



REMR Material Data Sheet CM-PC-1.35

CONCRETE PATCHING MATERIALS: VERSAFILL
60A/60B

1. NAME

VERSAFILL 60A/60B

2. MANUFACTURER

Henkel Polymers Division
5325 South 9th Avenue
LaGrange, IL 60525-3602
Telephone:

3. DESCRIPTION

VERSAFILL 60A/60B is a two-component epoxy resin system designed to penetrate and bond cracks in concrete structures. The manufacturer states that cracks in concrete can be filled with the epoxy resin by simple gravity feed. The epoxy resin can also be pressure injected into cracks. The manufacturer claims that the epoxy resin has a "built-in" high affinity to concrete that enables the material to penetrate deeply into a crack.

4. USES

VERSAFILL 60A/60B is used for bonding cracks in bridge decks, parking decks, and most horizontal concrete slab structures. It can also be injected into vertical concrete structures.

5. MANUFACTURER'S TECHNICAL DATA

VERSAFILL 60A/60B has low odor and contains no solvents. The mixing ratio of the two components is 80 percent Component A to 20 percent Component B by weight.

Physical Characteristics of Components

	60A	60B
	<u>Epoxy Resin</u>	<u>Epoxy Curing Agent</u>
Lb/gal	9.25	8.25
Viscosity	6.5 poise	0.20 poise
Appearance	Cloudy off-white	Clear

Mixed Properties

Lb/gal	9.0
Viscosity, poise	3.0-5.0
Appearance	Cloudy off-white
Gel time (200 g mass)	60 min

Cured Properties

Compressive strength (ASTM D 695)	5,160 psi
Tensile strength (ASTM D 638)	4,250 psi
Elongation (ASTM D 638)	9.9 percent
Flexural strength (ASTM D 790)	5,620 psi
Flexural modulus of elasticity (ASTM D 790)	203,680 psi
Heat distortion temperature (ASTM D 648)	44.4°C
Shore D hardness	80

6. MANUFACTURER'S GUIDANCE FOR APPLICATION

Surface preparation: Substrate surface and cracks must be free of any standing water. Though VERSAFILL 60A/60B will cure in damp conditions, it

is advisable that the substrate be dry throughout to ensure excellent bonding. Surface and cracks must be free of oil, grease, waxes, curing compounds and any debris that could act to inhibit the material from wetting out the substrate. Any surface contamination should be removed by mechanical means, after which the surface and cracks should be swept clean. High pressure water has been found to be effective for removing debris from crack openings.

Mixing: To assure product consistency, thoroughly mix VERSAFILL 60A and 60B separately before adding to mixing vessel. The required amounts of VERSAFILL 60A and 60B should be emptied into a mixing vessel. If the material is not purchased in kit form, then refer to the VERSAFILL 60A/60B product data sheet for mix ratios. The material should be mixed thoroughly using a mechanical paddle-type mixer.

Application: VERSAFILL 60A/60B can be applied to the substrate surface by using either a roller or a squeegee. The material should be worked over the crack for 5 to 10 min to ensure good penetration. Larger cracks may require "capping off" by filling the crack with sand or by mixing sand directly into the VERSAFILL 60A/60B, forming a mortar, and then applying it into the crack using a trowel. NOTE: These larger cracks should first be filled with straight VERSAFILL 60A/60B so that material can penetrate into the lower thinner body of the crack.

Since residual material will be left on the surface, it is advisable to broadcast sand into the uncured VERSAFILL 60A/60B assuring a nonskid surface after the material has cured.

Curing limitations: Material should not be used in conditions where substrate or air temperature is below 45°F. Also note that material will

cure at a slower rate in colder temperatures. Altering mix ratios will not affect the speed of cure but will adversely affect product performance.

Recoating should be performed no more than 24 hr after application of VERSAFILL 60A/60B. A greasy film (due to amine blush) might be seen after VERSAFILL 60A/60B has cured. This can be washed off with a detergent/water solution or solvent. This should be done after the surface is cured and hard. It is advisable that any blush be removed prior to recoating.

7. CORPS OF ENGINEERS' EVALUATION

<u>Property</u>	<u>Test Method</u>	<u>Results</u>
Gel time, 73°F, min	ASTM C 881	65
Viscosity, mixed, cP	ASTM D 2393	360
Bond to concrete, psi	ASTM C 882	>3,900 ^{*-1}
Bond to wet concrete, psi ^{*-2}	ASTM C 882	1,300
Total solids, 50°C, %	ASTM D 1259	99.9

*-1 Concrete failure.

*-2 Tested as a Grade 1 system given in ASTM C 882 except that the test specimens were soaked in water 24 hr before pouring the epoxy resin into the joint.

Penetration of the epoxy resin into narrow cracks was evaluated by pouring the epoxy resin on top of 8- by 12- by 3-in. mortar prisms that contained cracks. Cracks were created in the mortar by casting the mortar into plastic molds and bending the molds 5 to 6 hr after casting. Crack openings on the sides and bottom were sealed with hot wax. Concrete beams were broken under flexural load and placed

back together to form cracks. Penetration into cracks was determined by cutting and breaking apart the test specimens and visually examining the penetration into cracks by hand lens and low power microscopes. Good penetration was observed, and cracks as narrow as 0.004 in. were filled with the epoxy resin. When pouring the epoxy resin on top of the crack in the beams, it took 6 to 8 min to penetrate the 4-1/2-in. depth of the beam.

8. ENVIRONMENTAL CONSIDERATIONS

Reasonable caution should guide the preparation, repair, and cleanup phases of activities involving potentially hazardous and toxic chemical substances. Manufacturer's recommendations to protect occupational health and environmental quality should be carefully followed. Material safety data sheets must be obtained from the manufacturers of such materials. In cases where the effects of a chemical substance on occupational health or environmental quality are unknown, chemical substances should be treated as potentially hazardous toxic materials.

9. AVAILABILITY & COST

The epoxy resin is available from the manufacturer. Contact Henkel Polymers Division for pricing.