# Tile Installer's Manual

## **PRODUCTS** FOR **CERAMIC TILES**







### From our experience, all the solutions you need...

This document has been issued by the MAPEI Technical Services Department to present the most common bonding systems for ceramic and stone material, and contains a step-by-step guide that illustrates the main application techniques of the various products employed in bonding systems (adhesives, grouts, sealants, etc.).

The various situations covered by this manual and the recommendations for each situation is for indication purposes only and do not cover all the problems and conditions encountered on site. In the event of encountering such situations, the MAPEI Technical Services team is always on hand to help identify the most appropriate solution for each specific intervention.

For more in-depth information about our products, make sure you always consult the relative product Technical Data Sheets available at our website www.mapei.it.

MORE THAN 75 YEARS IN THE BUSINESS WITH THE AIM OF SUPPLYING SOLUTIONS OF EXCELLENCE. **MAPEI'S LEADERSHIP** IS BASED ON KNOW-HOW THAT IS SECOND TO NONE.

Over the course of more than 75 years in the business, MAPEI has played an important role on both **small and large building** sites and in **restoration and conservation** projects on buildings which are a part of the cultural and artistic heritage of Italy and the world.

The story of MAPEI obviously has a close tie with that of the country which witnessed its foundation, and it is also the story of a Company that operates with enormous success **all around the world**, ready to meet the challenges of the new millennium.

All this following a well-defined corporate philosophy: **specialisation** in the building world, **internationalisation**, research and development into increasingly technologically-advanced products, tailor-made service and support for our clientele, teamwork, concern for the health and safety of all those who use our products and the care taken by our Human Resources department.

### **CERTIFIED QUALITY AND COMMITMENT TO THE ENVIRONMENT** ... beyond apparent sustainability

#### .AND DEVELOPING TECHNOLOGICALLY-ADVANCED PRODUCTS AND SOLUTIONS WHICH CONTRIBUTE TO SAFEGUARDING THE ENVIRONMENT AND OUR HEALTH ...



#### BioBlock

Mapei technology that impedes the formation and proliferation of various types of mould in damp conditions.



#### DropEffect

Low Dust

Mapei technology based on the use of special hydrophobising admixtures, which allows surfaces to be created that are characterised by high water repellence, their tendency to attract less dirt and excellent durability.



#### **Green Innovation**

Our commitment to the environment

MAPEI products help designers and contractors design and create innovative LEED-certified projects "The Leadership in Energy and Environmental Design" in compliance with the U.S. Green Building Council.



Certified carbon footprint (ISO TS 14067).

No residual greenhouse gas emissions through certified offsetting.



#### Ultralite

Lightweight adhesives characterised by their low density and higher yield compared with traditional adhesives.

Mapei's Low Dust technology allows dust emissions during the mixing, working

and application phases of powdered products to be reduced by 90%, with

MAPEI BONDING PRODUCTS AND SYSTEMS COMPLY WITH THE REQUIREMENTS OF THE EUROPEAN CONSTRUCTION PRODUCTS **REGULATIONS (CPR 305/2011, formerly CPD)** 



FN 13888

Adhesives for ceramic tiles and stone material, renders, screed materials, masonry mortars, products for restoring and protecting concrete, admixtures for concrete, fastening systems, thermal cladding systems, etc. all comply with European Standards and carry the CE mark, as required by the CPR.

Special logos are used in our catalogues and on Technical Data Sheets to indicate that a product meets the requirements and the relative reference standard.



Other logos indicate the characteristics of the product according to the designation of the relative European Standards.

Since 2005 these products, tested and certified by GEV internationally-gualified institutes, have earned the right to carry the "EC1" (very low emission of volatile organic compounds) mark and, since 2010, the "EMICODE EC1 PLUS" (very low emission level of volatile organic compounds-PLUS) mark. Both marks are awarded by the GEV Institute (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an association which checks emission levels of products used for floors, adhesives and various materials used in the building industry, and of which MAPEI is a member.

#### MAPEI APPLIES QUALITY, ENVIRONMENTAL AND HEALTH & SAFETY MANAGEMENT SYSTEMS CERTIFIED ACCORDING TO INTERNATIONAL STANDARDS ISO 9001, ISO 14001 AND OHSAS 18001



Since 1994. Mapei SpA has applied a Quality System certified by Certiquality, in compliance with ISO 9001 standards. The number of MAPEI group companies and facilities which boast this certification is increasing each year.



Mapei SpA's Italian-based facilities apply an Environmental Management System, certified by Certiquality in compliance with ISO 14001 standards.

As with the quality system, this certification is being applied in an increasing number of the group's companies and facilities.

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## Mapei, a world of adhesives



From Mapei, a wide range of high quality products for bonding ceramic tiles, stone material and mosaic, suitable for any condition at any latitude.

- Technologically advanced systems
- Easy to use
- For floor and wall coverings
- For internal and external use
- Eco-sustainable
- Certified according to the most severe international standards



## SUMMARY

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### STANDARD FOR THE INSTALLATION OF CERAMIC FLOOR AND WALL COVERINGS

In June 2013, a technical standard was finally issued in Italy to regulate the **installation of ceramic tiles**: *UNI 11493:2013 – Ceramic floor and wall tiling – Design, installation and maintenance instructions*. This standard applies to all internal and external ceramic floor and wall tiling bonded mainly with adhesive, but also with cementitious mortar.

#### DEFINITION OF THE MAIN ACTORS AND TRACEABILITY

A traceability document is included in the standard, consisting of a technical report compiled by the Works Director (or the installer) that is handed over to the client upon consignment of the completed work. This document identifies all those persons that have contributed to the execution of the tiling work as follows:

#### CLIENT

The client defines the technical and aesthetic specifications and performance requirements of the tiling, and also chooses which tiles are to be used. The client may be the builder, the Works Director, the tile installer or the owner of the property.

#### TILING DESIGNER

The designer's task is to identify the most appropriate installation solution and dimensions of the tiling.

#### WORKS DIRECTOR

The Works Director checks the design, ensures work is executed in compliance with design specifications, coordinates all the quality aspects of the materials and analyses and acts upon any feedback received from the installer.

#### TILE INSTALLER (tiling company)

The tile installer is responsible for the correct execution of the work in compliance with design specifications and the decisions and instructions from the Works Director, checking the quality of the materials employed (tiles, adhesive, etc.) and the condition of the substrate and making sure materials are stored correctly. The tiler must also take care of the work area and make sure it is protected both during and after installation until it is consigned to the client.

#### MANUFACTURER OF THE MATERIALS

The manufacturer is responsible for checking that the materials they produce comply with current standards.

#### **RETAILER OF THE MATERIALS**

The retailer is responsible for the correct storage of the materials and products until they are delivered, and for communicating any warranties, technical documentation and safety data sheets issued by the manufacturer.

#### MAIN CONCEPTS COVERED BY THE STANDARD

#### Choosing the adhesive

The main factors (schematically represented by appendix D in the standard) to consider when choosing the correct adhesive are as follows:

- type and format of the material;
- · type and characteristics of the substrate;
- final use;
- work execution restraints and requirements;
- work execution requirements.

#### Minimum requirements of substrates

Whatever the type of substrate, prior to installation it must be well cured, clean, dry and flat and be free of all materials and substances that could potentially affect adhesion of the adhesive or skim coat.

The cohesive tensile (pull-off) and adhesion strength of **render** to the underlying load-bearing layer must be at least 10 kg/cm<sup>2</sup> (1 N/mm<sup>2</sup>).

Screeds must have the following mechanical properties: – residential use:  $Rc \ge 15-20 \text{ N/mm}^2$ ;

- industrial use:  $Rc \ge 30-40 \text{ N/mm}^2$ .

#### **Double-buttering**

The adhesive must be applied using the double-buttering technique (the adhesive is applied on the back of the tiles as well as on the substrate) in those cases where full contact of the adhesive with the installation bed must be guaranteed.



#### Joint specifications

The definition and prescriptions of the joints (structural, distribution, expansion and perimeter joints) and the pitch of the joints.



#### Mechanical fasteners

If the longest side of the tile is more than 30 cm, the designer must evaluate the use of an additional mechanical fastening system for extra security (such as steel hooks fastened to the substrate).



#### Minimum width of joint

In the design prescriptions, the width of the joints may be  $\geq$  3 mm for rectified tiles in internal environments bonded on rigid, dimensionally-stable substrates, or up to 6-8 mm for the opposite conditions.

Butt joints, therefore, are no longer allowed.



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### **STANDARDS FOR THE INSTALLATION OF STONE MATERIAL**

The Italian standards that currently provide the guidelines to be followed when choosing materials and for the design, installation and maintenance of stone floor and wall coverings are the following:

UNI 11322-2009 STONE FLOOR COVERINGS UNI 11521-2014 STONE COVERINGS for VERTICAL SURFACES and CEILINGS

There is an enormous variability in the type, behaviour and performance characteristics of stone materials. For this reason, the evaluation of the various materials has been standardized by taking into consideration previous experience and by carrying out preliminary tests, mainly to verify some of the typical characteristics of stone material.

The problems normally encountered when installing stone material (to be analysed independently) may be summarised as follows.

#### DIMENSIONAL STABILITY AND WARPING

#### Problem

Certain types of stone material (especially some types of green marble, slate and recomposed polyester) can warp due to the effect of moisture from the **adhesive** or **installation mortar**. A material's tendency to warp is also highly dependent on the shape, size and thickness of the slab.



#### Solution

The definition and prescriptions of the joints (structural, distribution, expansion and perimeter joints) and the pitch of the joints

Class A: materials not prone to warping.

Class B: materials prone to warping.

Class C: material highly prone to warping.

DEFORMATION CLASS												
CLASS A	CLASS B	CLASS C										
NORMAL- SETTING CEMENTITIOUS ADHESIVE	RAPID-SETTING CEMENTITIOUS ADHESIVE	RESIN-BASED REACTIVE ADHESIVE										
Keraflex Keraflex Maxi S1 Kerabond + Isolastic Ultralite S1 Ultralite S2	Granirapid Elastorapid Keraquick S1	Ultrabond Eco PU 2K Keralastic Kerapoxy										

#### STAINING AROUND ELASTIC JOINTS

#### Problem

The use of certain types of **sealants** in elastic joints may cause staining of the stone around the joints.



#### Solution

Use a neutral-hardening silicone sealant such as *Mapesil LM* to prevent staining.



#### STAINING and EFFLORESCENCE on the SURFACE OF STONE

#### Problem

Certain types of stone material (particularly marble, granite and light colours recomposed stone) may be stained by the presence of water during installation:

- on a bed of mortar or with a normal-setting adhesive;
   on substrates that are not sufficiently protected against
- water rising up from the ground by capillary lift (due to the lack of a vapour barrier);
- on screeds that have not been thoroughly cured with a high level of residual moisture.



#### Solution

- Lay a vapour barrier comprising polythene sheets under the cementitious screed to block the capillary lift of water.
- The render or screed must be dry and thoroughly cured. Installing a rapid-drying screed made from Topcem, Topcem Pronto, Mapecem or Mapecem Pronto reduces the waiting time before installing stone.
- Install stone material using class F rapid-setting adhesive (according to EN 12004).



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### **PRODUCTS FOR MAKING AND PREPARING SUBSTRATES**

#### HYDRAULIC BINDERS for cementitious screeds

#### ADVANTAGES:

- Considerably reduce curing and drying times of screeds compared with traditional sand/cement screeds, which require 7-10 days curing per cm of thickness;
- create distribution joints with a larger pitch, thus reducing the number of expansion joints required in the screed.



#### Торсет

- Special quick-drying, shrinkagecompensated hydraulic binder for normal-setting screeds.
- Waiting time before installation:
  - 24 hours for ceramic;
     2 days for natural stone:
  - 2 days for resilients and wood.



#### Mapecem

- Special rapid-setting and drying, shrinkage-compensated hydraulic binder for screeds.
- Waiting time before installation:
   3 hours for ceramic and natural stone:
  - 24 hours for resilients and wood.

#### **READY-MIXED MORTARS for cementitious screeds**

#### ADVANTAGES:

- Solve the problem of acquisition, storage and quality of raw materials (aggregates, binders, etc.), especially when carrying out rebuilding and renovation work in historic town centres;
- the final mechanical characteristics of the screed are known prior to installation;
- guarantee lower drying and curing times whatever type of aggregate is used;
- prevent dosage and mixing errors often caused by the inexperience of the workforce.



#### **Topcem Pronto**

- Ready-mixed, normal-setting, shrinkage-compensated mortar for quick-drying screeds.
- Waiting time before installation:
   24 hours for ceramic;
  - 2 days for natural stone;
  - 4 days for resilients and wood.



#### **Mapecem Pronto**

- Ready-mixed, rapid-drying and hydrating, shrinkage-compensated mortar for screeds.
- Waiting time before installation:
   3 hours for ceramic and natural stone:
  - 24 hours for resilients and wood.

#### SELF-LEVELLING PRODUCTS for internal use



#### Ultraplan

Self-levelling, ultra rapid-hardening smoothing compound applied in layers 1 to 10 mm thick.





#### Novoplan Maxi

Rapid-hardening, fibre-reinforced, free-flowing cementitious levelling mortar with high thermal efficiency applied in layers 3 to 40 mm thick, specifically designed for underfloor heating/cooling systems.

#### THIXOTROPIC CEMENTITIOUS SMOOTHING COMPOUNDS



#### Planitop Fast 330



- Waiting time before installation: - 4 hours for ceramic:
  - 24 hours for waterproofing layers.

#### Nivorapid



cementitious smoothing compound for internal use applied in lavers 1 to 20 mm thick, also suitable for vertical surfaces.



CECEFER

#### Adesilex P4

Rapid-hardening cementitious smoothing compound applied in layers 3 to 20 mm thick to even out internal and external floors.



- Ultra rapid-drying, thixotropic,



Smoothing mortar for internal and external walls and ceilings applied in layers 2 to 30 mm thick.



#### Latex Plus

Latex elasticising admixture mixed with NIVORAPID for levelling off internal substrates in sheet steel. wood, rubber, PVC, etc.



#### Planicrete

Synthetic latex rubber to improve adhesion and strength of cementitious mortar.

## **PRIMERS and BONDING PROMOTERS**



#### Eco Prim T

Solvent-free acrylic primer with very low emission of volatile organic compounds (VOC) for absorbent and non-absorbent substrates.



#### Primer G

Synthetic resin primer in water dispersion with very low content of volatile organic compounds (VOC).



#### Eco Prim Grip

Ready-to-use, synthetic acrylic resin-based bonding promoter and primer with silica aggregates with very low emission of volatile organic compounds (VOC) for render applied on non-absorbent substrates, skim coats and adhesives for ceramic tiles.



#### Primer MF

Two-component, solvent-free epoxy primer used as adhesion promoter for products from the MAPEFLOOR line, for consolidating and waterproofing cementitious surfaces against residual moisture and as an anti-dust impregnator on concrete floors.



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## WATERPROOFING PRODUCTS

More than for any other sector, rather than discussing just a single waterproofing product, we must consider the concept of a WATERPROOFING SYSTEM, comprising a package of products that also have the capacity to protect well known critical areas (such as joints, drainage points, changes in slope, corners and edges).

Bathrooms, swimming pools, wellness centres, balconies and terraces: environments where the interface between the substrate and tiling needs to be waterproofed, with the added advantage of preventing: – progressive weakening of the substrate;

- the formation of unsightly efflorescence along the joints;
- the risk of tiling becoming detached.

This is why MAPEI has always offered a range of different solutions according to specific application requirements.

	WATERPROOFING PRODUCTS													
题 🔝 🐷	Mapelastic		Mapelastic Smart											
	Two-component elastic cementitious mortar for waterproofing balconies, terraces, bathrooms and swimming pools.		Two-component, high-elasticity cementitious mortar (with crack- bridging capacity > 2 mm) applied by trowel or roller for waterproofing balconies, terraces, bathrooms and swimming pools.											
	Monolastic 🚧	💽 🗃 🔝 逦 🛲	Mapelastic Turbo											
21	One-component cementitious waterproofing mortar.		Two-component, rapid-drying elastic cementitious mortar for waterproofing terraces and balconies, including at low temperatures and on substrates not completely dry.											
CC 📷 🛲	Mapelastic AquaDefense		Mapegum WPS											
	Ready-to-use, ultra rapid-drying, elastic liquid membrane for waterproofing internal and external surfaces.		Rapid-drying elastic liquid membrane for waterproofing internal surfaces.											
	STRENGTHENING	REINFORCEMENT												
CC 💽	Mapetex Sel		Mapenet 150											



Macro-perforated, non-woven polypropylene fabric for reinforcing waterproofing membranes.



Alkali-resistant glass fibre mesh (in compliance with ETAG 004 guidelines) for reinforcing protective waterproofing layers, anti-fracture membranes and cladding systems.

#### ACCESSORY COMPONENTS FOR THE SYSTEM

#### **Drain Front**



TPE angular pipe union for terraces and balconies.



> TPE tape for flexible sealing and waterproofing of expansion joints and cracks subject to movement.

Mapeband TPE



Alkali-resistant rubber tape with felt for cementitious waterproofing systems and liquid sheaths.

Mapeband



#### Drain Vertical/ Drain Lateral

 Kit for installing floor drains, ideal for draining off water from terraces, balconies, bathrooms, boiler rooms, wash-rooms, etc.





- PVC tape for waterproofing systems made from liquid membrane.
- Self-adhesive butyl tape with alkaliresistant, non-woven fabric for elastic waterproofing systems.





To see how to use these products VISIT OUR WEBSITE at: www.mapei.it

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## **ADHESIVES FOR CERAMIC AND STONE MATERIAL**

The performance characteristics of adhesives are identifiable by their classification code according to EN 12004 standards, as illustrated in the following table:

ТҮРЕ		ADHESION CLASS	OPTIC	
Cementitious adhesives	C	Normal adhesion	1	Extend
Dispersion adhesives	D	Improved adhesion	2	Rapid a
Reactive adhesives	R			Slip-re:
				Deform cement
				Highly

OPTIONAL CHARACTERISTICS									
Extended open time	Е								
Rapid application	F								
Slip-resistant	т								
Deformable cementititous adhesive	S1								
Highly deformable cementititous adhesive	S2								

# Mapei bags have a lot to say for themselves

The packaging for Mapei products plays a very important role, with phrases and "talking" icons that provide all the most important information about the product it contains.



	12004	Colours Waiting tin available grou		ime before uting		lic		efore rvice		
	Certification according to EN	White	Grey	Walls	Floors	Pot life of mix	Set to foot traf	Open time	Waiting time b putting into se	Packaging
NORMAL-SETTING CEME	INTITIOU	IS A	DH	ESIVES						
Adesilex P9	C2 TE	•	•	4-8 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	5 and 25 kg
Adesilex P10	C2 TE	•		4-8 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	5 and 25 kg
Adesilex P10 + Isolastic 50%	C2 TE S1	•		4-8 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	5 and 25 kg
Kerabond	C1	•	•	4-8 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	5 and 25 kg
Kerabond + Isolastic	C2 E S2	•	•	4-8 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	5 and 25 kg
Keraflex	C2 TE	•	•	4-6 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	5 and 25 kg
Keraflex Easy	C2 E	•	•	4-6 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	25 kg
Keraflex Maxi S1	C2 TE S1	•	•	4-8 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	25 kg
Keraflex Maxi S1 Zero	C2 TE S1		•	4-8 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	25 kg
Keraset	C1	•	•	6-8 hours	24 hours	8 hours	24 hours	> 20 mins.	14 days	25 kg
Tixobond White	C1 TE	•		4-8 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	25 kg
Ultralite S1	C2 TE S1	•	•	4-8 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	15 kg
Ultralite S2	C2 E S2	•	•	4-8 hours	24 hours	8 hours	24 hours	> 30 mins.	14 days	15 kg
Ultralite Flex	C2 TE	•	•	4-8 hours	24 hours	more than 8 hours	24 hours	> 30 mins.	14 days	15 kg
RAPID-SETTING CEMENT	FITIOUS .	ADł	IES	IVES						
Adesilex P4	C2 F		•	4 hours	4 hours	1 hour	4 hours	20 mins.	1 day	25 kg
Elastorapid	C2 FTE S2	•	•	3 hours	3 hours	1 hour	2-3 hours	30 mins.	1 day	31.25 kg
Granirapid	C2 F S1	•	•	3 hours	3 hours	45 mins.	3-4 hours	20 mins.	1 day	30.5 kg
Keraquick S1	C2 FT S1	•	•	2-3 hours	2-3 hours	30 mins.	2-3 hours	20 mins.	1 day	25 kg
Keraquick S1 Zero	C2 FT S1		•	2-3 hours	2-3 hours	30 mins.	2-3 hours	20 mins.	1 day	25 kg
Keraquick S1 + Latex Plus	C2 FT S2	•	•	2-3 hours	2-3 hours	30 mins.	2-3 hours	20 mins.	1 day	25 kg
Keraquick S1 Zero + Latex Plus	C2 FT S2		•	2-3 hours	2-3 hours	30 mins.	2-3 hours	20 mins.	1 day	25 kg
Ultralite S1 Quick	C2 FT S1	•	•	2-3 hours	2-3 hours	50 mins.	2-3 hours	20 mins.	1 day	15 kg
Ultralite S2 Quick	C2 FE S2	•	•	2-3 hours	2-3 hours	50 mins.	2-3 hours	30 mins.	1 day	15 kg
SYNTHETIC RESIN-BASE	D ADHE	SIVE	ES							
Adesilex P22	D1 TE	•		24 hours	24 hours	ready to use	48 hours	> 30 mins.	7-14 days	1, 5, 12, 25 kg
Ultramastic III	D2 TE	•		24 hours	24 hours	ready to use	48 hours	> 30 mins.	7 days	1, 5, 12, 25 kg
REACTIVE ADHESIVES										
Keralastic	R2	•	•	12 hours	12 hours	30-40 mins.	12 hours	50 mins.	7 days	5, 10 kg
Keralastic T	R2 T	•	•	12 hours	12 hours	30-40 mins.	12 hours	50 mins.	7 days	5, 10 kg
Ultrabond Eco PU 2K	R2 T	•	•	12 hours	12 hours	20-30 mins.	12 hours	20 mins.	7 days	5, 10 kg
Kerapoxy Adhesive	R2	•	•	-	-	45 mins.	12 hours	60 mins.	2 days	10 kg
Kerapoxy Design	R2	-	-	-	-	45 mins.	24 hours	30 mins.	4 days	3 kg
Kerapoxy	R2 T	-	-	-	-	45 mins.	24 hours	30 mins.	4 days	2, 5, 10 kg

# HOW TO PREPARE AND APPLY ADHESIVE



#### Preparation of the mix

- · Mix the powdered adhesive with the required amount of water or latex and for long enough to form a smooth, lump-free mix.
- Leave the adhesive mix to stand for at least 5 minutes and then mix again briefly before spreading.
- Only mix the amount of adhesive that can be used within its workability time.
- Never add water and/or re-mix the adhesive once it has started to set.

#### Choosing the right trowel and applying the adhesive



- Apply the adhesive with a suitable notched trowel so that the right amount of adhesive is applied and to guarantee the back of the tile is wetted correctly. The amount of adhesive required varies according to the area of final use, the roughness of the substrate and the format of the tiles.
- If the open time of the adhesive is exceeded (already applied to the substrate), but is still soft when pressed lightly with a finger, it may still be used by going over the surface with a notched trowel. This operation must not be carried out once the adhesive has started to set

#### Wetting properties of the adhesive

Use adhesive with high wetting properties such as Ultralite or Keraflex Easy, or self-wetting adhesive such as Adesilex P4 for good wetting of the back of the tiles (bonding large formats, slim tiles, bonding on external surfaces. etc.).



#### **Double-buttering**

Apply the adhesive on the substrate and on the back of the tiles, making sure there is a seamless layer of adhesive when bonding on façades, for large formats (longest side more than 60 cm), on heated surfaces or in environments subjected to high mechanical or thermalhygrometric stresses.



## CHARACTERISTICS OF ADHESIVES ACCORDING TO UNI 12004 STANDARDS

An important addition to UNI 11493 is contained in appendix D, a schematic summary of the minimum requirements of adhesives (in compliance with EN 12004) according to the following factors:

\_\_\_\_\_\_

- 1. Type and format of the material
- 2. Type and characteristics of the substrate
- 3. Final use
- 4. Work execution restraints and requirements
- 5. Exposure of the surface

The main differences between the various adhesives are the following parameters:

#### Extended open time

Use **adhesives with extended open time** (class E according to EN 12004) when bonding in unfavourable climatic conditions (wind, high temperatures, low humidity, absorbent substrates, etc.).



#### Deformability of the adhesive

Use **deformable adhesive** (class S1 or S2 according to EN 12004) with the capacity of absorbing the stresses generated between the tiles and bonding surface without damaging the tiles who required (bonding on substrates subjected to vibrations or flexion, bonding on external surfaces, etc.).



#### Vertical slip

Use **adhesives with low vertical slip** (class T according to EN 12004) when bonding on walls.



#### **Rapid bonding**

Use **rapid-setting adhesive** (class F according to EN 12004) when the time required before putting the tilling into service needs to be reduced.





## **GROUTING THE TILES**

The performance characteristics of grouts are identifiable by their classification code according to EN 13888 standards, as illustrated in the following table:

Reactive grouts	RG	-	Mixture of synthetic resins, aggregates and organic and inorganic admixtures where hardening takes place through a chemical reaction
		Class 1	Cementitious mortar for normal joints
Cementitious grouts	CG	Class 2	Cementitious mortar for $improved$ joints with high resistance to abrasion (A) and reduced water absorption (W)

### Mapei packaging has a lot to say for itself



### Mapei technology



**DropEffect**<sup>®</sup> technology, developed by MAPEI, is based on the use of special polymers that allow surfaces to be created which attract less dirt characterised by their high water repellence and excellent durability.



**BioBlock**<sup>®</sup> technology, developed by MAPEI, consists in special organic molecules which, by distributing themselves homogeneously in the micro-structure of the joints, block the formation of the micro-organisms which cause mould to grow in the presence of damp.

	EN 13888	DropEffect <sup>®</sup>	<b>BioBlock<sup>®</sup></b>	Width of joint permitted	Application temperature	Pot-life of mix	Waiting time before finishing	Set to foot traffic	Ready for service	Packaging
CEMENTITIOUS GROUTS										
Ultracolor Plus	CG2WA	•	•	2 to 20 mm	+5 to +35°C	20-25 mins.	15-30 mins.	3 hours	24 hours	1, 5 and 23 kg
Keracolor SF*	CG2WA			up to 4 mm	+5 to +35°C	24 hours	approx. 2 hours	10-20 mins.	7 days	5 and 22 kg
Keracolor FF*	CG2WA	•		up to 6 mm	+5 to +35°C	24 hours	approx. 2 hours	10-20 mins.	7 days	5 and 25 kg
Keracolor GG*	CG2WA			3 to 15 mm	+5 to +35°C	24 hours	approx. 2 hours	10-20 mins.	7 days	5 and 25 kg
Keracolor PPN	CG2WA			-	+5 to +25°C	20 mins.	-	6 hours	3-7 days	25 kg
EPOXY GROUTS	\$									
Kerapoxy	RG	-	-	min. 3 mm	+12 to +30°C	45 mins.	-	24 hours	4 days	2, 5 and 10 kg
Kerapoxy CQ	RG	-	•	min. 2 mm	+12 to +30°C	45 mins.	-	12 hours	3 days	3 and 10 kg
Kerapoxy Design	RG	-	-	2 to 7 mm	+12 to +30°C	45 mins.	-	24 hours	4 days	3 kg
Kerapoxy P	RG	-	-	min. 3 mm	+12 to +30°C	45 mins.	-	24 hours	4 days	10 kg
Kerapoxy IEG	RG	-	-	min. 3 mm	+12 to +30°C	45 mins.	-	24 hours	4 days	10 kg
READY-TO-USE	GROUTI	NG F	PAST	ES						
Fix & Grout Brick	-		•	-	+5 to +30°C	ready to use	-	-	-	5 and 12 kg
Flexcolor	-	•	•	2 to 10 mm	+5 to +35°C		10-15 mins.	48 hours	7 days	5 kg

\* Product mixed with water or FUGOLASTIC

And to give existing cementitious joints a new lease of life...

## **Fuga Fresca**

Acrylic resin-based paint in water dispersion to bring back the colour of tile joints in ceramic tiles.



reference guide to calculate consumption rates

www.mapei.it

JOINTS





## HOW TO GROUT JOINTS

Before grouting joints, whatever type of mortar is used, wait until the adhesive has completely hardened and that the waiting times indicated in the relative Technical Data Sheet have been respected. The joints must be clean, free of all traces of dust and empty for at least two thirds of their thickness.

#### **CEMENTITIOUS** grouts



Pour the powdered grout into a clean container of water or latex while mixing according to the quantities indicated on the Technical Data Sheet. Use a mixer at low-speed to form a smooth paste. Leave it to stand for 2-3 minutes and quickly mix again before use.



Apply the grout in the joints in the wall and/or floor tiles using the appropriate MAPEI trowel or rubber spreader without leaving any gaps or uneven areas. Remove the excess grout from the surface of the tiles by passing the trowel or spreader diagonally to the joints while the grout is still wet.



When the grout loses its elasticity and becomes opaque, wash off any excess grout with a damp cellulose sponge (such as a MAPEI sponge) working diagonally to the joints. Rinse the sponge frequently using two separate containers of water: one to rinse the excess grout from the sponge and a second container with clean water to rinse the sponge.



Finish off the joints when the grout is partially hardened using an abrasive grout pad (such as a damp *Scotch-Brite®* pad along the joints to even out the surface). A single-head sander with a special felt disk may also be used for this operation. If the joints are cleaned too soon (while the grout is still plastic) the grout may be pulled from the joints and leave gaps, which could then change colour more easily.



If the surface of the tiles is still dirty with traces of grout because it has not been applied correctly, an acid-based cleaner may be used (such as *Keranet*) at least 24 hours after grouting the joints. Only use *Keranet* on acid-resistant surfaces and never on marble or limestone.

#### **EPOXY** grouts



Pour all the catalyser (component B) into the container of component A and blend together with a mixer at low-speed to form a smooth paste. Never use partial quantities of the components otherwise the grout may not harden correctly. When using *Kerapoxy Design*, various amounts of *MapeGlitter* may be added according to the effect required.



Apply the mix carefully in the joints (which must be dry prior to application) using a special MAPEI trowel, making sure the joints are completely filled to the bottom. Remove excess material by passing the edge of the same trowel diagonally over the tile joints.



Epoxy grout must be cleaned while still "wet". Wet the grouted surface and emulsify using a *Scotch-Brite*<sup>®</sup> pad, taking care not to remove grout from inside the joint. Clean the tiling with the same type of pad, but saturated with more water.



Remove any excess liquid from the surface with a hard, cellulose sponge (such as a MAPEI sponge). Replace the sponge when it is too impregnated with resin. It is important that there are no traces of grout on the surface of the tiling after the cleaning operation. Once hardened it is very difficult to remove, whichh is why the sponge must be rinsed frequently.



The final cleaning operation may be carried out using *Kerapoxy Cleaner*, a special cleaning agent for epoxy grout. This product may also be used to remove light traces of grout several hours after application. In such cases, the product may be left to react for longer (at least 15-20 minutes). The efficiency of *Kerapoxy Cleaner* depends on the amount of resin residues and how much time has passed since application. Cleaning must always be carried out while the product is still "wet" as described above.

🛞 MAPE

## **SEALANTS FOR ELASTIC JOINTS**

MAPEI offers a complete range of silicone sealants in compliance with the requirements of the reference standard for products used to form elastic seals in joints: **EN ISO 11600** "*Jointing products - Classification and requirements for sealants*".



reference guide to calculate consumption rates
www.mapei.it

**ELASTIC SEALANTS** 



				Typ applic	e of ation	rice		
	Description and main areas of use	<b>BioBlock®</b>	Paintable	Hi-flow	Thixotropic	Elongation in serv	Packaging	
Mapesil AC	Pure acetic silicone sealant, ideal for floor joints and ceramic tiling in damp environments and swimming pools	•			•	25%	310 ml	
Mapesil LM	Neutral silicone sealant, ideal for joints in natural stone tiling and façades	•			•	25%	310 ml	
Mapesil Z Plus	Pure acetic silicone sealant, ideal for fillet joints between bathroom fittings, shower booths and sinks				•	20%	280 ml	
Mapeflex PU20	Two-component epoxy-polyurethane sealant ideal for industrial floors, car-parks, garages, courtyards and commercial areas			•		10%	5 and 10 kg	
Mapeflex PU21	Two-component epoxy-polyurethane sealant ideal for internal joints in covered car parks, supermarkets, warehouses and storage areas			•		5%	5 and 10 kg	
Mapeflex PU30	Two-component epoxy-polyurethane sealant ideal for vertical and horizontal joints in car-parks, garages, courtyards, commercial areas and warehouses				•	10%	5 and 10 kg	
Mapeflex PU40	One-component polyurethane sealant ideal for expansion and fillet joints on pre-fabricated buildings and traditional and ventilated façades		•		•	25%	300 and 600 ml	
Mapeflex PU45	One-component polyurethane sealant and adhesive ideal for sealing joints in civil and industrial floors		•		•	20%	300 and 600 ml	
Mapeflex PU50 SL	One-component polyurethane sealant ideal for civil and industrial floors, shopping centres, car-parks and runways		•	•		25%	600 ml and 12 kg	
Mapeflex MS45	Hybrid elastic sealant and adhesive ideal for sealing joints in civil and industrial floors, suitable also for damp substrates		•		•	20%	300 ml	

## SIZE OF THE JOINT

The size of joints is fundamental and its importance is often underestimated. The **width of the joint** (a), which refers to the distance between the two sides, must be dimensioned according to the amount of expansion in the tiles and must never be less than 5 mm.

To set the depth of the joint and prevent sealant adhering to the bottom, insert *Mapefoam* closedcell, extruded foam polyethylene cord, supplied in rolls in various lengths according to the diameter of the cord, at the bottom of the joint. The **depth** (b) of the joint must be according to the following table:

a- width of joint	b - depth of joint
from 0 to 4 [mm]	increase the width of the joint
from 5 to 9 [mm]	b = a
from 10 to 20 [mm]	b = 10 [mm]
from 21 to 40 [mm]	b = a/2 [mm]
> 40 [mm]	reduce the width of the joint



## **HOW TO SEAL ELASTIC JOINTS**

#### Joints must be sealed as follows:



All the surfaces to be sealed must be dry, sound and free of all traces of substances that could affect adhesion of the sealant.

Place masking tape along the edges of the joint to make it easier to clean the tiles.



Insert *Mapefoam* cord in the joint to set the correct depth and to make sure the sealant sticks only to the sides of the joint and not to the bottom.



Apply primer with a brush on the surface of the areas of the joint to be sealed and leave it to dry for a few minutes.



Cut the tip off the cartridge and insert the cartridge in a sealant extrusion gun to extrude and apply the appropriate MAPEI sealant in the joint protected with masking tape.



Finish off the surface of the sealant with a suitable damp tool or a tool dipped in soapy water before skin forms on the surface. Remove the masking tape from along the sides of the joint.

## **SEALING CRITICAL AREAS**



Seal around the grate of floor drains with Mapesil AC.



Sealing in correspondence with skirting board-wall fillet joints with *Mapesil AC*.



Seal joints in stone and on external façades with Mapesil LM.

### **TYPES OF JOINT COVERED BY UNI 11493 ITALIAN STANDARDS**



**Structural joints:** joints created in correspondence with joints in the structure, they must include both the ceramic tiling and the entire thickness of the substrate.



*Expansion joints*: joints in the ceramic tiling only, they split the tiling into smaller pitch areas and limit the mechanical stresses due to temperature changes, for example.



**Distribution joints**: joints that go through the ceramic tiling and 1/3 of the thickness of the substrate to limit the mechanical stresses caused by movements of the building and members.



**Perimeter joints:** joints around the edge of tiling, for example floor tiles which border with vertical elements such as pillars, walls and kerbs.

Mapei Coloured Grouts	SEALANTS	lapesil AC	lapesil LM	EMENTITIOIS GROUTS	<b>Iltracolor Plus</b>	Saracolor A7	<b>Teracolor GG</b>	POLYMER GROUTS	Texeolor	EPOXY GROUTS	lareposy	Greposy P	Greposy IEG	Greposy CQ	ໃຈແຄງບນູງ <mark>Design</mark>	lapeQlitter
100 WHITE		•	•	0	•	•	•		•		•	2	ŋ	•	ß	
<b>103</b> MOON WHITE		•			•										•	
110 MANHATTAN 2000		•	•		•	•	•				•				•	
111 SILVER GREY		•			•	•	•		•		•			•	•	
282 BARDIGLIO GREY														٠		
112 MID GREY		•	•		•	•	•				٠					
113 CEMENT GREY		٠	•		٠	•	٠				٠	•	•	٠	•	
114 ANTHRACITE		۰	٠		۰	۰	٠				۰			۰	•	
120 BLACK		۰	۰		۰						۰			۰		
130 JASMINE		•	•		•	•	•				•		٠	٠	•	
<b>290</b> CREAM														٠		
131 VANILLA		•			•	•	•				•					
<b>132</b> BEIGE 2000		٠	•		٠	•	٠		٠		٠			٠	•	
160 MAGNOLIA		•			•	•	•				•			٠		
133 SAND (1997)		٠			٠										•	
134 SILK (1997)		٠			٠										•	
135 GOLDEN DUST (IIII)		۰			۰										•	
142 BROWN		•			•	•	•				٠				•	
141 CARAMEL		٠			٠	•	٠				٠					
140 CORAL		٠			٠	•	•				٠					
145 TERRA DI SIENA		•			٠	٠	۰				٠					
143 TERRACOTTA		۰			۰						۰					
147 CAPPUCCINO					_									٠		
136 MUD (1990)		•			۰										۰	
144 CHOCOLATE		۰			۰	۰	۰				۰					
146 DARK CHOCOLATE														۰		
149 VOLCANIC SAND		۰			•										•	
174 TORNADO 🞰		•			•										•	
170 CROCUS BLUE		•			•	•	•		_		•			•		
172 SPACE BLUE		•			•						•					
		•			•						٠					
173 OCEAN BLUE														•		
283 SEA BLUE														•		
														•		
181 JADE GREEN		•			•	•	•				•			•		
183 LIME														•		

The colours illustrated are for demonstration purposes only and may vary due to print limitations.

Mapei Coloured Grouts	SEALANTS	Mapesil AC	Mapesil LM	CEMENTITIOIS GROUTS	Ultracolor Plus	Kereolor A7	Kereolor GG	POLYMER GROUTS	Haroolor	EPOXY GROUTS	• Kerpan	Kereposy P	Kerepony leg	Kerepony Co	Kerpony Design	Mapeelitter
151 MUSTARD		•			•						•			•		
163 LILAC														•		
165 CHERRY RED														۰		
999 TRANSPARENT		•	•													
700 TRANSLUCENT															•	
<b>799</b> WHITE															•	
710 ICE WHITE															•	
728 DARK GREY															•	
729 SAHAKA															•	
720 PEARL GREY															•	
760 GOLD															•	
750 RED															•	
730 TURQUOISE															•	
740 BLUE															•	
LÎGHT GOLD SILVER																•
<u>Grout</u> Selection				ITIOIS GROUTS						POXY GROUTS						
103 MOON WHITE 🕬		•		<b>IENT</b>	٠										•	
110 MANHATTAN 2000		•		CEN	•										•	
111 SILVER GREY		•			•										•	<u> </u>
		•			•										•	
114 ANTHRACITE		•														
132 BEIGE 2000		•			•										•	
133 SAND (new)		•			•										•	
134 SILK (1990)		•			•										•	
135 GOLDEN DUST (1990)		٠			٠										•	
142 BROWN		٠			٠										•	
136 MUD ໜ		۰			٠										٠	
149 VOLCANIC SAND		۰			۰										•	
174 TORNADO		۰			۰										•	

Grout Selection: a choice of colours for grouting mortars with an unrivalled effect

Guide to Mapei solutions for bonding Ceramic Tiles and Stone Material

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## Rapid system for waterproofing and bonding ceramic on balconies



#### MAKING the BONDED SCREED

If a screed less than 4 cm thick needs to be made, it is important to apply **Topcem Pronto** in adherence with the substrate over a wet coat of epoxy resin such as Eporip or cementitious bonding slurry made from *Planicrete*, water and cement at a ratio of 1:1:3.

#### WATERPROOFING SYSTEM

When the screed is dry and cured, waterproof the surface by applying two criss-cross coats of Mapelastic AquaDefense with a roller, brush or trowel. Waterproof the fillets between horizontal/vertical surfaces and joints using Mapeband. Install the wall drain using a Drain **Front** kit sanded down to roughen the surface prior to embedding it in two layers of Adesilex PG4.

#### **BONDING the TILES**

"Rapid" bonding of the tiles may be carried out using rapidsetting, deformable cementitious adhesive (compatible with the elastic layer of *Mapelastic AquaDefense*), such as Elastorapid, Granirapid or Ultralite S1 Quick.

#### **GROUTING the TILES**

Once the adhesive has hardened, grout the tiles with Ultracolor Plus, rapid-setting and hardening, antiefflorescence, water-repellent grout.

#### SEALING the JOINTS

Seal the joints, changes in slope, corners and edges with a suitable elastic sealant such as *Mapesil AC* after setting the depth of the sealant with *Mapefoam*.

A MADE











#### System for waterproofing and bonding ceramic in bathrooms and damp rooms



11	Ready-to-use waterproofing product <b>Mapegum WPS</b> (2 coats)
12	Adhesive Ultramastic III
13	Ceramic tiles

14 Grouting Keracolor FF





#### MAKING the ISOLATED SCREED

Make the isolated screed by laying a vapour barrier and a sufficiently thick layer (more than 4 cm) of **Topcem Pronto** ready-mixed mortar. The rapid drying time of this product allows tiling to be bonded after 24 hours.

#### WATERPROOFING SYSTEM

After preparing the substrate as specified, apply two criss-cross coats of *Mapegum WPS* with a trowel, roller or brush to form a thick, elastic, seamless film. Waterproof the fillet joints between horizontal/vertical surfaces and joints with an elastic waterproofing product such as *Mapeband PE 120. Mapegum WPS* may also be applied on walls if the surface has been correctly prepared.

#### **BONDING the TILES**

When the *Mapegum WPS* has dried bond the wall and floor tiles with a cementitious adhesive such as *Keraflex* and with *Ultramastic III* on plasterboard waterproofed with *Mapegum WPS*.

#### **GROUTING the TILES**

When the adhesive has hardened, grout the tiles with *Kerapoxy CQ* two-component, easy-to-apply, anti-acid epoxy filler with excellent cleanability, or alternatively with *Ultracolor Plus* or *Keracolor FF*.

#### SEALING the JOINTS

Seal the joints, changes in slope, corners and edges with a suitable elastic sealant such as *Mapesil AC* after setting the depth of the sealant with *Mapefoam*. Seal the fillet joints between bathroom fittings and tiling, shower booths, etc. with an elastic sealant such as *Mapesil Z Plus*.















## System for bonding ceramic on heated screeds and soundproofed screeds

 Concrete substrate
 Soundproofing membrane Mapesilent Comfort
 Soundproofing strips Mapesilent Band R
 Soundproofing tape Mapesilent Tape
 Vapour barrier

3

- 6 Under-floor heating system
  7 Screed Topcem Pronto

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- 10 Grouting Keracolor FF
- Sealant Mapesil AC 
   Mapesil AC
   Malech

   Skim/smoothing layer *Planitop 560* 
   Skim/smoothing layer
   Planitop 560
   Malech

   Finishing product

**Colorite Performance** 



#### Under-SCREED SOUNDPROOFING SYSTEM

When the substrate is dry, lay out rolls of *Mapesilent Comfort* and seal all the overlaps with *Mapesilent Tape* soundproofing tape. Apply *Mapesilent Band R* along the bottom of the perimeter walls and around elements passing through the screed and seal the joints with *Mapesilent Tape*.

#### **RADIATING SCREED**

After laying a vapour barrier over the soundproofing material and installing the heating/cooling system, make the heated screed using *Topcem Pronto*, ramming the mortar around the pipework through which the water for the heating system flows. The thickness of the screed over the heating elements must be at least 3 cm, with metal mesh positioned at the mid-point to help distribute the stresses more evenly.

#### **BONDING the PORCELAIN TILES**

When the screed is dry, run the heating system (according to 1264-4 standards) and then bond the tiles using a deformable cementitious adhesive (class S1 according to EN 12004) such as *Keraflex Maxi S1 zerø*, *Ultralite S1* or *Kerabond* mixed with *Isolastic*.

#### **GROUTING the TILES**

When the adhesive has hardened, grout the tiles with cementitious mortar such as *Ultracolor Plus* or *Keracolor FF*. After grouting the tiles trim the excess portions of the *Mapesilent Band R* strip.

#### SEALING the JOINTS

Seal the joints and the skirting board with a suitable sealant such as *Mapesil AC*. Make sure the skirting board is not in direct contact with the flooring to get the best soundproofing effect from the system.











#### System for waterproofing and bonding glass mosaic in swimming pools



#### PREPARATION of the SUBSTRATE

Even out the surface of the substrate (well cured and mechanically strong with no traces of form-release compound), for both walls and floors, with *Planitop* Fast 330. Alternatively, even out the surface of floors with Topcem Pronto bonded to the substrate with *Eporip*. Form coving around the perimeter made from *Mapegrout 430* bonded to the substrate with *Eporip*.

#### WATERPROOFING SYSTEM

After evening out the vertical and horizontal surfaces, waterproof the surfaces prepared as specified with two coats of Mapelastic Smart reinforced with Mapetex Sel non-woven fabric. The total thickness of the waterproofing layer must be at least 2 mm.

#### **BONDING the GLASS MOSAIC**

Bond the glass mosaic in swimming pools with Adesilex P10 cementitious adhesive mixed with Isolastic latex at a ratio of 1:1 with water. This adhesive stands out from the others for its high white balance which makes it particularly suitable for bonding glass mosaics.

#### **GROUTING the TILES**

When the adhesive has hardened, grout the mosaic with Kerapoxy Design acid-resistant, decorative, translucent epoxy mortar.

#### **SEALING the JOINTS**

Apply *Mapesil AC* elastic sealant in correspondence with the edges, corners, joints and changes in slope,













## System for bonding strips of terracotta on walls and overlaying porcelain tiles on existing floors



#### LEVELLING OFF and PREPARING the SUBSTRATE

Repair areas of detached render with Nivoplan mixed with Planicrete or with Planitop Fast 330. Before overlaying old ceramic flooring (with no cracks and well bonded to the substrate) clean the surface with a suitable dewaxing product or caustic soda diluted in water or sand the surface of the tiles.

#### **BONDING the PORCELAIN TILES and STRIPS of TERRACOTTA**

Class 2 MAPEI cementitious adhesives according to EN 12004 standards, such as *Keraflex*, bond well to the flooring as long as there are no materials or substances that could affect its adhesion (dust. oil. wax. etc.).

Use Fix & Grout Brick adhesive to bond strips of terracotta and ornamental elements in lightweight cementitious conglomerate.

#### **GROUTING the TILES**

Smooth over traces of Fix & Grout Brick applied on walls with a damp brush to grout the gaps between the strips of terracotta. Grout the porcelain floor tiles, on the other hand, with cementitious mortar such as Ultracolor Plus.

#### **SEALING the JOINTS**

Seal the joints, changes in slope, corners and edges with a suitable elastic sealant such as Mapesil AC after setting the depth of the sealant with *Mapefoam*.















#### System for bonding large, thin ceramic tiles on façades and installing porphyry block flooring





10 Slim porcelain tiles

11 Sealant Mapesil LM



#### **PREPARATION** of the SUBSTRATE

Render must be clean, well cured, dry, flat and sound and with sufficient pull-off strength. Repair detached areas of render with *Into+* made by *Vaga*. The pull-off strength of the render must be at least 1 N/mm<sup>2</sup>.

#### **BONDING SLIM PORCELAIN TILES on FACADES**

In order to bond tiles on façades, particularly large slim tiles, it is very important to use deformable adhesive (class S1 or S2 according to EN 12004) such as *Ultralite S2* applied using the double-buttering technique so that there are no gaps on the back of the tiles.

#### **GROUTING the TILES**

The joints must be at least 5 mm wide and may be grouted with *Ultracolor Plus* rapid-setting and hardening, anti-efflorescence, water-repellent cementitious mortar.

#### SEALING the JOINTS

Seal all the corners, edges and expansion joints (dimensioned according to the pitch of the tiles) using a product with low modulus of elasticity and low dirt pick up, such as *Mapesil LM*.

#### **ARCHITECTONIC STONE FLOORS**

The *Mapestone* system is used to make architectonic stone floors (made from small blocks, smolleri bricks, cobblestones, etc.).













## Mapetherm Tile System for bonding thin porcelain tiles on thermal cladding systems



#### **BONDING the INSULATING PANELS**

On a clean, well-cured, dry substrate with sufficient pull-off strength (1 N/mm<sup>2</sup>), bond the *Mapetherm EPS* insulating panels (or alternatively *Mapetherm XPS*) with *Mapetherm AR1* cementitious adhesive applied using the double-buttering technique (over all the surface of the panel and on the substrate).

#### **REINFORCED RENDER**

Form a layer of structural render over the insulating panels (around 1 cm thick) made from *Planitop HDM Maxi* two-component fibre-reinforced mortar with *Mapegrid* **G** 120 A.R. glass fibre mesh embedded in the mortar. Stainless steel *Mapetherm Tile Fix* 15 fasteners, with the washers positioned over the mesh, complete the support system for the ceramic covering.

#### **BONDING the THIN PORCELAIN TILES**

Bond the thin porcelain tiles (maximum size 50x150 cm) with highly deformable adhesive (class S2 according to EN 12004) such as *Ultralite* S2 applied using the double-buttering technique.

#### **GROUTING the TILES**

The joints must be at least 5 mm wide and may be grouted with a cementitious product such as *Keracolor GG* mixed with the polymer admixture *Fugolastic*.

#### SEALING the JOINTS

Seal all the corners, edges and expansion joints (dimensioned according to the pitch of the tiles) using a product with low modulus of elasticity and low dirt pick up, such as *Mapesil LM*.













#### LEVELLING OFF and PREPARING the SUBSTRATE

Smooth over the old flooring with Adesilex P4 after cleaning the surface with a suitable detergent and/or by abrading the surface with power tools.

#### WATERPROOFING SYSTEM

Waterproof the surface by applying two criss-cross coats of Mapelastic Turbo over the smoothing laver with a trowel, roller, brush or by spray to form a thick, elastic, seamless film. Waterproof the fillets between horizontal/ vertical surfaces and joints using Mapeband SA self-adhesive tape or alternatively with Mapeband.

#### **BONDING the FLOORING**

Bond the tiles with a sufficiently deformable adhesive (compatible with the elastic laver of Mapelastic Turbo) such as Keraflex Maxi S1 or, as an alternative, Elastorapid.

#### **GROUTING the TILES**

When the adhesive has hardened, grout the tiles with a cementitious product such as Ultracolor Plus or, as an alternative, Keracolor GG mixed with the polymer admixture Fugolastic.

#### SEALING the JOINTS

Seal the joints, corners and edges with a suitable elastic sealant such as Mapesil AC after setting the depth of the sealant with Mapefoam.











#### System for waterproofing and bonding ceramic on terraces and flat roofs by overlaying existing flooring and for bonding natural stone on façades



#### LEVELLING OFF and PREPARING the SUBSTRATE

Smooth over the old flooring with *Adesilex P4* after cleaning the surface with a suitable detergent and/or by abrading the surface with power tools. Remove the skirting boards along with at least 1.5 cm of the render behind the skirting. Fill the gap in the render with *Planitop Fast 330*.

#### WATERPROOFING SYSTEM

Apply two coats of *Mapelastic* with a metal trowel over the skim/smoothing layer to form a layer at least 2 mm thick. Reinforce the waterproofing layer by placing *Mapenet 150* alkali-resistant glass fibre mesh between the two coats of waterproofing product. Waterproof the fillets between horizontal/vertical surfaces and joints using *Mapeband*. Install a floor drain using a *Drain Vertical/Lateral* kit.

#### **BONDING the TILES**

Bond the tiles with a sufficiently deformable adhesive (compatible with the elastic layer of *Mapelastic*) such as *Keraflex Maxi S1 zerø* or, as an alternative, *Ultralite S2 Quick*.

#### **GROUTING the TILES**

When the adhesive has hardened, grout the tiles with a cementitious product such as *Ultracolor Plus* or, as an alternative, *Keracolor GG* mixed with the polymer admixture *Fugolastic*.

#### SEALING the JOINTS

Seal the joints, corners and edges, after setting the depth of the joint with *Mapefoam*, with a suitable sealant such as *Mapeflex PU45* or, as an alternative, *Mapesil LM* if the sealant is in contact with stone material.











## **10** Rapid system for overlaying old flooring with underfloor soundproofing



#### SOUNDPROOFING against the NOISE of FOOTSTEPS

After applying *Mapesonic Strip* adhesive tape along the walls around the perimeter of the room, lay sheets of Mapesonic CR bonded with Ultrabond Eco V4 SP adhesive for absorbent substrates (cementitious screeds or skim/smoothing layers) or, as an alternative, Ultrabond Eco S955 1K for non-absorbent substrates.

#### **BONDING the PORCELAIN TILES**

At least 24-48 hours after laying the sheets, bond the new flooring with deformable cementitious adhesive such as Granirapid or Elastorapid.

#### **GROUTING the TILES**

When the adhesive has hardened, grout the tiles with Kerapoxy CQ two-component, easy-to-apply, anti-acid epoxy filler with excellent cleanability. After grouting the tiles, trim the excess portions of *Mapesonic Strip* along the walls. As an alternative, the tiles may be grouted with cementitious mortar such as Ultracolor Plus or Keracolor GG.

#### **SEALING the JOINTS**

It is very important that, when applying the skirting boards around the room, they do not come into direct contact with the floor, so the joint between the skirting and the flooring must be sealed with *Mapesil AC*.













## **11** System for bonding thin porcelain tiles on compact heating systems (UPONOR system)







11 Finishing product Silexcolor Marmorino



#### COMPACT HEATED SCREED

Thoroughly clean the flooring with water and caustic soda or a special de-waxing product, and sand the surface if required.

After applying a coat of *Eco Prim T* primer, install the compact heating system (UPONOR) and smooth over the surface with *Novoplan Maxi*.

#### **BONDING THE THIN PORCELAIN TILES**

When **Novoplan Maxi** is dry, and after running the heating system, bond the porcelain tiles using a deformable cementitious adhesive such as **Ultralite S1**, **Keraflex Maxi S1** (up to 5000 cm<sup>2</sup>) **Kerabond** mixed with **Isolastic** or **Ultralite S2** (more than 5000 cm<sup>2</sup>).

#### **GROUTING the TILES**

When the adhesive has hardened grout the gaps between the tiles, which must be wide enough to cushion deformations induced by the heating system. *Ultracolor Plus* or, as an alternative, *Keracolor FF* may be used in this case.

#### SEALING the JOINTS

Seal the distribution joints, positioned according to design specifications, with a suitable product such as *Mapesil AC* or *Mapeflex PU45*.













## **12** Rapid system for repaired and new flooring in commercial areas



#### **BAPID SETTING and HARDENING ISOLATED SCREED**

In commercial areas, where work needs to be carried out without removing the old flooring, an isolated screed (using sheets of polyethylene) at least 4 cm thick reinforced with electro-welded mesh at the midpoint must be installed. Make the screed from *Mapecem Pronto*, which allows ceramic to be bonded after 3-4 hours and reaches a high level of strength very quickly.

#### **BONDING the PORCELAIN TILES**

Once the screed has dried and cured according to specification and the joints in the screed have been created, bond the tiles with Granirapid or Elastorapid rapid-setting, high-strength adhesive, which sets to foot traffic after just 3 hours and allows flooring to be put into service after just 24 hours.

#### **GROUTING the TILES**

When the adhesive has hardened, grout the gaps between the tiles (dimensioned according to specification) with Ultracolor Plus, high-strength, rapid-setting and hardening cementitious mortar with high resistance to abrasion.

#### **SEALING the JOINTS**

Seal the joints with a high-strength, elastic product such as Mapeflex PU20 after setting the depth of the joints with Mapefoam.













**13** System for bonding ceramic on cementitious substrates with hair-line cracks and on concrete walls



#### MAPETEX SYSTEM

**Mapetex System** prevents the risk of cracks forming in ceramic or stone flooring installed on screeds with hairline cracks, on screeds that are not fully cured or on old, deteriorated flooring.

The system consists in bonding isolating fabric directly on the screed.

#### **BONDING the PORCELAIN TILES**

The tiles may be bonded to the floor with the same adhesive used to bond *Mapetex* (such as *Kerabond* + *Isolastic*). Bond porcelain tiles on the vertical surfaces of reinforced concrete with cementitious adhesive such as *Keraflex*, as long as the substrate is well-cured, strong and sufficiently flat and has no crumbling areas or traces of form-release compound or any other material or substance that could affect adhesion of the tiles.

#### **GROUTING the TILES**

When the adhesive has hardened, grout the tiles with cementitious mortar such as *Keracolor GG* or, as an alternative, *Keracolor FF*.

#### SEALING the JOINTS

Seal the joints with a suitable elastic sealant such as *Mapesil AC* after setting the depth of the joints with *Mapefoam*.











## **14** System for waterproofing and bonding ceramic on balconies and flat roofs





10 11	Sealant Mapesil LM (C) (a) (b) Concrete
12 13	Adhesive Ultralite S2
14	Grouting Ultracolor Plus (a) () () () () () () () () () () () () ()



#### MAKING the ISOLATED SCREED

Install a sufficiently thick isolated screed (> 4 cm) made from *Topcem Pronto* over an adequate vapour barrier.

#### WATERPROOFING SYSTEM

Apply two coats of *Mapelastic Smart* over the substrate with a notched trowel, brush or roller to form a layer at least 2 mm thick. Reinforce the waterproofing layer with *Mapetex Sel*. Waterproof the fillets between the horizontal/vertical surfaces and the joints by completely embedding strips of *Mapeband* in the layer of *Mapelastic Smart*.

#### **BONDING the STONE on WALLS and FLOORS**

Bond the slabs of stone on floors with a sufficiently deformable adhesive (compatible with the elastic layer of *Mapelastic Smart*) such as *Ultralite S1 Quick* or *Keraflex Maxi S1* and on walls with *Ultralite S2*.

#### **GROUTING the TILES**

When the adhesive has hardened, grout the stone with a cementitious product such as *Ultracolor Plus*.

#### SEALING the JOINTS

Seal the joints in natural stone floor and wall coverings with an elastic sealant whose neutral-hardening properties have no affect on the colour of the stone, such as *Mapesil LM*.

A MAPE















#### MAKING the SCREED

If a screed less than 4 cm thick needs to be made, it is important to apply Topcem Pronto in adherence with the substrate over a wet coat of epoxy resin such as Eporip or cementitious bonding slurry made from *Planicrete*, water and cement at a ratio of 1:1:3.

#### **BONDING the TILES**

Once the screed is well cured bond the tiles with strong cementitious adhesive with high compressive strength such as **Elastorapid** or **Granirapid** using the doublebuttering technique.

To bond the tiles on walls, where high mechanical strength is not required but it is important to guarantee the back of the tiles is completely bonded, use a lightweight adhesive such as Ultralite S1.

#### **GROUTING the TILES**

When the adhesive has hardened grout the tiles with Kerapoxy CQ anti-acid, easy-to-apply epoxy grout with excellent cleanability.

#### SEALING the JOINTS

Because of the sheer size of this type of environment, it is important that the joints are dimensioned correctly and that they are sealed with products with appropriate mechanical and chemical characteristics such as Mapeflex PU45 and Mapeflex PU20 around the perimeter of the area.













## **16** System for bonding porcelain tiles in areas subjected to severe chemical aggression











#### MAKING the ISOLATED SCREED

Install an isolated screed made from **Topcem** applied over an adequate vapour barrier. Position the electrowelded mesh at the mid-point of the screed, which must be at least 4 cm thick, so that it distributes the stresses acting on the floor.

Apply a layer of *Planitop Fast 330* to level off or repair the vertical surface of the render.

#### **BONDING the PORCELAIN TILES**

Bond the tiles with epoxy adhesive such as *Kerapoxy* or *Kerapoxy Adhesive*. The use of reactive adhesive to bond the tiles increases the chemical resistance of the flooring, which in this case is guaranteed by both the grouted tiles and the installation surface. A uniform layer of adhesive, therefore, also forms a protective barrier for the substrate.

#### **GROUTING the TILES**

When the adhesive has hardened grout the tiles, positioned to leave a suitable size gap, with *Kerapoxy CQ* or *Kerapoxy IEG*, epoxy grout with very high resistance to chemicals, particularly oleic acid and aromatic hydrocarbons.

#### SEALING the JOINTS

Seal the joints with a high-strength product with high resistance to chemicals such as *Mapeflex PU20* after setting the depth of the joints, where required, with *Mapefoam*.













### **17** System for bonding natural stone in damp environments





6 Waterproofing product Mapelastic

7 Adhesive Granirapid

8 Red marble





#### MAKING the BONDED SCREED

If a screed less than 4 cm thick needs to be made, it is important to apply *Topcem Pronto* in adherence with the substrate over a wet coat of epoxy resin such as *Eporip* or cementitious bonding slurry made from *Planicrete*, water and cement at a ratio of 1:1:3.

#### WATERPROOFING SYSTEM

Apply two coats of *Mapelastic* over the substrate with a notched trowel to form a layer at least 2 mm thick reinforced with *Mapenet 150*. Waterproof the fillets between the horizontal/vertical surfaces and the joints by completely embedding strips of *Mapeband* in the layer of *Mapelastic*.

#### BONDING the RED MARBLE

After waiting the specified time to allow the *Mapelastic* to dry bond the stone material with *Granirapid* or *Elastorapid* (depending on the type of material used).

#### **GROUTING the TILES**

Grout the stone (minimum gap 5 mm) with *Ultracolor Plus* rapid-setting and hardening, anti-efflorescence, water-repellent cementitious mortar.

#### SEALING the JOINTS

Seal the joints in natural stone with an elastic sealant whose neutral-hardening properties have no affect on the colour of the stone, such as *Mapesil LM*.











# System for waterproofing and bonding ceramic in shower booths, bathrooms and changing rooms by overlaying existing flooring



#### LEVELLING OFF and PREPARING the SUBSTRATE

After checking the condition of the flooring and carrying out a thorough cleaning, apply a layer of Nivorapid cementitious smoothing compound after applying a coat of Eco Prim Grip primer and bonding promoter.

#### WATERPROOFING SYSTEM

After preparing the substrate as specified, apply two criss-cross coats of Mapegum WPS with a trowel, roller, brush or spray to form a thick, elastic, seamless film. Waterproof the fillets between the horizontal/vertical surfaces and the joints with Mapeband PE 120 and install a floor drain using a Drain Vertical/Lateral kit.

#### BONDING the TILES and MOSAIC

Bond the porcelain tiles with cementitious adhesive such as Ultralite Flex and the glass mosaic with Adesilex P10 cementitious adhesive mixed with *Isolastic* latex diluted at a ratio of 1:1 with water.

#### **GROUTING the TILES**

When the adhesive has hardened, grout the tiles with Kerapoxy CQ, two-component, easy-to-apply, antiacid epoxy filler with excellent cleanability. In damp environments we recommend grouting the glass mosaic with Kerapoxy Design decorative, anti-acid, translucent epoxy grout.

#### **SEALING the JOINTS**

Seal the joints, corners and edges with a suitable elastic sealant such as *Mapesil AC* after setting the depth of the sealant with Mapefoam.























#### Technical documentation

From the technical area menu you can view the technical documentation divided per product lines and type of document

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