMER/ BINDER

PART A GP3579 SERIES
PART B GP3579B01 STANDARD HARDENER

Revised September 12, 2014

PRODUCT INFORMATION

APPLICATION

- **APPLICATION INSTRUCTIONS**

1. Add 2 parts 3579A (resin) to 1 part 3579B (hardener) by volume. Mix with low speed drill and Jiffy blade for three minutes and until uniform. To insure proper system cure and performance, strictly follow mix ratio recommendations.

2. 3579 may be applied via spray, roller or brush. Apply evenly, with no puddles. Coverage will vary depending upon porosity of the substrate and surface texture.

3. 3579 application varies upon usage.

NOTE: Epoxy materials may tend to blush at the surface especially in humid environments. After the surface is primed and before installation of each subsequent coat, surface must be examined for blush (a whitish greasy film and/or low gloss). The blush must be completely removed prior to recoating using warm detergent water or through solvent wipe.

Epoxy materials will appear to be cured and dry to touch prior to full chemical cross linking. Allow epoxy to cure for 2-3 days prior to exposure to water or other chemicals for best performance.

ORDERING INFORMATION

Packaging:

Part A:	1 gallon (3.8L) and 5 gallon (18.9L) containers
Part B:	1 gallon (3.8L) and 5 gallon (18.9L) containers
Weight:	9.4 ± 0.2 lb/gal; 1.13 Kg/L mixed, may vary by color

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 your Sherwin-Williams representative.

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 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.

WARRANTY

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Protective & Marine Coatings

GENERAL POLYMERS® 3746
HIGH PERFORMANCE EPOXY

PART A	GP3746	SERIES
PART A	GP8746	WITH ANTIMICROBIAL AGENT
PART B	GP3746B01	HARDENER
PART B	GP3746B02	FAST CURE HARDENER

Revised: October 18, 2018

PRODUCT INFORMATION

PRODUCT DESCRIPTION

GENERAL POLYMERS 3746 High Performance Epoxy is a two-component, recoatable epoxy and binder resin. It may be used directly over primed substrates, or as a gloss seal coat over decorative slurry and mortar systems. GENERAL POLYMERS 3746 High Performance Epoxy is extremely hard wearing, chemical, impact and abrasion resistant.

ADVANTAGES

- Impact and abrasion resistant
- Durable, easy to clean
- Chemical resistant
- Suitable for use in USDA inspected facilities
- Acceptable for use in Canadian Food Processing facilities, categories: D2 (Confirm acceptance of specific part numbers/rexes with your SW Sales Representative)
- Available with an antimicrobial agent (GP8746 series)
- Tint bases can be tinted using Maxitoner @ 50% tint strength See Tinting section for details

TYPICAL USES

GENERAL POLYMERS 3746 High Performance Epoxy should be used in areas where maintenance of a high performance, aesthetically appealing and chemical resistant epoxy system is required. GENERAL POLYMERS 3746 High Performance Epoxy is suited for use in clean rooms, laboratories, workshops, and light assembly areas.

LIMITATIONS

- Slab on grade requires vapor/moisture barrier.
- Substrate must be structurally sound, dry and free of bond inhibiting contaminants.
- During installation and initial cure cycle substrate and ambient air temperature must be at a minimum of 50°F (10°C). Substrate temperature must be at least 5°F (3ºC) above the dew point (for lower temperature installation contact the Technical Service Department).
- Maximum dry surface temperature not to exceed 160°F (71°C).
- Strictly adhere to published coverage rates.
- Apply clear at only 10-15 mils (250-375 microns) maximum per coat.

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.

PRODUCT CHARACTERISTICS

Finish:	Gloss
Color:	Clear, Standard Colors Wide range of colors possible
Volume Solids:	99%, mixed
Weight Solids:	99%, mixed
Mix Ratio:	2:1
VOC (EPA Method 24):	<100 g/L; 0.83 lbs/gal (as applied)

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns):	**10.0** (250)	**30.0** (750)
Coverage sq ft/gal (m^2/L):	**53** (1.3)	**159** (3.9)

PRODUCT CHARACTERISTICS (CONT'D)

Drying Schedule @ 10.0 mils (250 microns) wet:

	@ 55ºF (13ºC)	@ 72°F(22°C)	@ 95°F(35°C)
Standard Hardener:		50% RH	
To touch:	16-24 hours	6-12 hours	4-8 hours
To recoat:			
minimum	24 hours	8 hours	6 hours
maximum	48 hours	24 hours	24 hours
Foot traffic:	48 hours	24 hours	18 hours
Heavy traffic:	96 hours	72 hours	60 hours
Full cure:	7 days	7 days	7 days
Fast Cure Hardener:			
To touch:		3-4 hours	
To recoat:			
minimum		6	
maximum		12	
Foot traffic:		10-12 hours	
Heavy traffic:		24 hours	
Full cure:		7 days	

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

Pot Life (Standard) gallon mass	60 minutes	40 minutes	20 minutes
Pot Life (Fast Cure) gallon mass		25 minutes	

Shelf Life:	Part A: 18 months, unopened Part B (Standard): 12 months, unopened Part B (Fast Cure): 12 months, unopened Store indoors at 40°F (4.5°C) to 100°F (38°C)

PERFORMANCE CHARACTERISTICS

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060, CS17 wheel, 1000 cycles	76 mg loss
Adhesion	ACI 503R	300 psi, concrete failure
Flammability		Self-extinguishing over concrete
Flexural Strength	ASTM D 790	~12,400 psi
Hardness, Shore D	ASTM D 2240	77
Impact Resistance	MIL-D-3134J	Direct: 160 in-lb Reverse: 20 in-lb
***Surface Burning**	ASTME84/ NFPA 255	Flame Spread Index 20; Smoke Development Index 90
Tensile Strength	ASTM D 638	3527.4 psi

*GENERAL POLYMERS 3477 at 1.5 mils (40 microns) DFT topcoated with GENERAL POLYMERS 3746 at 17.5 mils (438 microns) DFT

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Protective & Marine Coatings

GENERAL POLYMERS® 3746
HIGH PERFORMANCE EPOXY

PART A	GP3746	SERIES
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PART B	GP3746B01	HARDENER
PART B	GP3746B02	FAST CURE HARDENER

Revised: October 18, 2018

PRODUCT INFORMATION

STORAGE / APPLICATION

- MATERIAL DELIVERY AND STORAGE

Store materials in accordance instructions, with seals and labels intact and legible. Keep resins, hardeners, and solvents separated from each other and away from sources of ignition. 18 months shelf life is expected for products stored between 40°F (4.5°C) - 100°F (38°C).

- APPLICATION INSTRUCTIONS

1. Premix GP3746 (resin) using a low speed drill and Jiffy blade. Mix for one minute and until uniform, exercising caution not to introduce air into the material.

2. Add 2 parts GP3746 (resin) to 1 part GP3746B (hardener) by volume. Mix with low speed drill and Jiffy blade for three minutes and until uniform. To insure proper system cure and performance, strictly follow mix ratio recommendations.

3. Apply GP3746 using a squeegee or trowel and back roll with a 3/8" nap roller at a spread rate of 50-160 square feet per gallon (1.3-4.0 meters squared per liter) to yield 10-30 mils (250-750 microns) WFT making sure of uniform coverage. Take care not to puddle materials and insure even coverage.

4. Allow to cure 24 hours minimum before opening to traffic and 72 hours before water exposure.

Note: Epoxy materials will appear to be cured and “dry to touch” prior to full chemical cross linking. Allow epoxy to cure a minimum of 3 days prior to exposure to water or other chemicals for best performance.

TINTING

Tint bases can be tinted using Maxitoners @ 50% tint strength. No more than 6 oz. of Maxitoner colorant for the Ultra Deep Base and no more than 2 oz. of Maxitoner colorant for the White Base.

Ensure that the colorant is thoroughly incorporated prior to use

CHEMICAL RESISTANCE

For comprehensive chemical resistance information, consult the Chemical Resistant Guide and contact the Technical Service Department.

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.

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.

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.

ArmorSeal Heavy Duty Floor Coatings

ARMORSEAL HS POLYURETHANE FLOOR ENAMEL

PART A B65-220 **SERIES**
PART B B65V220 **HARDENER**

Revised: October 23, 2018

PRODUCT INFORMATION

8.46

PRODUCT DESCRIPTION

ARMORSEAL HS POLYURETHANE FLOOR ENAMEL is a heavy duty, two component, exterior/interior, high solids, polyester-aliphatic urethane industrial floor coating. Provides a high gloss, excellent chemical resistance, color retention, and chalk resistance.

- Outstanding resistance a wide range of chemical, weather, and mechanical conditions
- Abrasion and impact resistant
- Superior exterior color and gloss retention
- Outstanding application properties

PRODUCT CHARACTERISTICS

Finish:	Gloss
Color:	Wide range of colors available
Volume Solids:	71% ± 2%, mixed, may vary by color
Weight Solids:	90% ± 2%, mixed, may vary by color
VOC (EPA Method 24): mixed	Unreduced: <250 g/L; 2.1 lb/gal Reduced 10%: <340 g/L; 2.8 lb/gal
Mix Ratio:	2:1 by volume

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	**3.0** (75)	**4.5** (112)
Dry mils (microns)	**2.0** (50)	**3.0** (75)
~Coverage sq ft/gal (m^2/L)	**380** (9.3)	**570** (14.0)
Theoretical coverage **sq ft/gal** (m^2/L) @ 1 mil / 25 microns dft	**1136** (27.8)	

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

Drying Schedule @ 3.0 mils wet (75 microns):

	@ 50°F/10°C	@ 77°F/25°C *50% RH*	@ 100°F/38°C
To touch:	16 hours	2 hours	30 minutes
To handle:	24 hours	10 hours	2 hours
foot traffic:	24 hours	12 hours	8 hours
heavy traffic:	5 days	72 hours	48 hours
To recoat:			
minimum:	24 hours	12 hours	2 hours
maximum:	3 days	48 hours	24 hours
To cure:	7 days	7 days	5 days

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

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

Pot Life:	5 hours	4 hours	45 minutes
Sweat-in-Time:		None required	

Shelf Life:	Part A: 36 months, unopened Part B: 24 months, unopened Store indoors at 40°F (4.5°C) to 100°F (38°C)
Flash Point:	102°F (39°C), TCC, mixed
Reducer/Clean Up:	Reducer R6K30 or R7K225

RECOMMENDED USES

- For industrial, commercial, or marine floor use where a heavy duty polyurethane floor coating is required
- For use over prepared concrete and steel
- Resists splash, spillage, and fumes of dilute acids, alkalies, solvents, and fuels
- Exterior floors (helipads)
- Auto service centers, computer rooms
- Airport hangars (skydrol resistance)
- Suitable for use in USDA inspected facilities.

PERFORMANCE CHARACTERISTICS

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load	63 mg loss (average of 5 trials)
Adhesion, steel (epoxy primer)	ASTM D3359 Method B; ASTM D4541	5B, 100% Retention (ASTM D3359); 1200 psi (ASTM D4541)
Adhesion, concrete (epoxy primer)	ASTM D4541	350 psi, 100% concrete failure
Direct Impact Resistance	ASTM D2794	100 in. lb.
Dry Heat Resistance	ASTM D2485	200°F (93°C), 250°F (121°C) intermittent
Exterior Durability	2 years at 45° South	Excellent, 87% gloss retention
Flexibility	ASTM D522, 180° bend, 1/4" mandrel	Passes
Humidity Resistance	ASTM D4585, 100°F (38°C), 2000 hours	No blistering, cracking, softening or delamination
Pencil Hardness	ASTM D3363	H
Salt Fog Resistance, with primer	ASTM B117, 1000 hours	Rating 10 per ASTM D610 for rusting, less than 1/16" creepage at scribe. No blistering, cracking, softening, or delamination of the film.
Slip Resistance, Floors	ASTM C1028**, .60 Minimum Static Co-efficient of Friction	Passes wet and dry without SharkGrip Additive, and dry with SharkGrip Additive

**Test method withdrawn in 2014 without replacement

continued on back

ArmorSeal Heavy Duty Floor Coatings

ARMORSEAL HS POLYURETHANE FLOOR ENAMEL

PART A	B65-220	SERIES
PART B	B65V220	HARDENER

Revised: October 23, 2018

PRODUCT INFORMATION

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RECOMMENDED SYSTEMS

		Dry Film Thickness / ct. Mils	(Microns)
Concrete/Wood:			
1 ct.	ArmorSeal 1000HS (reduced 1 pt/gal with R7K54)		
2 cts.	ArmorSeal HS Polyurethane Floor Enamel	2.0-3.0	(50-75)
Steel:			
1 ct.	Recoatable Epoxy Primer	4.0-5.0	(100-125)
2 cts.	ArmorSeal HS Polyurethane Floor Enamel	2.0-3.0	(50-75)
Painted Surfaces in Sound Condition:			
1-2 cts.	ArmorSeal HS Polyurethane Floor Enamel	2.0-3.0	(50-75)

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: SSPC-SP6/NACE 3
* Concrete: 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. SIS055900	SSPC	NACE
White Metal		Sa 3	Sa 3	SP 5	1
Near White Metal		Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast		Sa 2	Sa 2	SP 6	3
Brush-Off Blast		Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	Rusted	C St 2	C St 2	SP 2	-
	Pitted & Rusted	D St 2	D St 2	SP 2	-
Power Tool Cleaning	Rusted	C St 3	C St 3	SP 3	-
	Pitted & Rusted	D St 3	D St 3	SP 3	-

TINTING

Tint Part A with Maxitoner Colorant at 100% tint strength (white tint base and clear tint base only). Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.

APPLICATION CONDITIONS

Temperature:	40°F (4.5°C) minimum, 100°F (38°C) maximum (air, surface, and material) At least 5°F (2.8°C) above dew point
Relative humidity:	75% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:	
Part A:	1 gal (3.78L) and 5 gal (18.9L)
Part B:	1 gal (3.78L) and 5 gal (18.9L)
Weight:	10.45 ± 0.2 lb/gal ; 1.25 Kg/L mixed, may vary with 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.

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.

ArmorSeal Heavy Duty Floor Coatings

ARMORSEAL HS POLYURETHANE FLOOR ENAMEL

PART A	B65-220	SERIES
PART B	B65V220	HARDENER

Revised: October 23, 2018

APPLICATION BULLETIN

8.46

SURFACE PREPARATIONS

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Iron & Steel
Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Commercial Blast Cleaning per SSPC-SP6/NACE 3. For better performance, use Near White Metal Blast Cleaning per SSPC-SP10/NACE 2. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (1-2 mils / 25-50 microns). Prime any bare steel the same day as it is cleaned or before flash rusting occurs. Primer Required.

Concrete and Masonry
For surface preparation, refer to SSPC-SP13/NACE 6, or ICRI No. 310.2R, CSP 1-3. Surfaces should be thoroughly clean and dry. Concrete and mortar must be cured at least 28 days @ 75°F (24°C). Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement and hardeners. Fill bug holes, air pockets and other voids with Steel-Seam FT910. Primer required.

Follow the standard methods listed below when applicable:
ASTM D4258 Standard Practice for Cleaning Concrete.
ASTM D4259 Standard Practice for Abrading Concrete.
ASTM D4260 Standard Practice for Etching Concrete.
ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete.
SSPC-SP 13/Nace 6 Surface Preparation of Concrete.
ICRI No. 310.2R Concrete Surface Preparation.

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 products attacks the previous finish, removal of the previous coating may be necessary. If paint is peeling or badly weathered, clean surface to sound substrate and treat as a new surface as above.

Surface Preparation Standards

	Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal		Sa 3	Sa 3	SP 5	1
Near White Metal		Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast		Sa 2	Sa 2	SP 6	3
Brush-Off Blast		Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	Rusted	C St 2	C St 2	SP 2	-
	Pitted & Rusted	D St 2	D St 2	SP 2	-
Power Tool Cleaning	Rusted	C St 3	C St 3	SP 3	-
	Pitted & Rusted	D St 3	D St 3	SP 3	-

APPLICATION CONDITIONS

Temperature:	40°F (4.5°C) minimum, 100°F (38°C) maximum (air, surface, and material) At least 5°F (2.8°C) above dew point
Relative humidity:	75% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

Reducer/Clean Up ..... Reducer R6K30 or R7K225

Airless Spray
Pressure.....2400 - 3000 psi
Hose.....3/8" ID
Tip .....013" - .017"
Filter.....60 mesh
Reduction.....As needed up to 10% by volume

Conventional Spray
Gun .....Binks 95
Cap 63P
Tip 66
Atomization Pressure.....50 - 60 psi
Fluid Pressure.....20 - 30 psi
Reduction.....As needed up to 10% by volume

Brush
Brush.....Natural Bristle
Reduction.....Not recommended

Roller
Cover .....1/4" woven with solvent resistant core
Reduction.....Not recommended

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

continued on back

ArmorSeal Heavy Duty Floor Coatings

ARMORSEAL HS POLYURETHANE FLOOR ENAMEL

PART A	B65-220	SERIES
PART B	B65V220	HARDENER

Revised: October 23, 2018

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APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly with low speed power agitation. Make certain no pigment remains on the bottom of the can. Then combine two parts 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. Re-stir before using.
If reducer is used, add only after both components have been thoroughly mixed.
If an anti-slip finish is desired, the additive is mixed into the final coat just prior to application. (EXCEPTION: If anti-slip is desired with Clear finish, it should be hand broadcast). A 3/4" pile roller is recommended for the final coat when anti-slip aggregate is used.

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

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	**3.0** (75)	**4.5** (112)
Dry mils (microns)	**2.0** (50)	**3.0** (75)
~Coverage sq ft/gal (m^2/L)	**380** (9.3)	**570** (14.0)
Theoretical coverage **sq ft/gal** (m^2/L) @ 1 mil / 25 microns dft	**1136** (27.8)	

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

Drying Schedule @ 3.0 mils wet (75 microns):

	@ 50°F/10°C	@ 77°F/25°C *50% RH*	@ 100°F/38°C
To touch:	16 hours	2 hours	30 minutes
To handle:	24 hours	10 hours	2 hours
foot traffic:	24 hours	12 hours	8 hours
heavy traffic:	5 days	72 hours	48 hours
To recoat:			
minimum:	24 hours	12 hours	2 hours
maximum:	3 days	48 hours	24 hours
To cure:	7 days	7 days	5 days
Pot Life:	5 hours	4 hours	45 minutes
Sweat-in-Time:		None required	

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

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

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

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Reducer R6K30 or R7K225. Clean tools immediately after use with Reducer R6K30 or R7K225. Follow manufacturer's safety recommendations when using any solvent.

DISCLAIMER

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PERFORMANCE TIPS

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

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle.

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Excessive reduction of material can affect film build, appearance, and adhesion.

Do not apply the material beyond recommended pot life.

Do not mix previously catalyzed material with new.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with Reducer R6K30 or R7K225.

Mixed coating is sensitive to water. Use water traps in all air lines. Moisture contact can reduce pot life and affect gloss and color.

Additive of anti-slip aggregate produces only a light nonslip texture. Product should not be used in place of a nonskid finish when safety is a concern.

Material cannot be sprayed if anti-slip aggregate is used.

Shot blasted floors will require a high build primer.

When rolling this product, always maintain a wet edge to avoid roller marks. Roll as close to any cut-in areas as possible to eliminate visual imperfections. Roller application must be from a roller tray, not by pouring the material onto the surface.

Coated surfaces may discolor under tires due to tire plasticizer migration.

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

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

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WARRANTY

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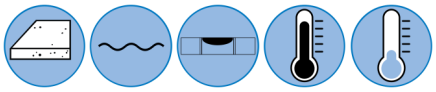
CRACKBOND® JF-311



Product Description

CRACKBOND® JF-311 is a two-component, rapid curing, polyurea joint filler designed for heavy duty traffic and freezer applications. It is solvent free, flexible and with its low viscosity and self-leveling design, allows for 10 - 15 % movement of installed joint width. It may be used in temperatures between -40 °F to 120 °F (-40 °C to 49 °C). **This product is highly sensitive to moisture and cannot be used if any dampness is present!**

General Uses & Applications

- Treats moving cracks
- Used to fill tooled interior/exterior control joints or new construction saw joints on horizontal concrete surfaces
- Protects joint edges from spalling due to wheeled traffic
- For best performance, the maximum joint width is 3/4 in. (19 mm) and joint depth should be a minimum of 3 times the width for industrial floor applications receiving heavy duty vehicle traffic
- Minimum depth can be reduced to 1/2 in. (13 mm), for foot traffic
- May be used for exterior applications when minimal joint movement from thermal cycling will occur
- Keeps joints free of debris and provides a continuous surface for weight loading

Advantages & Features

- Treated joints can be opened to traffic in 90 minutes at 75 °F (24 °C)
- Self-leveling, low viscosity system
- Acceptable for use in USDA inspected facilities
- Wide application and service temperature range, including freezer applications
- The repaired crack or control joint can be shaved or sanded within a minimum of 60 minutes at 75 °F (24 °C)

Availability: Adhesives Technology Corp. (ATC) CRACKBOND products are available through select distributors who can provide you with all your construction needs. Please contact ATC for a distributor near you or visit our website at www.atcepoxy.com to search by zip code.

Color & Ratio: Part A (Resin) Amber: Part B (Hardener) Gray, Mixed Ratio: 1:1 by volume, Mixed Color - Concrete Gray

Storage & Shelf Life: 18 months when stored in unopened containers In dry conditions. Store between 60 °F (16 °C) and 90 °F (32 °C).

Installation: See Manufacturer's Printed Installation Instructions (MPII) available within this Technical Data Sheet (TDS). Due to occasional updates and revisions, always verify that you are using the most current version of the MPII. In order to achieve maximum results, proper installation is imperative.

Clean Up: Always wear appropriate protective equipment such as safety glasses and gloves. Clean uncured materials from tools and equipment using a mild solvent. Cured material can only be removed mechanically.

Limitations & Warnings:

- **Not for use in expansion joints**
- Color varies during cure and may change in exterior applications.
- Substrate and environment must be completely dry with no moisture present prior to application of CRACKBOND JF-311
- Product should not be stored once opened as exposure to moisture greatly reduces shelf life
- Cartridge balancing and crack repair instructions must be strictly followed
- Not intended for exterior or interior joints that are subject to high movement
- Before applying a topcoat, it is recommended that the user check with coating manufacturer for compatibility with polyurea based products as ATC is not responsible for coating incompatibility

IMPORTANT: The user assumes all risks when applying a topcoat. It is recommended to first try a small test area to confirm compatibility and performance. Incompatibility may result in discoloration or adhesion failure of topcoat.

Safety: Please refer to the Safety Data Sheet (SDS) for CRACKBOND JF-311 published on our website or call ATC for more information at 1-800-892-1880.

Specification: Joint filler material shall be a two-component, 1:1 ratio, solvent free polyurea system. The polyurea material must have a tensile strength of 1,200 psi (8.3 MPa) and an elongation of 82 %, per ASTM D412. Cured adhesive shall have a Shore A hardness of 75 – 80 per ASTM D2240. Adhesive shall be CRACKBOND JF-311 from Adhesives Technology Corp., Pompano Beach, Florida.

ORDERING INFORMATION

TABLE 1: CRACKBOND JF-311 Adhesive, Dispensing Tools and Mixing Nozzles[1,2]

Package Size	8.6 oz. (254 ml) Cartridge	21.2 oz. (627 ml) Cartridge	10 Gallon (38 L) Kit
Part #	A9-JF311 12PK	A22-JF311N	B5G-JF311-A B5G-JF311-B
Manual Dispensing Tool	TM9HD	TM22HD	N/A
Pneumatic Dispensing Tool	N/A	TA22HD-A	Pump[3,4]
Case Qty.	12		1
Pallet Qty.	1,116	576	12 kits
Pallet Weight (lbs.)	1,058	1,169	1,178
Recommended Mixing Nozzle	T12		


A9-JF311 12PK


A22-JF311N


T12

1. Call for bulk packaging availability and lead times.
2. One mixing nozzle per cartridge is packaged with 8.6 oz. and 21.2 oz. sizes.
3. For bulk dispensing pumps, contact ATC for recommended manufacturers.
4. Assure proper fit of equipment. Contact ATC for further instructions.


TM9HD


TM22HD


TA22HD-A


One tool, dual grip configurations

MATERIAL SPECIFICATION

TABLE 2: CRACKBOND JF-311 performance to **ASTM C881-14**[1,2,3]

Property	Cure Time	ASTM Standard	Units	Sample Conditioning Temperature 75 °F 24 °C
Gel Time - 60 Gram Mass[4]	----	C881	min	3
Tack Free Cure Time[5] (30 mil Thin Film)	----	D2377	min	28
Mixed Viscosity[6]	----	M2393	cP	500
Pot Life[5,7]	----	----	min	2.5
Tensile Strength	7 day	D412	psi (MPa)	1,200 (8.3)
Tensile Elongation			%	82
Bond Strength	2 day	C882	psi (MPa)	400 (2.8)
Shore A Hardness	----	D2240	----	75 - 80
Adhesion to Concrete	----	D4541	psi (MPa)	275 (1.9)

1. Results based on testing conducted on a representative lot(s) of product. Average results will vary according to the tolerances of the given property.
2. Full cure is listed above to obtain the give properties for each product characteristic.
3. Results may vary due to environmental factors such as temperature, moisture and type of substrate.
4. Gel time may be lower than the minimum required for ASTM C881.
5. Property not referenced in ASTM C881.
6. Mixed viscosity measured at 30 seconds.
7. Pot life is measured as the workable and applicable time of 1.0 gallon (3.8 L) when mixed.

TABLE 3: CRACKBOND JF-311 **CURE SCHEDULE**[1,2,3]

Base Material Temperature °F (°C)	Working Time	Trim/ Shave Time	Full Cure Time
0 (-18)	5 min	6 hr	48 hr
75 (24)	3.5 min	60 min	24 hr
120 (49)	1.5 min	20 min	12 hr

1. Working and full cure times are approximate, may be linearly interpolated between listed temperatures and are based on cartridge/nozzle system performance. Working time is based on material conditioned to 75 °F (24 °C).
2. Application Temperature: Substrate and ambient air temperature should be from -40 to 120 °F (-40 to 49 °C).
3. When ambient or base material temperature falls below 40 °F (4 °C), condition the adhesive to 40 to 85 °F (4 to 29 °C) prior to use.
4. Trim/Shave times are estimates and based on 1/2 in. (13 mm) bead. At -40 °F (-40 °C) trim/shave time is approximately 10 hours.

INSTALLATION INSTRUCTIONS (MPII)

Joint Preparation

- **Do not use in Expansion Joints**; Use for exterior and interior control joints or moving cracks
- Concrete should be at least 28 days old and bonding surface must be dry
- Heavy Duty Traffic Areas: The joint width should be a maximum of 3/4 in. (19 mm); The depth should be a minimum of 3 times the width, or 2.2 in. (57 mm)
- Light Foot Traffic Areas: The joint width should be a maximum of 3/4 in. (19 mm); The depth should be a minimum of 1/2 in. (13 mm)

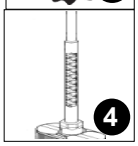
NOTE: CRACKBOND JF-311 is not intended for joints subject to high movement but will accommodate 10 - 15 % movement.

Cartridge Preparation

Shake the cartridge vigorously for 60 seconds, then stand cartridge upright for at least 1 minute allowing any bubbles to rise to the top.

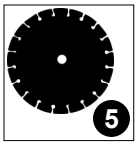
Insert cartridge into the dispenser. Make sure it is properly positioned with the shoulder of the cartridge flush with the front/top bracket of the dispenser. Point upward at a 45° angle. Remove the plastic cap and plug from the top of the cartridge.

IMPORTANT: Before attaching nozzle, balance the cartridge by slowly dispensing a small amount of material into a disposable container until both components flow evenly from the cartridge. Install mixing nozzle onto cartridge.



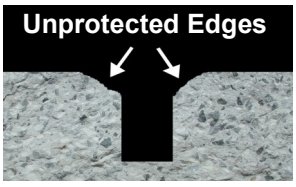
Continue to point the nozzle upward away from yourself and others while slowly applying pressure to dispenser moving any bubbles and product up through the nozzle until it reaches the tip. Dispense the first full stroke of material into disposable container. The cartridge is now purged and ready for use. **NOTE:** Schedule dispensing to consume an entire cartridge at one time with no interruption of flow to prevent material from hardening in mixing nozzle. If you have any problems in dispensing product, replace the nozzle; the product may have begun to cure in the nozzle which will affect the mix ratio. Never transfer a used nozzle to a new cartridge. Repeat the cartridge balancing steps listed above after replacing the nozzle.

Repairing Cracks or Filling Control Joints



Substrate and environment must be **completely dry without any presence of moisture** prior to usage. To fill cracks, use a saw or grinder with a dry diamond or concrete abrasive blade and cut along the crack opening it up to 1/8 in. to 1/4 in. wide. The edges must be a 90° angle to the surface (see Figure 2) to avoid a feathered edge (see Figure 1). See Joint Preparation section above for joint width/depth information. To repair a control joint, fill all spalls with CRACKBOND CSR polyurethane and allow to cure. Recut the control joint to remove all filler materials and to reshape the spall repairs.

Figure 1



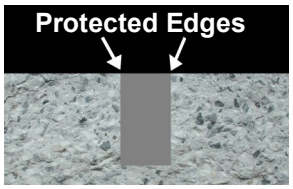
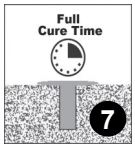


Figure 2

Blow out and remove all dust, dirt, debris, oil and any other contaminant from the control joint or crack. Use backer rod or kiln dried sand prior to application of adhesive. Allow sufficient depth for joint filler based upon minimum recommended depth of filler. Place mixing nozzle directly over the joint or repair area. Dispense material using full smooth trigger pulls (no short, choppy strokes) and allow material to gravity feed into the crack/ joint.



For joints to be shaved, overfill the crack/joint so that material is slightly higher than the face of the concrete slab you are repairing. Allow product to cure for a minimum of 60 minutes at 75 °F (24 °C) then use a sharp floor scraper to shave excess material from top surface. Full cure times are temperature dependent (see Table 3).

TECHNICAL DATA

TABLE 4: CRACKBOND JF-311 **COVERAGE CHART**

Joint Size in. (mm)	Linear Feet per Gallon (Linear Meter per Liter)	Linear Feet per 8.6 oz. Cartridge (Linear Meter per 254 ml Cartridge)	Linear Feet per 21.2 oz. Cartridge (Linear Meter per 627 ml Cartridge)
1/8 x 1 (3.18 x 25.40)	154.0 (12.40)	10.3 (3.14)	25.5 (7.77)
1/8 x 1-1/4 (3.18 x 31.75)	123.2 (9.92)	8.3 (2.53)	20.4 (6.22)
1/8 x 1-1/2 (3.18 x 38.10)	102.7 (8.27)	6.9 (2.10)	17.0 (5.18)
1/8 x 1-3/4 (3.18 x 44.45)	88.0 (7.10)	5.9 (1.80)	14.6 (4.45)
1/8 x 2 (3.18 x 50.80)	77.0 (6.20)	5.2 (1.58)	12.8 (3.90)
3/16 x 3/4 (4.76 x 19.05)	136.9 (11.02)	9.2 (2.80)	22.7 (6.92)
3/16 x 1 (4.76 x 25.40)	102.7 (8.27)	6.9 (2.10)	17.0 (5.18)
3/16 x 1-1/4 (4.76 x 31.75)	82.1 (6.61)	5.5 (1.68)	13.6 (4.15)
3/16 x 1-1/2 (4.76 x 38.10)	68.4 (5.51)	4.6 (1.40)	11.3 (3.44)
3/16 x 1-3/4 (4.76 x 44.45)	58.7 (4.73)	3.9 (1.19)	9.7 (2.96)
3/16 x 2 (4.76 x 50.80)	51.3 (4.13)	3.4 (1.04)	8.5 (2.59)
1/4 x 1 (6.35 x 25.40)	77.0 (6.20)	5.2 (1.58)	12.8 (3.90)
1/4 x 1-1/4 (6.35 x 31.75)	61.6 (4.96)	4.1 (1.25)	10.2 (3.11)
1/4 x 1-1/2 (6.35 x 38.10)	51.3 (4.13)	3.4 (1.04)	8.5 (2.59)
1/4 x 1-3/4 (6.35 x 44.45)	44.0 (3.54)	3.0 (0.91)	7.3 (2.23)
1/4 x 2 (6.35 x 50.80)	38.5 (3.10)	2.6 (0.79)	6.4 (1.95)
1/2 x 1 (12.70 x 25.40)	38.5 (3.10)	2.6 (0.79)	6.4 (1.95)
1/2 x 1-1/4 (12.70 x 31.75)	30.8 (2.48)	2.1 (0.64)	5.1 (1.55)
1/2 x 1-1/2 (12.70 x 38.10)	25.7 (2.10)	1.7 (0.52)	4.3 (1.31)
1/2 x 1-3/4 (12.70 x 44.45)	22.0 (1.77)	1.5 (0.46)	3.6 (1.10)
1/2 x 2 (12.70 x 50.80)	19.3 (1.55)	1.3 (0.40)	3.2 (0.98)
3/4 x 1 (19.05 x 25.40)	25.7 (2.06)	1.7 (0.53)	4.3 (1.31)
3/4 x 1-1/4 (19.05 x 31.75)	20.5 (1.65)	1.4 (0.42)	3.4 (1.04)
3/4 x 1-1/2 (19.05 x 38.10)	17.1 (1.38)	1.1 (0.35)	2.8 (0.85)
3/4 x 1-3/4 (19.05 x 44.45)	14.7 (1.18)	1.0 (0.30)	2.4 (0.73)
3/4 x 2 (19.05 x 50.80)	12.8 (1.03)	0.8 (0.26)	2.1 (0.64)
This is a general table for estimating product usage.			