

PRODUCT INFORMATION

Generic Type	Fast curing ceramic modified epoxy designed for mainline and field pipeline joints and pipeline rehabilitation.
Description	Powercrete R-65/F1-C FBE spray cartridge is a 100% solids liquid epoxy coating with quick cure time for efficient, user-friendly application. Product can be applied on bare steel and fusion bond epoxy. This Manual Application guide gives detailed explanation regarding the use of the cartridge for spray. The use of the spray cartridge is recommended, for rehabilitation, for girth weld area & patching. This Application Guide is specific to 1:1 ratio, 1500 ml and 400 ml spray cartridges used with Sulzer Mixpac-Mixcoat and Plast Pak HSS cartridge sprayer.

PRODUCT DETAILS

Colour	Green and other colours MTO.
Finish	Gloss
Primer	No primer necessary on FBE, liquid epoxy and direct to metal
Dry Film Thickness	25 – 60 mils (625 - 1500 µm) for most applications in multicoat application For higher dry film thickness consult Seal For Life representative.
Solids by Volume	100 %
Theoretical Coverage Rate	64.2 ft ² per Gallon at 25 mils (625 µm) thickness (DFT) 40.1 ft ² per Gallon at 40 mils (1000 µm) thickness (DFT) 26.7 ft ² per Gallon at 60 mils (1500 µm) thickness (DFT)
Severe Exposures	Maximum service temperature 65 ° C (140 °F)
VOC Values	0 g/l (No recordable VOC values)
Limitations	Epoxies lose gloss, discolor and eventually chalk in sunlight exposure. If the coating is going to be exposed more than 6 months a polyurethane or acrylic top-coat is recommended. Consult Seal for Life Representative.

Mixing Ratio	1:1 (A to B in volume)
Packaging	400 ml 1500 ml (1:1 split cartridge)

Spray Equipment and Cartridge Details

Sulzer MixPac MixCoat Spray Equipment	Cartridges & Piston Insertion Device: 400 ml, 1500 ml, 1:1 ratio Application Dispenser: Mixcoat DPS pneumatic spray dispenser Static mixers: MFQ, medium or high flow Number of elements: 24
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Dispensing Settings

Compressed air requirements:

- Flow rate: minimum 14cfm
- Pressure: minimum 90psi, maximum 115 psi

Fluid control dial: set to maximum (Setting 8)
Atomizing air control: set to maximum (Setting 5)

Heating method options:

- Fixed temperature warming box, condition for 24 hours at 140°F (60°C) or
- 700-1250 watt rotating Microwave oven set on high power – times may vary. Initially heat for 2 minutes turning after the first minute. Measure the cartridge temperature with an IR gun at multiple locations on the cartridge. The base side target is 130-140°F (55-60°C)

Cartridge Pre-Heating and Agitation

Minimum temperature: 125°F (50°C)
Maximum temperature: 140°F (60°C)
After heating, manually shake the cartridge for 2-3 minutes to ensure even distribution of heated material.

Note: Heating of POWERCRETE R65/F1 cartridge material by microwave oven has the risk of overheat, distortion/warping of cartridge parts, damage individual components during an excessive heating process, etc.

Short heating periods with temperature checks and agitation in between is the best approach. The applicator assumes all risks associated with that type of heating method.

Cartridge Agitation

After pre-heating step, it is recommended to agitate the cartridges in pneumatic shaker to ensure a uniform distribution of pigments and fillers. Secure the cartridge in the shaker and agitate for 2 –3 minutes or until a uniform colour is observed.

Equipment Setup

- a. Install static mixer:
 - Hold the cartridge upright and remove the end cap.
 - Fit the static mixer tip onto the outlet and twist clockwise to lock in place.
- b. Slide the cartridge into the dispenser.
- c. Connect to air supply
- d. Adjust air pressure, the fluid control dial and atomizing air control as noted in “2. Dispenser settings” above

Safety

Read the POWERCRETE R65/F1 Product Data Sheet and Safety Data Sheet (SDS) and follow any cautionary statements. Personnel who will be exposed to R65/F1 product, must wear appropriate personal protection equipment (PPE). Read and follow instructions on the Sulzer equipment operation and safety literature. Follow local and national safety guidelines.

Always

- Use protective eye and ear equipment when operating.
- Wear a face mask or respirator when operating.
- Test the forward/reverse function before loading a cartridge.
- Disconnect the air supply before starting any maintenance/cleaning tasks.
- Make sure cartridge is loaded properly.
- Use a new static mixer.
- Read the material manufacturer’s instructions carefully.
- Make sure you have not cross-contaminated the contents of the two cartridges as it may have cured in one of the sides.

Do Not

- Connect the applicator to an air supply that can exceed 115 psi.
- Immerse the gun in solvent.
- Operate the gun with loose, broken, or missing parts.
- Carry the gun by the air pipe.
- Use damaged cartridges or the wrong type of cartridge in the applicator.
- Point the applicator at another person.
- Disassemble the handle and adjust the safety valve inside.
- Use a static mixer that has material inside it that has cured.
- Use partially extruded cartridges unless you use a new static mixer and know there is no cross-contamination.

- Use expired material or material that has cured.

Maintenance Daily: Wipe the applicator using the material manufacturer’s recommended solvent before it has time to set up. Special care should be taken to make sure no residue is left on the rods.
Weekly: Check the plungers and all external bolts and screws are tight. Tighten if found to be loose.
Monthly: Lubrication of internal pistons and seals. Place 3 drops of oil on the air inlet at the air regulator. Re-connect the air line and when next operated, the compressed air will blow the oil into the inner workings of the gun.

SUBSTRATE AND SURFACE PREPARATION

General	The area to be coated must be clean, dry, and free from oil, grease, and dust. All contamination that could interfere with the adhesion of the coating has to be removed according to SSPC-SP1.
Preventing Condensation	Prior and during the surface preparation, the temperature of the substrate(s) must be at least 5°F (3°C) above the dew point.
Solvent Cleaning	If necessary, use Acetone, MEK or IPA and ensure that the surface is dry and clean.
Preheating Option	The surface must be at least 5°F (3°C) above dew point to prevent surface moisture. Preheating may be useful to eliminate moisture prior to abrasive blasting and accelerate curing. Preheat the area to be coated to approximately 122° F (50°C) prior to blasting. To accelerate curing, preheat the area to a maximum of 176°F (80°C).
Steel	Abrasive blast to SSPC SP 10 (ISO Sa 2½ a minimum cleanliness level. The anchor profile shall be angular with a range of 2.5 – 4.5 mils (67 to 112 µm) when measure by ASTM D 4417 Method C (Replica Tape).
FBE	Abrasive blast surface following procedures of SSPC SP 7 (ISO Sa 1) removing all the gloss from the surface and obtaining a dense angular profile. The anchor profile can be evaluated following procedures of ASTM D 4417 Method C (Replica Tape) obtaining a minimum of 2.0 mils (50 µm).

APPLICATION EQUIPMENT GUIDELINES

Equipment Setup Load and set up spray equipment as described in the Spray Equipment and Cartridge Details section above.

**Masking & Adjacent
Surface Protection
Spraying**

Mask off areas adjacent to the section to be coated and protect adjacent surfaces against overspray.

To achieve on-ratio mixing, point the cartridge up and slowly dispense material into the static mixer by repeated short/brief triggering until mixer tube is full. Point spray nozzle into a slop bucket and dispense at least the first 6-8 inches (15-20 cm) of unmixed material into the bucket (2.0-3.5 fl oz). Repeat this process at the beginning of each new or partially-used cartridge. Set the Cartridge temperature for both components at 110 – 150 °F (45 – 65 °C).

It is very important that the fluid delivery speed be set to no less than medium-fast setting. Too low of a fluid pressure setting and/or too cool cartridge material will result in improper/inadequate mixing of A and B components, poor to unacceptable spray property, and inconsistent polymerization.

Using a large piece of cardboard or plastic, test spray to ensure flow and coverage is as desired. Continue immediately to the area to be coated and spray in smooth even strokes to achieve consistent coating thickness. Perform thickness checks as required.

Spray Start and Finish

Always start and finish spraying away from the surface to be coated to avoid small amounts of off ratio material being applied.

Un Used Material

If the complete cartridge has not been fully used, remove the mixer nozzle immediately and replace the end cap to avoid plugging the tip. A new nozzle will be required for the next application.

Disposal

Dispose of empty used cartridges according to local regulations.

APPLICATION CONDITIONS

	Product	Surface	Ambient	Humidity
Optimum	120°F* (48°C)	70-90°F (21-32°C)	70-90°F (21-32°C)	25-50%
Minimum	110°F (45°C)	50°F (10°C)*	35°F (2°C)	0%
Maximum	150°F (65°C)	176°F (80°C)	120°F (49°C)	85%

* If the surface to be coated is below 10°C (50°F), preheating of the substrate is recommended. Preheat temperatures should not exceed 93°C (200°F). Prior and during the application, the temperature of the substrate must be at least 3°C above the dew point.

*This temperature does not refer to hand application.

Curing Schedule

Gel Time 9 minutes at 25 °C (77 °F)

Dry to Touch 37 minutes at 25 °C (77 °F)

65 Shore D Hardness 1 hour at 25 °C (77 °F) – Ready for Holiday Testing

75 Shore D Hardness 1.25 hours at 25 °C (77 °F) – Full Cure ready for handle

Recoat Interval 8 – 28 minutes at 21 °C (70 °F)

Note Cure time is based on 40 mils (1000micron) DFT. Recoat interval at 21°C (70°F) is 26 – 83 minutes and 7-10 minutes at 65°C (150°F).

Consult POWERCRETE® R65/F1 Gel, Re-Coat and Curing Time Chart for more specific information.

Warning: Under 4 °C (40 °F) coating mixture is frozen, and no chemical reaction will occur.

Temperature	Gel Time	Min. Recoat Time	Max. Recoat Time	Dry to Touch	Time to 65 Shore D	Time to 75 Shore D
50 °F (10 °C)	20 min	12 min	1 hrs	2.1 hrs	7 hrs	10 hrs
60 °F (16 °C)	13 min	10 min	50 min	1.25 hrs	3 hrs	4 hrs
70 °F (21 °C)	11 min	9 min	28 min	38 min	1.5 hrs	1.75 hrs
77 °F (25 °C)	9 min	8 min	17 min	25 min	55 min	1.1 hrs
80 °F (27 °C)	8 min	6 min	13 min	23 min	50 min	1 hrs
90 °F (32 °C)	7 min	5 min	10 min	14 min	22 min	34 min
100°F (38 °C)	6 min	4 min	9 min	11 min	19 min	27 min
110°F (43 °C)	5 min	3 min	6 min	9 min	17 min	20 min

This information refers to spray application, the cure rate accelerates as temperature and dry film thickness increase. Touch-up of holidays can occur then as well or any time the coating is firm enough to resist damage from the procedure. Full cure will take place according to the table above. Over-coating after the maximum recoat time requires that the surface be abraded prior to application. Use a medium grit, 60 to 80 grit paper or sweep blast to roughen the surface. Clean abraded area of dust before re-coat or repair. (For more information consult the Cure-Gel Time chart for Powercrete® R65/F1)

INSPECTION AND REPAIR

Pipe Handling	Transport and stacking of pipe is possible after full cure of the coating and completion of Holiday testing according to NACE SP0188. This time may be reduced by increasing the curing temperature. Consult the Powercrete® product data sheet for specific information.
Inspection	The finished coating must be visually inspected for any defects, such as runs and sags, fisheyes, blistering, pinholes, missed spots and possible contaminants. Pinhole/Holiday detection must generate according to NACE SP0188 High Voltage Modality or specified standard.
Coating Thickness	The coating thickness (DFT) must be within the specified DFT range. Use calibrated equipment and measure according to SSPC-PA 2 or another specified standard.
Cure to Handling	Transport and stacking is possible after full cure of the coating and generating a Holiday test (NACE SP0188). This time can be reduced by increasing the curing temperature. Consult Seal For Life for specific information.
Repair	Pinholes/Holidays must be located and repaired with Powercrete® R65/F1, or approved material. Consult Powercrete® for specific information. Retest the repaired area. Consult the POWERCRETE® R65/F1 Repair Instructions.

CLEAN UP AND SAFETY

Cleaning	Use MEK, Acetone or Xylene/MEK mixtures. In case of spillage, absorb and dispose of in accordance with local applicable regulations
Safety	Read and follow all caution statements on this product data sheet and on the SDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands, and all exposed areas.
Ventilation	When use cleaning solvent in enclosed areas, thorough air circulation must be used. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines.

PACKAGING, HANDLING AND STORAGE

Shelf Life	Store indoor, clean and dry, away from direct sunlight in a cool place. Keep from freezing. Shelf life 6 months in the original unopened containers. The material should be use within 6 months of packaging.
Storage Temperature and Humidity	18-30°C (65-85°F)
Storage	Indoors and keep dry
Shipping Weight	Powercrete® R65/F1 Product dimensions and contents: Cartridge 1500 ml Cartridge 400 ml
Flash Point	Mixed Material >446°F (230 °C) mixed product Part A > 199°F (93°C) Part B > 199°F (93°C)

ADDITIONAL INFORMATION

Documentation	Application instructions and other documentation can be obtained by contacting our head office, from our local distributor or by sending email to info@sealforlife.com
Certified staff	Application of the described coating system should be carried out and inspected by certified personnel.

DISCLAIMER

Seal For Life Industries warrants that the product(s) represented within conform(s) to its/their chemical and physical description and is appropriate for the use as stated on the respective technical data sheet when used in compliance with Seal For Life Industries written instructions. Since many installation factors are beyond the control of Seal For Life Industries, the user is obligated to determine the suitability of the products for the intended use and assume all risks and liabilities in connection herewith. Seal For Life Industries liability is stated in the standard terms and conditions of sale. Seal For Life Industries makes no other warranty either expressed or implied. All information contained in the respective technical data sheet(s) should be used as a guide and is subject to change without notice. This document supersedes all previous revisions. Please see revision date on the left. Powercrete® is a registered trademark of Seal For Life Industries.