

Starting Formulation

SF 5002

Patching and Resurfacing Compound for Exterior Concrete EPON™ Resin 8131 / EPIKURE™ Curing Agent 3072

Introduction This sand-filled formulation illustrates the use of flexibilizing epoxy resins to impart thermal compatibility with exterior concrete applications including patching of slab and joint spalls, skid-proofing loading docks and ramps, crack sealing and waterproofing, grout bonding of pre-cast concrete supports, and grouting of recessed electrical wiring, posts, tie-down fixtures, etc. Compliance with requirements of ASTM specification C-881, Type III, Class C is indicated by test data developed from this formulation.

Formula	Material	Supplier	Pounds	Gallons
Part A				
	EPON Resin 8131	Hexion	100	11.00
Part B				
	EPIKURE Curing Agent 3072	Hexion	26	3.17
Aggregate Portion				
	Silica Sand ¹		<u>755</u>	<u>34.20</u>
		Total	881	48.37

¹Sand should be graded for good packing and troweling characteristics, dry and available in convenient standard weight bags.

The following sieve analysis is characteristic of sands which will trowel well:

Sieve No.	Percent Retained
6	0
8	0-10
16	10-20
30	25-35
50	35-45
100	5-15

Formula Variations Resin Portion

Blend pigment pastes into the resin to impart color and hiding power. Air release agents such as DC-200 Fluid (Dow-Corning Corp.) and PC-1344 (Monsanto Co.) can be incorporated at levels of 50 to 70 parts per million of resin to facilitate release of bubbles entrapped during mixing and decrease the porosity of the topping. Thixotropes such as fumed silica can be incorporated at concentrations of 2 to 5 phr to impart non-sag characteristics for vertical applications.

Converter Portion

For convenience, nonylphenol can be blended with EPIKURE Curing Agent 3072 to increase the volume combining ratio to 2:1. Blending EPIKURE Curing Agent 3271 with EPIKURE Curing Agent 3072 provides higher reactivity for cool weather applications. Blends of EPIKURE Curing Agent 3055 with EPIKURE Curing Agent 3072 provide a longer working life for hot weather applications.

Aggregate Portion

Mix pea gravel with sand and combine with the binder at weight ratios of 7 or 8:1 for filling of holes over 1-inch deep. Substitute ceramic coated sand granules, such as Colorquartz (3M Co.), for sand when a decorative effect is desired. A blend of grade 11 and grade 28 particle sizes is suggested for best spreading and troweling properties. Abrasives such as crushed garnet, aluminum oxide, and Carborundum can be broadcast over ungelled coatings or toppings of this composition to provide a non-polishing, skid-proof surface.

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coatings or toppings of this composition to provide a non-slip, skid-proof surface.

Typical Handling Properties Clean old concrete substrates by either sandblasting or scarification using care to remove surface contaminants such as oils, fats, greases, waxes or membrane coating paints. The laitance on new concrete can be removed by a muriatic acid etch, followed by thoroughly flushing with water, then scrubbing and drying.

To ensure maximum adhesion, apply a primer coating of the unfilled binder (mix the resin and converter portions) to the concrete by brush, roller or squeegee. A coverage rate of 160 square feet per gallon (average film thickness of 10 mils) is suggested for all but highly porous substrates, where heavier application may be required. Apply the sand-filled patching compound or topping before the primer coating has gelled.

Prepare the sand-filled system by first blending the resin and converter portions in the designated ratio and mixing until homogeneous. If manual stirring is used, frequently scrape the sides and bottom of the container to insure complete blending. Pour the binder over the sand and mix in a KOL Mixal paddle-type mortar mixer, or with a drill motor powered agitator.

Fill or spread the sand/binder mix to the approximate thickness desired and finish trowel. This provides additional working life by permitting the heat of reaction to dissipate from the thinner sections.

For skid-proof coatings and toppings, modify this procedure to include broadcasting of abrasive grains over the ungelled coating or topping. When the epoxy hardens, the excess, unwetted grains are swept off.

Typical Properties Table 1 / Typical Properties

	<u>Units</u>	<u>Value</u>
Combining ratio, by weight		
Resin/Converter		100 : 26
Sand/Binder		6 : 1
Viscosity at 25 °C, binder	cP	1,200
Density, unfilled binder	lbs/gal	8.9
Density, sand-filled system	lbs/gal	18.3

	<u>Units</u>	<u>at 13 °C</u>	<u>at 25 °C</u>	<u>at 38 °C</u>
Pot life, ¹	hrs	1.25	0.75	0.25
Expected working life, ²	hrs	2.25	1.5	0.75
Set time, ³	hrs	16.0	6.5	3.0

¹ Pot Life based on 1-quart of binder.

² Working Life based on the sand filled system.

³ Set time based on 1/4-inch thick topping.

Typical Cure Properties Table 2/Typical cured state properties for unfilled binder and sand-filled binder systems

	<u>Units</u>	<u>Unfilled binder</u>	<u>Sand-filled binder</u>
Tensile strength	psi	2,400	1,500

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Tensile elongation	%	25	—
Compressive yield strength	psi	2,100	6,500
Izod impact, notch	ft•lb/inch	0.95	—
Hardness	Shore D	71	—
Water absorption, 24 hrs at 25 °C	%	0.54	—
Weight loss, 24 hrs at 60 °C	%	0.1	<0.1
Glass bow shrinkage, divergence	inches	0.0301	—
Coefficient of linear thermal expansion, 10-6 inch/inch	°C	169	59
Tensile bond strength			
Dry concrete	psi	>320	>320
Damp concrete	psi	>320	>320
Aged concrete ²	psi	—	>320
Thermal compatibility, per ASTM C-884		—	Pass

¹ The glass bow shrinkage meets the requirements of ASTM C-883.

² 1/4-inch thick topping was weathered for 5 years on a ground level slab (plant driveway in Louisville, KY).

Storage Recommendations regarding storage conditions can be obtained by visiting our web site at www.hexion.com

General Information

These are starting formulations and are not proven in the user's particular application but are simply meant to demonstrate the efficacy of the products and to assist in the development of the user's own formulation. It is the user's responsibility to fully-test and qualify the formulation, along with the ingredients, methods, applications or equipment identified herein ("Information"), by the user's knowledgeable formulator or scientist, and to determine the appropriate use conditions and legal restrictions, prior to use of any Information.

Safety, Storage & Handling

Please refer to the MSDS for the most current Safety and Handling information.

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