

## **I. CONTENT**

### **1. Application materials**

### **2. Tools**

### **3. Installation Method**

#### **3.1 Preparing the substrate**

#### **3.2 Preparing the slabs**

#### **3.3 Preparing the mix**

#### **3.4 Installation steps**

##### **3.4.1 Laying the Tiles**

##### **3.4.2 Grouting**

#### **3.5 Cleaning**

### **4. Technical Specification of Application Materials**

### **5. Maintenance**

#### **5.1 Surface Maintenance**

#### **5.2 Daily Maintenance**

## 1. APPLICATION MATERIALS

The choice of which type of adhesive to use when installing stone material must be made according to their dimensional stability, sensitivity to water and to thermal variations. Furthermore, some stones, in the presence of extra water rising up from the substrate, or from the adhesive, can be stained and/or present unsightly blemishes.

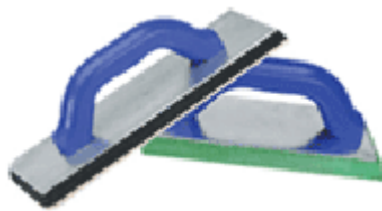
There are a lot of materials that can be used, some are shown below.

Company	Product Name	Characteristic	Note
KERAKOLL	Super flex	2 parts Adhesive (Polyurethane)	Adhesive
	Fugabellaepoxy	2 parts grouting (epoxy)	Grouting
LATICRETE	Latapoxy 300 pav	2 parts Adhesive (Polyurethane)	Floor Adhesive
	Latapoxy 300 vert	2 parts Adhesive (Polyurethane)	Wall adhesive
	Latapoxy SP 100 pav	3 parts grouting (epoxy)	Floor Grouting
	Latapoxy SP 100 vert	3 parts grouting (epoxy)	Wall Grouting
MAPEI	Granirapid	Quick-hardening	Adhesive & Grouting
	Keraquick (mix with Latex Plus)	Quick-hardening	Adhesive
	Keracrete+Keracrete Podew	2 parts cimentitious adhesive	Adhesive
	Keraflex Maxi	Cementitious adhesive	Adhesive
	UP 71	2 parts Adhesive (Polyurethane)	Adhesive
	Keralastic	2 parts Adhesive (Polyurethane)	Adhesive
	Kerapoxy	2 parts Adhesive (Polyurethane)	Grouting
TECHNOKOLLA	All 900	2 parts Adhesive (Polyurethane)	Adhesive
	Epostuck	2 parts grouting (epoxy)	Grouting

2. TOOLS



Mixing Drill and Paddles



Rubber trowel for grouting joints



Notched Trowel



Special sponge for cleaning grout



Rubber Hammer

### 3. INSTALLATION METHOD

#### 3.1 Preparing the substrate.

All substrates must be flat, mechanically strong, free from loose parts, grease, oil, paint, wax, and free of cracks. The surface must not come into contact with chlorinated water.

Cements substrates must not be subject to shrinkage after the installation of the tiles. During warm weather, renders must be cured at least 1 week per centimeter of thickness.

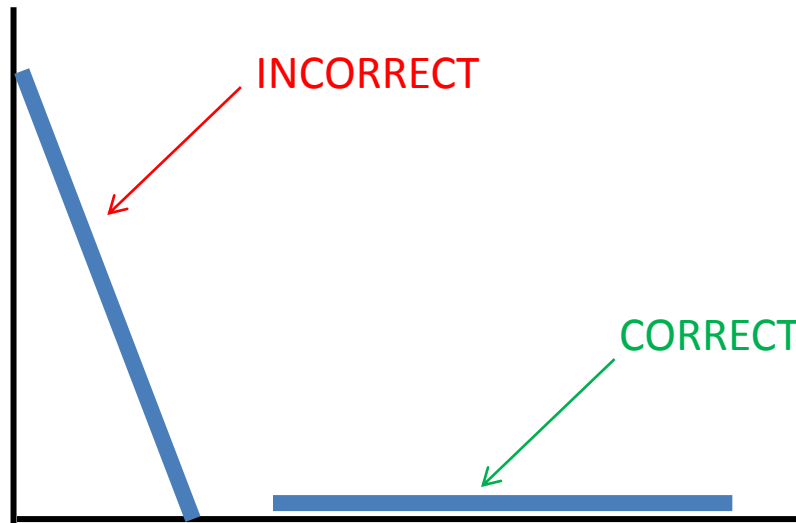
The ambient temperature must be between 10°C (50°F) and 35°C (95°F) for correct laying operations to be performed. Operating in temperatures outside this range can have negative effects. If the temperature is too low it could prevent or greatly retard the drying of adhesives. Alternately if the temperature is too high, the adhesive can dry too quickly.

Should surfaces become too warm due to direct exposure to sunlight dampen the surfaces with water to cool them down.

Gypsum substrates and anhydrite screeds must be perfectly dry (maximum residual moisture 0.5%), sufficiently hard and free from dust. It is absolutely essential that they be treated with Primer G or Mapeprim SP. In areas subject to extreme damp, prime the substrate with Primer S.

#### 3.2 Preparing the panels or tiles.

All material must be clean, dry, and free from dust and cracks. Any grease, paint, dust, or other pollutants must be cleaned off prior to installation. If panels are stored vertically, their reduced thickness could cause a slight "warping". Always make sure they are positioned on a completely flat surface



***If panels become "warped" due to incorrect positioning, take 5-7 panels and stack them on a flat surface. After a few hours they will become flat again.***

### **3.3 Preparing the mortar for laying**

The adhesive must be mixed in accordance with the manufacturer's instructions.

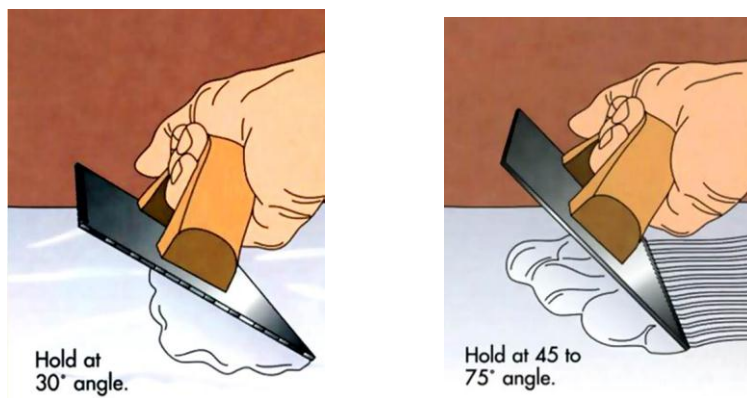
When using the drill and paddles, make sure that the mortar is homogeneous and not curdled. In order to maintain the quality of the mortar, please use reasonable rotation speed. See mortar manufacturing specifications for additional information.

### **3.4 The laying process**

#### **3.4.1 Installing the tiles**

##### **3.4.1.1 Laying the floors:**

**STEP 1:** Spread a thin coat into the substrate by the straight edge of the trowel; use the Notched trowel to create a mortar layer with a thickness suitable for the thickness of the tiles (see manufacturer's instructions).



**STEP 2:** Spread a thin coat onto the back side of the tiles using a notched trowel. This step is even more important when applying tiles: Around a swimming pool, to a high traffic area, when laying large tiles, or in places where the installation job may be more difficult to carry out.

**STEP 3:** When laying tiles on the floor, use spacers to maintain even spacing between tiles. Spacing is dependent on the size of the tiles. Normally the gap is between 2mm and 9mm.

**STEP 4:** Press by hand (or tap with rubber mallet) to ensure there is no difference in height compared to surrounding tiles.

**STEP 5:** After 3-4 hours clean the surface, removing excess mortar and other dust. Remove the material in grout joints before grouting surface.

### **3.4.1.2 Wall Cladding**

**STEP 1:** Use the notched trowel to create a flat mortar layer on the wall. Do not work in areas greater than 20-25sf, as the mortar could set up before the tiles are applied to the wall.

**STEP:** Apply the adhesive to the back of the tile with notched trowel.

**STEP 3:** Lay the tiles onto the wall and tap the tile with a rubber mallet to ensure 100% adhesion between tile, wall and mortar. Use tile spacers to create a uniform spacing for grout.

**STEP 4:** After applying grout to the joints, clean all residual grout off the tile surfaces immediately.

### **3.4.2.1 Grouting Joints**

**STEP 1:** Select the suitable material for the application. See "1. Application materials"

**STEP 2:** The amount of material and liquid must be precisely measured, too ensure the proper ratio of material. Excess water could induce the appearance of a whitish film over the tile surface (efflorescence). Different color tones could result if mixtures with different water ratios are prepared. Efflorescence on the tile surface is the result of the formation of calcium carbonate and can also be caused by: Residual moisture contained in the substrates that we not allowed to dry adequately. Substrates not adequately protected from rising damp.

**STEP 3:** Before grouting, wait until the installation mortar, or adhesive, has completely cured. Verify that the wait time indicated on the relevant technical data sheets has been met.

**STEP 4:** The joints must be clean, free of dust and raked back to at least 2/3 of the tile thickness. Excess adhesive or mortar should be removed while still fresh.

**STEP 5:** Wed the joints with clean water before grouting, but not too much water.

**STEP 6:** Fill the joints completely with trowel (for large areas, you and use a rubber buffer wiper bar). Make sure the joints are completely compacted, and that there are no voids or unevenness.



**STEP 7:** Remove the grout excess grout from the surface while it is still fresh. Be sure to follow the manufacturer's recommendations. If the grout has not set up enough (when it is still plastic), this action may cause the grout to be dragged from the joint, and can cause color variations. Conversely, waiting too long can make it necessary to clean up the surface mechanically, which could possibly scratch the surface of the tiles.

**STEP 8:** All applications must be handled as outlined by the grout manufacturer.

#### **3.4.2.2 Expansion and Structural Joints**

**STEP 1:** The joints, whether expansion or structural, must be filled with an elastic material capable of absorbing the relative movements of the structure and/or covering. Elastomer profiles normally available on the market may be used for this purpose, choosing those of appropriate dimensions. Otherwise, the joint may be filled with silicone or polyurethane materials suitable for the environment in which they are employed.

**STEP 2:** In any case, the joints of the laying base must be observed. The covering must not be laid on top of these.

**STEP 3:** When laying small or large slabs, the structural or expansion joints must always be observed.

**STEP 4:** Bear in mind that structural or expansion joints must only be covered with specific products such as sealants, fillers, etc.

**STEP 5:** Under no circumstances must structural or expansion joints be covered with flooring or covering materials.

**STEP 6:** Materials appropriate for an indoor application, may not be appropriate for outdoor use. See Manufacturer specifications.

Below are acceptable materials for structural joints, from Mapei:

PRODUCT GROUP	PRODUCT NAME	NOTE
Silicon Base	Mapesil AC	
	Mapesil LM	
Polyurethane Base	Mapeflex PU20	2 Component, apply to floor
	Mpaeflex PU21	2 Component, apply to floor
	Mapeflex PU30	2 Component, apply to wall
	Mapefoam	

#### 3.4.2.3 Grout Calculation

$$\frac{(A + B)}{A * B} * C * D * P_s (Kg/m^2)$$

A=Tile Length (mm)

B= Tile Width (mm)

C= Tile Thickness (mm)

D= Joint width (mm)

Ps = Density of the grout material (g/cm<sup>3</sup>)

Density of some products:

Ultracolor – Ps=1.5

Keracolor FF– Ps=1.5

Keracolor GG – Ps=1.6

Marmocolor – Ps=1.5

Kerapoxy – Ps=1.6

#### 3.5 Cleaning

##### **Cleaning residual cement from the tiles:**

To clean tile floors or coverings with residual cement on the surface, we recommend the use of muriatic acid in a concentration of 5% diluted with water or buffered hydrochloric acid in a concentration of 3% diluted with water.

**Final Cleaning after installation:**

For the final cleaning the use of an alkaline product in a concentration of 2-5% is recommended. These are usually products recommended by the manufacturer of the adhesives; some industrial cleaning products can also be used.

**Cleaning Tools:**

Be sure to clean tools and containers with plenty of water before mortar hardens.

**4 Technical Data of Application Materials**

The technical data of the different adhesives or grout has be supplied by the manufacturer. Here are the technical specifications for some of Mapei's materials

4.1

Two component high performance fast-setting and hydration cementitious adhesive:  
**Granirapid.**

<b>Technical data</b>	
In Compliance with:	
<ul style="list-style-type: none"> <li>- European EN 12004 Class C2F</li> <li>- American ANSI A 118-1-1999</li> <li>- Canadian 71 GP 30 M Class 2</li> </ul>	
<b>Product Identity</b>	
<b>Part A</b>	
Consistency	White or grey powder
Bulk density (kg/dm <sup>3</sup> )	1.3
Dry solids content (%)	100
Storage	12 months in original unopened packaging, if stored in a dry place
Hazard classification according to EC 88/379	None Before using refer to the "Safety instructions for the preparation and application" paragraph and the information on the packaging as well as the Safety Data Sheet
<b>Part B</b>	
Consistency	Thick liquid
Color	Greenish white
Density (kg/dm <sup>3</sup> )	1.01
PH	10
Dry solids content (%)	21
Brookfield viscosity (mPa.s)	40
Storage	24 months in original unopened packaging. Protect from frost.
Hazard classification according to EC 88/379	None Before using refer to the "Safety instructions for the preparation and application" paragraph and the information on the packaging as well as the Safety Data Sheet

<b>Application Data</b>	
Mixing ratio	White: Part A: 22.5 kg + Part B: 5.5kg Grey: Part A: 25 kg + Part B: 5.5 kg
Consistency of Mix	Very pasty
Density of mix (kg/dm <sup>3</sup> )	1.6
pH of mix	Approx. 11
Pot life of mix	45 min
Open time	Approx. 20 min
Setting time	Approx. 2 hours
Grouting	After 3 hours
Set to light traffic	After 3-4 hours
Ready for use	After 24 hours (3 days for basins and swimming pools)
<b>Final Performances</b>	
Tensile adhesion strength (according to EN 1348) -N/mm <sup>2</sup>	
-initial (after 28 days)	2.5
-after heating	2.2
-after water immersion	1.3
-after freeze/thaw cycle	1.4
Flexural Strength-N/mm <sup>2</sup>	
-initial (after 24 hours)	3.0
-after 7 days	5.0
-after 28 days	6.0
Flexural Strength-N/mm <sup>2</sup>	
-initial (after 24 hours)	10.0
-after 7 days	17.0
-after 28 days	20.0
Resistance to acids	Fair
Resistance to alkalis	Excellent
Resistance to oils	Excellent
Resistance to solvents	Excellent
Temperature when in use	From -30°C to 90°C (-22°F to 194°F)

4.2

Two component acid-resistant epoxy grout for joints of at least 3mm -**Kerapoxy**

<b>Technical Specification of Material</b>		
In Compliance with:		
<ul style="list-style-type: none"> <li>- European EN 12004 as R2T</li> <li>- European EN 12004 as RG</li> <li>- DIN 18156-E</li> <li>- BS 5980-1980 class AA</li> <li>- American ANSI A 118.3-1992</li> <li>- Canadian 71 GP 30 M Class 1</li> </ul>		
<b>Product Identity</b>		
	<b>Part A</b>	<b>Part B</b>
Type	Thick Paste	Dense liquid
Color	26 colors Available	26 colors Available
Density apparent (g/cm <sup>3</sup> )	1.64	0.97
Dry solid content (%)	100	100
Brookfield viscosity (mPa.s)	3500000	900
Storage	24 months in a dry place in original packaging. Store Part A at a temperature of at least 10°C to avoid crystallization. (it can be reversed by warming)	
Hazard Classification according to 99/45/EC	IRRITANT – Before using, consult the Safety Instructions paragraph and the information on packaging, and the Safety Data Sheet.	
<b>Composition and Properties of the mixture</b>		
Mix Ratio	Part A : Part B =9:1	
Consistency of mix	Very pasty	
Density of mix (g/cm <sup>3</sup> )	1.55	
Pot Life	45 minutes	
Application temperature	12°C – 30°C (54°F – 86°F)	
Open Time (as an adhesive)	30 minutes	
Adjustability time (as an adhesive)	60 minutes	
Set to light foot traffic	After 24 hours	
Ready for use	After 4 days	

Final Performances	
Shear adhesion strength (EN 12003) – N/mm <sup>2</sup>	
-initial	25
-after water immersion	23
-after thermal shock	25
Flexural strength (EN12808-3)-N/mm <sup>2</sup>	41
Compressive strength (EN12808-3) – N/mm <sup>2</sup>	58
Resistance to abrasion (EN12808-3)	147 (loss in mm <sup>3</sup> )
Shrinkage (EN 12808-4)	0.80 mm/m
Water absorption (EN 12808-5)	0.05g
Resistance to moisture	Excellent
Resistance to ageing	Excellent
Resistance to solvents and oils	Excellent
Resistance to acids and alkalis	Excellent
Temperature in use	From -20°C to 100°C (4°F to 212°F)

## 5. Maintenance

### 5.1 Surface protection maintenance

Application of a sealer after laying tiles or cladding will help to protect the surface and will aid in the ease of clean up.

There are many different materials that can be applied. Here are some suggestions:

COMPANY	Product	NOTE
AKEMI	Stain Repellent Super Stain Repellent W	Solvent Based Water Based
TASMAN CHEMICALS	Heritage Finish	Solvent Based
FEDERCHEMICALS	Keos/98 Idrobase 303	Solvent Based Water Based.

Always follow the manufacturer's instructions when using any sealing products.

Application can be made after Tiles are installed. Depending on the sealer used and the amount of traffic on the surface, a 2<sup>nd</sup> coat of sealer may need to be applied.

Over time and use, the sealer will need to be applied again to maintain protection for the floor. How often this will be needed is dependent upon the sealer used, and the traffic the floor receives.

## **5.2 Daily cleaning and maintenance**

The surface needs to be cleaned daily; this can be done with soap and water. This daily cleaning will help the material keep it's like new appearance for years to come.

For dried on material a plastic putty knife can be used to scrape off the surface

If warm soapy water will not clean up an area, other cleaning materials can be used. There are many different cleaning agents on the market, we recommend using pH neutral cleaners for the longest life of your surface. Some examples of suitable cleaners are: Stone Cleaner, Algae and Mildew Remover (For organic based stains), from Akemi. Remember when using cleaners to follow the manufacturer's instructions.

Try to avoid using harsh cleaners when possible. These cleaners can damage the structure of the surface resulting in a dulling of the polish, as well as making the surface less able to repel other potential stains.