

## SUBSTRATE PREPARATION MATERIALS

### CEMENTITIOUS REPAIR MORTARS

Quick-dry modified Portland cement-based mortars are typically used to repair surface defects in concrete and masonry substrates, and to re-pitch substrate surfaces. Repairs in excess of 1" in depth often utilize pea gravel mixed with the mortar. Similar products are available that can be used to repair stone, terra cotta, and brick. A selection of materials is listed.

### POLYURETHANE SEALANT

Single-component, gun-grade polyurethane sealant is typically used to seal cracks and voids in a variety of substrates. Urethane sealant can also be used with backer rod to fill gaps between building components, and to achieve a smooth transition at uneven locations. A selection of materials is listed.

### KEMPEROL EP AND EP5 PRIMERS WITH KILN-DRIED SAND

A repair mortar or slurry can be created by mixing Kemperol epoxy-based primers with kiln-dried mixing sand. The mix ratio can be varied to suit the site condition, eg., from 1:4 (1 part primer to 4 parts sand) for repair of surface defects such as spalls, to a ratio of 1:1 for a slurry repair over an uneven substrate surface.

**NOTE: Intended for use with concrete, masonry, and stone substrates.**

### KEMPEROL D AND R PRIMERS WITH KILN-DRIED SAND

A repair mortar or slurry can be created by mixing Kemperol urethane-based primers with kiln-dried mixing sand. The mix ratio can be varied to suit the site condition, eg., from 1:4 (1 part primer to 4 parts sand) for repair of deep surface defects such as gaps and gouges, to a ratio of 1:1 for a slurry repair over an uneven substrate surface.

**NOTE: Intended for use with metal and wood substrates.**

### KEMPEROL MIXING SAND

Kiln-dried #00 graded quartz sand suitable for mixing with epoxy and urethane primers to create repair mortars and slurries for use in substrate preparation.

**NOTE: Do not use as surfacing sand.**

**NOTE: MATERIAL SAFETY DATA SHEETS FOR ALL KEMPER SYSTEM, INC. PRODUCTS ARE AVAILABLE ON THE [kempersystem.net](http://kempersystem.net) WEBSITE.**

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## **Substrate Repair & Patching Materials**

Substrate damage that may be structural in nature must be evaluated by a licensed professional architect or engineer. Repair of structural damage is not addressed by this manual and is not the responsibility of Kemper System, Inc.

### **CEMENTITIOUS PATCHING MATERIALS**

The substrate repair and patching materials described below have been used by the trade in the field in conjunction with Kemperol materials, and been found to be acceptable for substrate leveling and patching. The cure times shown are minimum days required, and may vary depending upon temperature and relative humidity. This is not intended to be a comprehensive list; other repair materials of similar composition are likely to provide acceptable results. After placement of the patch or infill materials, most surfaces must be mechanically ground, bartered, sandblasted or scarified to remove any cementitious laitance (the weak surface which occurs during the placement and setting process) and other contaminants.

Repair of concrete substrate is dependent on the type of extent of the deterioration. The following are basic types of repair materials, a combination of which may be required to achieve proper repair.

#### **Bonding Agent/Rebar Coating**

Emaco P24 (MBT)

Requires subsequent application of Manufacturer's surfacing or repair mortar.

Armatec 110 EpoCem (Sika)

Requires subsequent application of Manufacturer's surfacing or repair mortar.

#### **Profiling/Surface Repair Mortar**

Emaco R300 CI (MBT)

Single-component polymer modified repair mortar for surface repairs of minimum 1/8", maximum 1/4" thickness. Typical 3-7-day curing required prior to Kemperol primer application.

Sikatop 121 PLUS (Sika)

Two-component polymer modified repair mortar for surface repairs of minimum 1/12", maximum 1/6" thickness. Typical 3-7-day curing required prior to Kemperol primer application.

#### **Horizontal/Vertical Repair Mortar**

Emaco R310 CI (MBT)

Single-component polymer modified repair mortar for surface repairs of minimum 1/4", maximum 1" (per lift) thickness. Can be extended 3/8" pea gravel for repairs of greater depth. Typical 3-7-day curing required prior to Kemperol primer application.

### SikaTop 122 PLUS (Sika)

Two-component polymer modified repair mortar for surface repairs of minimum 1/8", maximum 1" (per lift) thickness. Can be extended 3/8" pea gravel, for a minimum 1", maximum 4" (per lift) thickness. Typical 3-7-day curing required prior to Kemperol primer application.

### SikaRepair 222 (Sika)

One- or two-component modified repair mortar for surface repairs of minimum 1/4", maximum 1" (per lift) thickness. Can be extended 3/8" pea gravel for repairs of greater depth. Typical 3-7-day curing required prior to Kemperol primer application.

### Emaco 10-61 Rapid Mortar

Single-component modified repair mortar for surface repairs of minimum 1/2", maximum 2" (per lift) thickness. Can be extended 3/8" pea gravel for repairs of greater depth. Typical 24 hour curing required prior to Kemperol primer application.

### SikaQuick 2500 (Sika)

Single-component polymer modified repair mortar for surface repairs of minimum 1/4", maximum 1" (per lift) thickness. Can be extended 3/8" pea gravel for repairs of greater depth. Typical 4-8 hour curing required prior to Kemperol primer application.

### **Vertical/Overhead Repair Mortar**

#### Emaco R350 CI (MBT)

Single-component polymer modified repair mortar for surface repairs of minimum 1/4", maximum 1-1/2" (per lift) thickness. Typical 3-7-day curing required prior to Kemperol primer application.

### SikaTop 123 PLUS (Sika)

Two-component polymer modified repair mortar for surface repairs of minimum 1/8", maximum 1-1/2" (per lift) thickness. Typical 3-7-day curing required prior to Kemperol primer application.

### SikaRepair 223 (Sika)

One- or two-component modified repair mortar for surface repairs of minimum 1/4", maximum 1" (per lift) thickness. Typical 3-7-day curing required prior to Kemperol primer application.

### **BRICK, STONE, AND TERRA COTTA PATCHING MATERIALS**

Repair of brick, stone, and terra cotta substrate is dependent on the type of substrate material, the extent of the deterioration, and whether or not the repair needs to match the appearance of the substrate.

Repair materials indeed for use with concrete substrates are normally not appropriate for use with brick, stone, and terra cotta.

The following are basic types of repair and restoration materials recommended by the listed manufacturers for each substrate type. However, as these are specialty materials, close consultation with the material manufacturers is recommended. The use of associated surface cleaners and bonding agents may be required to achieve satisfactory results.

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### **Limestone/Sandstone Repair Mortar**

John M70 (Cathedral Stone Products)

Custom System 45 (Edison Coatings)

### **Brick/Terra Cotta Repair Mortar**

John M100 (Cathedral Stone Products)

Custom System 45 (Edison Coatings)

### **Marble Repair Mortar**

John M120 (Cathedral Stone Products)

Custom System 45 (Edison Coatings)

### **Granite/Bluestone Repair Mortar**

John M160 (Cathedral Stone Products)

Custom System 45 (Edison Coatings)

### **UNIVERSAL REPAIR MATERIAL/SEALANT**

Repair of small cracks, gaps and joints in most substrate materials can be made by using a high-quality single component gun-grade urethane sealant. ***Silicone-based sealants are not acceptable.***

Deep cracks will require the use of a backer rod prior to the application of the urethane sealant material. The sealant must be smoothed out flush with the substrate; tooling is not required.

The intent is to prevent the loss of liquid primer and resin materials, and to achieve a continuous substrate surface that will provide full support of the Kemper membrane system.

### **Urethane Sealant**

Sikaflex-1a (Sika)

Sonneborn NP1 (Sonneborn)

DynaTrol 1-XL (Pecora)

04/08

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