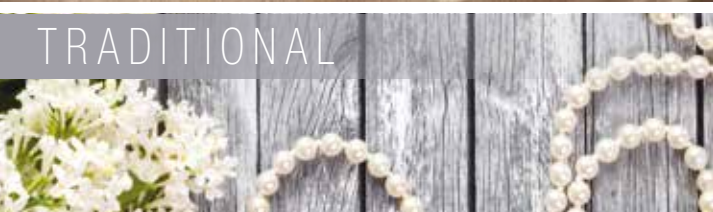


SELECTION CHART OF GROUTS AND FLEXIBLE JOINTS

SERENE



TRADITIONAL



NATURAL



ROMANCE



GLAMOUR



NEW GROUT COLOUR COLLECTIONS **SET the MOOD**

Personalize your space
with the new Mapei grout
colour collections





SET the MOOD

Personalize your space with the new Mapei grout colour collections.

SERENE



TRADITIONAL



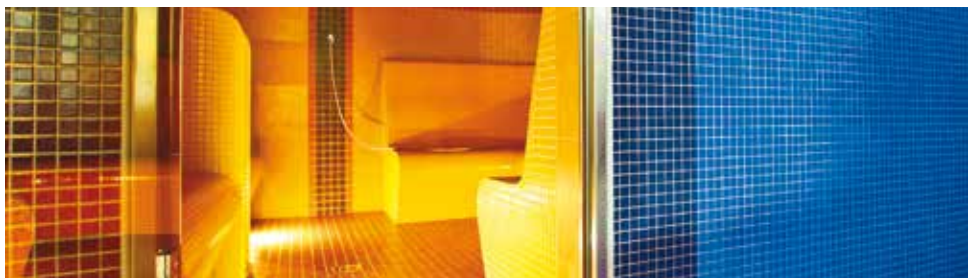
NATURAL



ROMANCE



GLAMOUR



Learn more on grouts.mapei.com



Mapei Coloured Grouts

The grout that decorates... your world

Beauty which resists everything.

A range of high-quality, highly-functional products rich in colour for internal and external use. Solvent-free, with very low emission level of volatile organic compounds (VOC) and certified in compliance with the most strict international standards. Suitable for all types and formats of floors and walls: ceramic tiles, terracotta, stone material, mosaics and metal. Available as cementitious, grouting paste and epoxy grout.

Mapei Coloured Grouts. The choice that completes every project. From Mapei, world leader in the production of grouts and adhesives.



EASY TO CLEAN



MOULD RESISTANT



DURABLE AND STRONG



WIDE RANGE OF COLOURS



Ultracolor Plus The safest joint. Mould proof

Cementitious grout with a perfect uniform colour.

- For internal and external use
- Anti-efflorescence
- Water-repellent with DropEffect®
- Mould resistant with BioBlock® technology
- Available in 34 colours
- Very low emission level of volatile organic compounds (VOC)
- Classified CG2WA according to EN13888



CEMENTITIOUS GROUTS

Mapei **has a complete range of grouts for all types of internal and external ceramic, terracotta, stone and glass mosaic floors and walls.**

For example, cementitious grouts are **particularly suitable for residential use** such as bathrooms, kitchens, swimming pools, external façades, balconies and terraces, for commercial environments such as grouting tiles in supermarkets, restaurants, airports and public buildings and for floors in industrial environments.

CEMENTITIOUS GROUTS



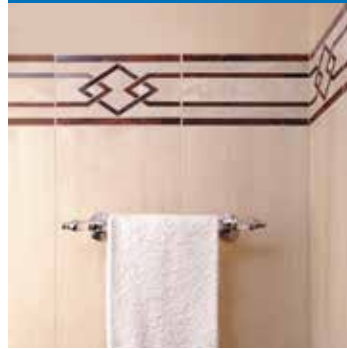
Ultracolor Plus



- ▶ High-performance **mortar** for joints from **2 to 20 mm**
- ▶ Anti-efflorescence and mould-resistant (**BioBlock®**)
- ▶ Water-repellent (**DropEffect®**)
- ▶ **Polymer-modified**
- ▶ Available in **34 different colours**
- ▶ For **internal** and **external** use
- ▶ For all types of ceramic, stone, glass mosaic and marble **floors** and **walls**
- ▶ For **swimming pools**



Keracolor FF



- ▶ High-performance **mortar** for joints up to **6 mm**
- ▶ Water-repellent (**DropEffect®**)
- ▶ **Polymer-modified**
- ▶ Available in **14 different colours**
- ▶ For **internal** and **external** use
- ▶ For all types of ceramic, stone, glass mosaic and marble **floors** and **coatings**
- ▶ For **swimming pools**



Keracolor SF



- ▶ High-performance **mortar** for joints **up to 4 mm**
- ▶ **Smooth, white**, compact and super fine
- ▶ **Polymer-modified**
- ▶ For **internal** and **external** use
- ▶ For all types of pre-polished ceramic, terracotta, glass mosaic, stone and marble **floors** and **walls**
- ▶ **Ideal for grouting thin joints**



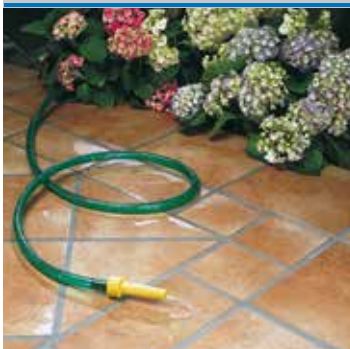
Keracolor GG



- ▶ High-performance **mortar** for joints from **4 to 15 mm**
- ▶ **Polymer-modified**
- ▶ Available in **14 different colours**
- ▶ For **internal** and **external** use
- ▶ For all types of ceramic, terracotta, natural brick and stone **floors** and **coatings**
- ▶ For **swimming pools**



Fugolastic



- ▶ **Liquid polymeric admixture** for Keracolor FF, Keracolor GG and Keracolor SF



Fuga Fresca



- ▶ **Acrylic resin-based paint in water dispersion** to bring back the colour of joints between ceramic tiles
- ▶ Available in **34 different colours** (all colours from the **Keracolor** and **Ultracolor Plus** range)



Keranet



- ▶ **Acid-based cleaning solution** for ceramic tiles with **cementitious joints** available in powder and liquid form, supplied ready-to-use



Kerapoxy Range **...acid proof**

A special range of epoxy grouts developed specifically for the industrial sector.

- For internal and external use
- Very high strength and chemical resistance
- Very high resistance to alkalis and hydrocarbons
- Non-absorbent
- Very hygienic
- Available in a wide range of colours
- Very low emission level of volatile organic compounds (VOC)
- Classified RG according to EN 13888
- Suitable for surfaces in direct contact with foodstuff in compliance with the HACCP System - EC REG. 852/04

KERAPOXY:



KERAPOXY DESIGN:



KERAPOXY CQ:



KERAPOXY IEG:



KERAPOXY P:



EPOXY GROUTS

Thanks to their technical characteristics, the range of grouting materials for epoxy joints is particularly suitable when **particular requirements for hygiene** and **resistance to aggressive chemicals** are required.

They are used, therefore, in **residential** and **commercial environments** to guarantee a **highly attractive** and **decorative finish** and **no absorption** along with their good performance figures, and in all **industrial environments** where very high **resistance to chemicals and high strength** are required, together with **resistance to acids and hydrocarbons**, such as for floors in the foodstuffs industries (meat factories, oil mills, etc.).



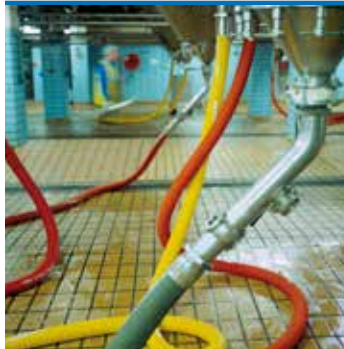
Kerapoxy



- ▶ **Two-component anti-acid mortar** for joints of at least **3 mm**
- ▶ Available in **20 different colours**
- ▶ For **internal and external** use
- ▶ For **ceramic tiles, stone, cement-fibre and concrete**
- ▶ Ideal for **commercial environments**
- ▶ Suitable for **work-tops**
- ▶ May **also** be used as **adhesive**



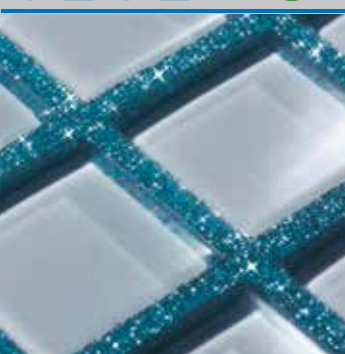
Kerapoxy IEG



- ▶ **Two-component anti-acid mortar** for joints of at least **3 mm**
- ▶ **Very high strength and chemical resistance**
- ▶ **Resistance to oily acids and aromatic hydrocarbons**, including at high temperatures
- ▶ **Smooth, compact, non-absorbent, easy-to-clean surface**
- ▶ Available in colours **113 and 130** from the standard range
- ▶ For **ceramic floors or stone material** in the foodstuffs industries (ham curers, meat factories, oil mills, etc.)



Kerapoxy Design



- ▶ **Two-component anti-acid mortar**
- ▶ **Highly attractive finish**
- ▶ **Translucent finish**
- ▶ Available in **32 different colours and translucent**
- ▶ For **internal and external** use
- ▶ For all types of ceramic and stone with a decorative, attractive finish for **floors and coatings**
- ▶ Ideal for **glass mosaic**
- ▶ May also be used as **adhesive**
- ▶ May be mixed with **MapeGlitter** for a wider range of colours and special ornamental finishes



Kerapoxy CQ



- ▶ **Two-component anti-acid filler**, ideal for grouting joints between ceramic tiles and mosaics or **stone material**
- ▶ **With a bacteriostatic agent and BioBlock® technology**: it prevents the proliferation of bacteria and the formation of mould on the surfaces of grouts, making tiled surfaces hygienic and safe
- ▶ Product **certified by the University of Modena** according to **ISO 22196:2007 standards** as a **grouting mortar protected against the formation and proliferation of micro-organisms**
- ▶ **Easy to apply**
- ▶ **Very high strength and chemical resistance**
- ▶ Excellent **workability** and **easy to clean**
- ▶ Excellent **resistance to heavy traffic**
- ▶ Available in **19 colours**
- ▶ For industrial ceramic **floors and coatings** where **high strength** and a **high level of hygiene** are required
- ▶ May **also** be used as **adhesive**



MapeGlitter

- ▶ **Metallic coloured glitter**
- ▶ Added to **Kerapoxy Design** up to 10% by weight, to make **grouting mortar** with a **shiny, metallic finish**
- ▶ Available in **Light Gold** and **Silver**
- ▶ Ideal for **metal tiles, mosaic and glass tiles**



Kerapoxy P

- ▶ **Two-component anti-acid mortar** for joints of at least **3 mm**
- ▶ **Very high strength and chemical resistance**
- ▶ Suitable for **large surfaces**
- ▶ **Easy to apply by trowel**
- ▶ Available in colour **113** from the standard range
- ▶ For industrial ceramic **floors or stone material and coatings**, including particularly large spreads



Kerapoxy Cleaner

- ▶ **Special cleaner** for epoxy grout
- ▶ Suitable for **cleaning operations after completing laying work** and for **removing traces and stains of epoxy grout** (such as **Kerapoxy, Kerapoxy P, Kerapoxy Design and Kerapoxy CQ**) from the surface of **ceramic and glass coverings**



Flexcolor

Polymer filler paste for grouting joints in ceramic tiles.

- For internal walls and floors, for external walls
- For joints from 2 to 10 mm
- Ready to use
- Water-repellent (DropEffect®)
- Mould-resistant (BioBlock®)
- Available in 3 colours

READY-TO-USE PASTE PRODUCTS

Mapei has developed a range of **paste products** which, because of their nature, are particularly **easy to use**. The range includes a **flexible polymer grout** suitable for coatings on façades, including those applied on flexible substrates, and a **highly thixotropic adhesive paste** which bonds immediately with no slip.



Flexcolor

- ▶ Paste **filler** for joints from **2 to 10 mm**
- ▶ **Ready to use**
- ▶ Mould-resistant (**BioBlock®**)
- ▶ Water-repellent (**DropEffect®**)
- ▶ Available in **white (100)**, **silver grey (111)** and **beige 2000 (132)**
- ▶ For **internal floors** and **internal and external walls**
- ▶ For **ceramic tiles** and **mosaic**
- ▶ Ideal for **flexible substrates**



Fix & Grout Brick

- ▶ **Adhesive paste** for internal and external bonding
- ▶ **Ready to use**
- ▶ **Easy to apply**, guaranteed laying
- ▶ Mould-resistant with **BioBlock®** technology
- ▶ Available in **white (100)**, **cement grey (113)** and **beige 2000 (132)**
- ▶ **Highly flexible**, excellent bond, good resistance to UV rays and ageing
- ▶ **Resistant to temperatures up to +70°C**
- ▶ Thixotropic consistency for an **immediate bond with no slip**
- ▶ Particularly **suitable for brick slips and cementitious conglomerate elements lightened with synthetic resin**



Choose Mapestone. Time will prove you right.

Traditional stone flooring
with signs of deterioration

Stone flooring installed with
Mapestone® System - durable and long-lasting

Mapestone System

The innovative installation system for porphyry and interlocking stone flooring, to make installing quick and long-lasting.

- Less maintenance
- Less noise
- Lower risk of falling
- Flooring rapidly put into service
- Resistant to freeze-thaw cycles and de-icing salts
- High resistance to wear and tear from public transport and commercial vehicles

JOINTS IN ARCHITECTONIC STONE FLOORING

Mapei has developed a range of **special products for grouting architectonic stone flooring** which are ideal for use under various conditions, such as to withstand **heavy loads** and **intense traffic**. Paving stones are used to make the most beautiful squares and ancient town centres, but are also used for **pedestrian areas, pavements, cycle lanes and heavily trafficked roads**, as well as in **residential buildings** such as for external courtyards, stairways and landings.



Keracolor PPN



- ▶ **Pozzolan quick-setting mortar** for grouting paved floors with joints **from 5 to 30 mm**
- ▶ **Very low water absorption**
- ▶ **High mechanical strength**
- ▶ **Ideal for stone floors** subjected to **heavy loads and intense traffic**, such as courtyards in commercial centres, car-parks and public squares and roads with urban traffic



Mapestone PFS 2

- ▶ **Pre-blended mortar** for grouting joints in architectonic stone flooring
- ▶ **High compressive strength** (C30/37/XF4)
- ▶ **High resistance to freezing weather** (XF3)
- ▶ **High resistance to de-icing salts** (XF4 exposure class)
- ▶ **High resistance to abrasion**
- ▶ **Suitable for grouting architectonic flooring** made from small blocks, smaller bricks, cobblestones, slabs or blocks
- ▶ **Suitable for making piazzas, roads, pavements, car-parks, pedestrian crossings, roundabouts and speed humps**

Mapestone PFS PCC 2



- ▶ **Pre-blended, polymer-modified mortar** for grouting joints in architectonic stone flooring
- ▶ **Low modulus of elasticity** (20 GPa)
- ▶ **High resistance to freezing weather** (XF3)
- ▶ **High resistance to de-icing salts** (XF4 exposure class)
- ▶ **High resistance to abrasion**
- ▶ **Suitable for grouting architectonic flooring** made from small blocks, smaller bricks, cobblestones, slabs or blocks
- ▶ **Suitable for use in piazzas, roads, pavements, car-parks, pedestrian crossings, roundabouts and speed humps**



A complete range of coloured products for any request of sealing of floorings and coatings made of ceramic tiles, natural stone and glass mosaics.

- Easy to use
- High performances
- Quick to apply
- Wide range of colours
- Granted results
- Certified according to the most severe international standards
- With very low emission level of volatile organic compounds (VOC)

ELASTIC JOINTS

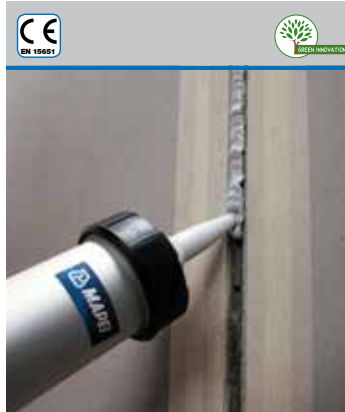
Mapei has a **complete range of sealants** developed through constant research with the aim of introducing **high quality products** on the market to make application **easy, quick** and **guaranteed**. Only a few of the products from the range are presented in this document, and their characteristics make them suitable for specific applications for ceramic, natural and glass floor finishes. In particular, several one and two-component acrylic, silicone and polyurethane sealants will be presented.

FLEXIBLE JOINTS



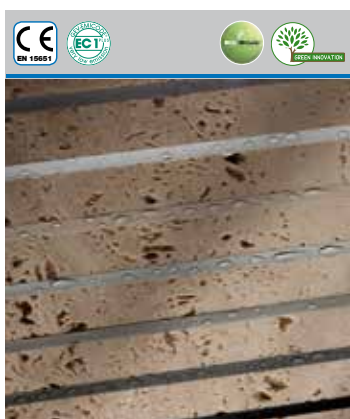
Mapesil AC

- ▶ Pure acetic **silicone sealant**
- ▶ **Contains no solvents**
- ▶ **Low modulus of elasticity**
- ▶ **Mould resistant**
- ▶ **High strength, high thermal and chemical resistance**
- ▶ Available in **34 different colours and transparent**
- ▶ For **glass, ceramic, sanitary wares and varnished surfaces**
- ▶ Ideal for **floor joints** and **grouting tiles in damp environments** and **swimming pools**
- ▶ May be used on concrete, wood, metal, plastics and rubber after treating with **Primer FD**



Mapeflex PU40

- ▶ One-component thixotropic **polyurethane sealant**
- ▶ **Low modulus of elasticity** to avoid detachment from the edges of joints
- ▶ **Paintable**
- ▶ **High bond strength**, no primer required
- ▶ **Highly flexible** even at low temperatures
- ▶ Available in **white** and **grey (111)** (other colours upon request)
- ▶ For **expansion** and **fillet joints** on pre-cast buildings, traditional and ventilated façades, sealing cracks



Mapesil LM

- ▶ Neutral **silicone sealant**
- ▶ **Odourless**
- ▶ **Does not stain** stone surfaces
- ▶ **High bond strength** with no primer on a wide range of substrates
- ▶ Excellent **resistance to inclement weather and ageing**
- ▶ Available in **white (100), manhattan 2000 (110), silver grey (111), grey (112), cement grey (113), grey (114), black (120), Jasmine (130), beige 2000 (132)** and **transparent**
- ▶ **Ideal for natural stone and ceramic tiles on façades**



Mapeflex PU50 SL

- ▶ One-component high flow **polyurethane sealant**
- ▶ **High flow**, quick and easy application on floors
- ▶ **Low modulus of elasticity** to avoid detachment from the edges of joints
- ▶ **Paintable**
- ▶ **High bond strength**, no primer required
- ▶ **Highly flexible** even at low temperatures
- ▶ Available in **grey (111)**
- ▶ Ideal for **civil and industrial floors, shopping centres, car-parks** and runways subjected to large movements and with a slope up to 2%



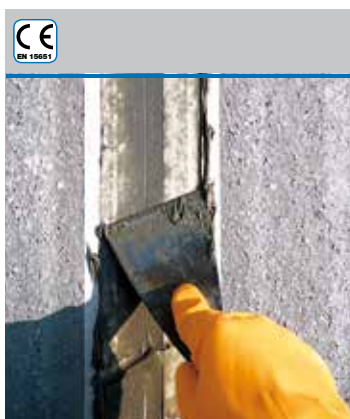
Mapeflex PU20

- ▶ **Two-component**, high flow epoxy-polyurethane **sealant**
- ▶ **High modulus of elasticity**, high strength
- ▶ **High chemical resistance**
- ▶ **High flow**, quick and easy application on floors
- ▶ **Pre-dosed two-component product**
- ▶ Available in **grey (113)**
- ▶ Ideal for **industrial floors, car-parks, garages, courtyards, commercial areas, warehouses and production areas**



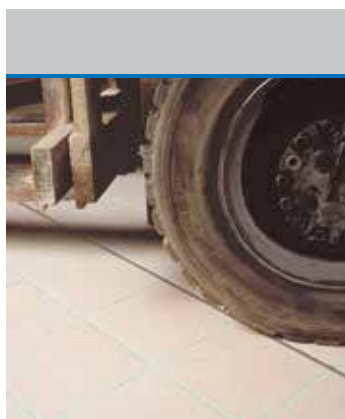
Mapeflex PU 45 FT

- ▶ One-component, thixotropic polyurethane **sealant and adhesive**
- ▶ **Single product for flexible bonds and seals**
- ▶ **High modulus of elasticity**, high resistance to traffic
- ▶ **High sucker effect** for bonding on vertical surfaces and ceilings
- ▶ **Paintable**
- ▶ **High bond strength**, no primer required
- ▶ **Compatible with all absorbent mineral substrates, metal surfaces, varnished surfaces, wood, stone, brickwork and glass**
- ▶ Available in **white, grey (111), grey (113) and black (120)** (300 ml); **grey (111) and black (120)** (600 ml)
- ▶ Ideal for **sealing civil and industrial floors** and **flexible bonding** of construction features instead of using screws, nails and lightweight fittings



Mapeflex PU30

- ▶ **Two-component**, thixotropic epoxy-polyurethane **sealant**
- ▶ **High modulus of elasticity**, high strength
- ▶ **High chemical resistance**
- ▶ Thixotropic consistency **for application on vertical surfaces**
- ▶ **Pre-dosed two-component product**
- ▶ Available in **grey (113)**
- ▶ Ideal for **vertical and horizontal joints** in car-parks, garages, commercial areas, warehouses and production areas



Mapeflex PU21

- ▶ **Two-component**, thixotropic epoxy-polyurethane **sealant**
- ▶ **High modulus of elasticity**, high strength
- ▶ **High surface hardness**, good resistance to vehicle traffic
- ▶ **Good chemical resistance**
- ▶ **High flow**, quick and easy application on floors
- ▶ Available in **grey (113)**
- ▶ Ideal for **internal joints** in covered car-parks, supermarkets, warehouses and store rooms



Kerapoxy CQ

The high-performance, **multifunctional**, **easy-to-use** epoxy grout with a **bacteriostatic** agent



Easy-to-use, anti-acid, easy-to-clean, with a **bacteriostatic agent** and **BioBlock® technology**, two-component **epoxy filler**, ideal for grouting the joints of ceramic tiles and mosaics.

- **With a bacteriostatic agent and Mapei BioBlock® technology:** this grout avoids the formation of micro-organisms and moulds on the joints' surface, making the tiled surfaces hygienic and healthy, as certified by the University of Modena (Italy) according to **ISO 22196:2007** standard.
- **The BioBlock® technology** blocks the formation and growth of micro-organism in damp environments.

- **Emicode EC1 Plus-certified:** with very low emission level of volatile organic compounds (VOC) - Plus.
- Ideal for grouting floor joints where a high level of hygiene is required (**industrial, commercial, residential environments, swimming pools, worktops**, etc.).
- It allows the building of ceramic surfaces complying with the **HACCP** systems and meets the requirements set by **CE 852/2004** regulations concerning the hygiene of food products.



MAPEI TILE JOINTS: THE BEST CHOICE, WHATEVER THE ENVIRONMENT



What are tile joints for?

It is very important that tiles are installed with large joints between each tile, especially with large formats and tiles installed on external surfaces, for the following reasons:

Any difference in the dimensions of the tiles has less influence. This is confirmed by the maximum permitted step between tiles according to Technical Report CEN/TR13548 (*“General rules for the design and installation of ceramic tiling”*). According to this Technical Report, the maximum acceptable step between tiles is 1 mm for joints up to 6 mm wide and 2 mm for joints wider than 6 mm. It is clear, therefore, that as the width of the joint increases, any steps between tiles have less of an impact.



They considerably reduce the modulus of elasticity and, therefore, the stiffness of the tiling. While the stiffness of tiling installed by butting the tiles together is comparable to that of a stiff, seamless surface as if it were a single tile, when tiles are installed with “open” joints, each of the tiles which form the tiled surface is a single element and, within certain limits, has a certain degree of movement. This characteristic helps the tiling withstand stresses induced by the different degrees of movement between the various layers that make up the system, and provides efficient protection against the risk of tiles lifting or becoming detached from the floor. This reduces, the risk of compressive forces being generated in the tiling due to small movements in the floor or dimensional instability in the substrate, thus provoking detachment and/or cracking of the tiling.



They allow the amount of filler, or grout, in the joints to be calibrated correctly. This leads to a number of advantages, such as the durability of the grout and its aesthetic, mechanical and functional characteristics.



For these and many other reasons, installing tiles with a wide joint is a requirement of numerous international standards.

Tile joints: the detail that makes all the difference!



*Figs. 1_2 - Test to measure abrasion resistance
Fig. 3 - Verifying the stability of a sample of cementitious grout*

International standards

Up until the 1990's, the situation of international standards covering products for the installation of ceramic tiles and natural stone were extremely complicated and non-uniform. Each European and non-European country had its own set of standards issued by national institutes representing each country. This situation obviously posed serious problems for companies with a vocation for international commerce, such as Mapei. Certifying each product in different countries represented a considerable cost for such companies, and dedicated research teams were required to reproduce the various national test conditions required in our laboratories. Also, there were so many contradictions between the various standards that it would have been necessary to adapt the formulations and products in order to satisfy the minimum requirements for each single country. And what is more, at the beginning of the 1980's, many national standards were obsolete and no longer relevant to the latest application techniques and the new types of covering materials which were taking a foothold during that period. In order to address this situation, in 1989 CEN, the European Standards Committee, formed a dedicated technical group with the aim of developing a series of standards for tiling adhesives and grouts. Mapei has always taken an extremely proactive and propositional position within this group over the years, taking on the role of Chairman. Up until now the technical group has met a total of 44 times, and in 2001 issued Euronorm EN 12004 regarding the specifications and requirements for tiling adhesives, and in 2002 Euronorm EN 13888 which establishes the specifications and requirements for grouts. Revisions of these standards were published in 2007 and 2009. The European approach was used as a model to create a group within the ISO (International Standard Organisation) 189 committee, dedicated to the standardisation of ceramic tiles. Mapei also played a key role in this activity, with the manager of Mapei Corporation Research & Development, acting

as group coordinator. In this case, the group has published the ISO 13007 standard which is divided into 4 parts:

ISO 13007 – 1:

terms, definitions and specifications for adhesives

ISO 13007 – 2:

test methods to determine the characteristics of adhesives

ISO 13007 – 3:

terms, definitions and specifications for grouts

ISO 13007 – 4:

test methods to establish the properties of grouts

ISO 13007 - 1 and ISO 13007 - 3 were published in December 2004, while ISO 13007 – 2 and ISO 13007 – 4 were published in September 2005. The ISO standards were then approved and published by various national institutes.

The advantages deriving from using products on site which comply with ISO standards are obvious and immediate. Firstly, the classifications defined by the standards offer a clear identification of the properties of products so they may then be selected according to their specific application and prevent them being replaced by other products with inferior characteristics. Also, the practice of classifying products has undoubtedly led to more transparency regarding the quality of products available on the market.

Classification requirements and their relative testing methods were chosen using simplicity and repeatability as their main criteria. They must also represent characteristics which really reflect the most critical application aspects of the product.



Fig. 4 - Test to measure the flexural strength of a sample of cementitious grout
 Fig. 5 - Water absorption test

Cementitious grouts

EN 13888

Cementitious grouts in this standard are defined as CG and are divided into two main classes, CG1 and CG2. These are the normal and improved classes respectively, and are followed by special classes: A for products with high abrasion resistance and W for products with low water absorption. A typical class CG1 grout may be considered sufficient for installing ceramic or porcelain tiling not subject to excessive variations in temperature and humidity in residential and commercial environments. For areas subject to prolonged periods of high humidity and thermal shock or intense traffic, on the other hand, conditions typically found in high-intensity commercial and industrial environments, a class CG2 grout is recommended. Even though the standard does not distinguish between normal-setting and rapid-setting grout, it is recommended to use the latter type when surfaces need to be put back into service quickly, for example in retail, airports, public areas, swimming pools, etc.

Class A is required when the area is subject to intense foot or trolley traffic when in service such as in supermarkets, or if there is a continuous flow of water, typical of fountains. W class products, on the other hand, are recommended when the installation is subjected to continuous immersion in water, such as tiling in fountains and swimming pools. In the test carried out as prescribed in the standard (Figures 1 and 2), a 10 x 10 cm sample of the product is subjected to a continuous, constant flow of spheres of abrasive material. At the end of the test, the loss in weight is measured. To measure the risk of cracking due to hygrometric shrinkage in the product, the test prescribed in the standard (Figure 3) measures the amount of movement in a 4 x 1 x 16 cm test sample cured for 28 days. A product with adequate dimensional stability (that is,

very little hygrometric shrinkage) may also be used to tile surfaces where the width of the joints varies. Testing is carried out after 28 days and include compressive and flexural strength tests, which are carried out on samples measuring 4 x 4 x 16 cm (Figure 4).

Appropriate products may even be employed without any particular problem for tiled surfaces subject to particularly heavy traffic. Excessive water absorption by the grout may have a disastrous effect on the entire tiled surface if it is subjected to constant immersion in water and tiles become detached. The standard prescribes a test in which the amount of water a product absorbs is estimated by measuring capillary lift. Samples are cured for 28 days, partially immersed in water and their increase in weight is measured after being immersed for 30 minutes and 4 hours (Figure 5). Products with low water absorption may be successfully used even in critical situations, such as mosaic tiles in swimming pools.

Grouts made by Mapei, such as **Keracolor FF** for joints up to 6 mm wide, **Keracolor GG** for joints from 4 to 15 mm wide and **Ultracolor Plus** for joints from 2 to 20 mm wide, are all part of the improved class of grouts CG2WA and, as such, are guaranteed when used in particularly critical site conditions, such as those described above. **Ultracolor Plus** is also a fast setting grout, ideal for applications which need to be put back into service quickly with a approximate set to foot traffic time of 3 hours.

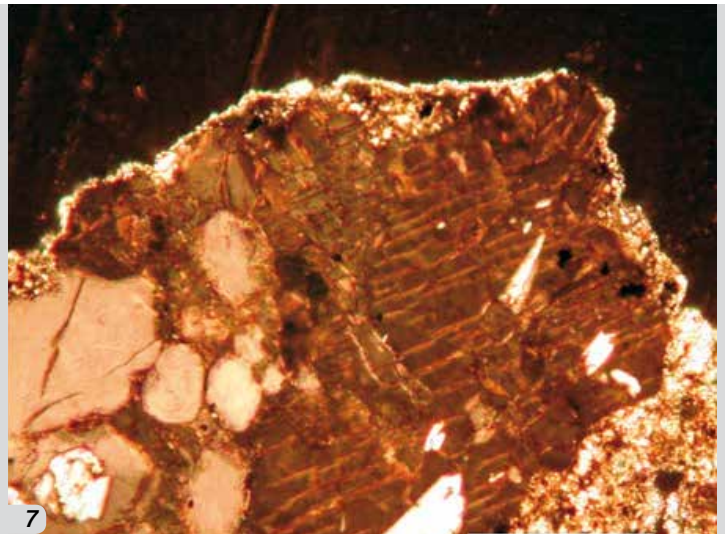


Fig. 6 - The surface of cementitious grout with efflorescence

Fig. 7 - A thin section of cementitious grout with efflorescence viewed through a microscope



DROPEFFECT®

Amongst the added characteristics of Mapei grouts, which are not covered by current standards and which guarantee that they are colour-fast and easy to clean, there is the so-called DropEffect® technology which allows grouted joints to be created which are particularly water repellent. Thanks to this technology, liquids deposited on the surface are not absorbed but remain on the surface in the form of droplets, so joints are much easier to clean.



BIOBLOCK®

In damp environments, BioBlock® technology inhibits the formation and proliferation of various types of mould on the surface of grouted joints, which not only cause an unsightly finish, but also has a negative effect on pollution levels in internal environments and inevitable consequences on the health of final users.

ANTI-EFFLORESCENCE

Ultracolor Plus also has characteristics which guarantee against the formation of efflorescence, one of the most unsightly defects on ceramic tiling, which forms on both internal and external façades. *Figure 6* shows the surface of a product with efflorescence. The classic white streaks are typical of formulas based on the use of Portland cement as a binder. If a thin section of the joint is analysed through a microscope, the type of chemical which forms the efflorescence may be identified on the surface of the product due to the reaction between carbon dioxide contained in the atmosphere and calcium hydroxide produced by hydration of

the cement, represented by the thin white superficial line (*Figure 7*). Further experimental support into the morphologic and chemical study of the efflorescence may be made using an electronic scansion microscope, an instrument which can produce highly magnified images (up to 800,000x magnification) of the surface of the product and assess the exact chemical composition of the surface. *Figure 8* shows the images taken using this technique, which are then used to observe how the efflorescence is made up of numerous groups of flat crystals which, upon analysis, are formed by calcium carbonate. The binder in **Ultracolor Plus** does not contain Portland cement, that is, the source of carbonate, which makes the product completely immune from the formation of efflorescence.

Ultracolor Plus is an ideal product for colour stability.

The aesthetic stability guaranteed by this product obviously does not compromise the characteristics described in the standards, as confirmed by its CG2WA classification status.

Overall, **Ultracolor Plus** is a grout which offers the highest performance on site, prevents problems due to mechanical and thermal stresses, anti-aesthetic effects due to instability of the colour and is nowadays a product with unique characteristics which has no rival on the market.



Fig. 8 - Tile joint with efflorescence viewed through an electron microscope



Fig. 9 - Accelerated ageing test using a weatherometer
Figs. 10_11 - Verifying colour with a spectrophotometer

Epoxy grouts

EN 13888

From a standards point of view the issue related to epoxy grouts is relatively simple since the standard specifies only one class (RG), and all epoxy grouting mortars which meet the minimum requirements are in this class.

Specifications for reactive sealants

Main characteristics		
Characteristic	Requirement	Test method
Resistance to abrasion	$\leq 250 \text{ mm}^3$	EN 12808-2
Flexural strength after dry storage	$\leq 30 \text{ N/mm}^2$	EN 12808-3
Compressive strength after dry storage	$\leq 45 \text{ N/mm}^2$	EN 12808-3
Shrinkage	$\leq 1.5 \text{ mm/m}$	EN 12808-4
Water absorption after 240 mins.	$\leq 0.1 \text{ g}$	EN 12808-5

Because the values are so high, Euronorm EN 13888 does not have any other sub-classes.

All Mapei epoxy grouts are classified RG because they meet all the aforementioned requirements.

Epoxy grouts are normally used when particularly hygienic surfaces are required, or if there are particular strength or chemical resistance requirements.

They are particularly suitable, in industrial environments and in the residential sector in areas such as bathrooms, kitchens, laundry rooms, etc. where total cleanability of the joints is important.

The use of Mapei epoxy grouts allows floors, walls, worktops, etc. to comply with the HACCP system and the requirements of EC Regulation No. 852/2004 regarding the hygiene of foodstuffs.

Colour

There are no national or international standards which cover this issue related to the aspect of the grout, even if it is one of the main characteristics to take into consideration to meet a client's requirements.

Mapei grouts (cementitious and epoxy) are available in a wide variety of colours (more than 50) if we consider the various colour ranges to satisfy even the most demanding client. And if we also consider the addition of **MapeGlitter** coloured metallic glitter, available in 22 different colours, to **Kerapoxy Design** (two-component, anti-acid, translucent, decorative epoxy mortar for grouting glass mosaic, ceramic tiles and stone with a highly attractive finish), the number of possible colour combinations are even higher.

The durability and uniformity in colour of Mapei grouts is guaranteed by their special formulation and the use of pigments which remain stable if subjected to UV rays or other atmospheric phenomena. All our products undergo accelerated ageing tests using a weatherometer (Figure 9-10), a very useful instrument used to assess the reaction of products exposed to various weather cycles, such as sunlight, rain (including acid rain) and temperature variations.

Before being marketed, all Mapei grouts are subjected to rigorous quality control tests in compliance with the ISO 9001 system, certification awarded to the company in 1994. A special instrument called spectrophotometer is used to check the colour of cementitious and epoxy grouts before they are put on sale to make sure they comply with Mapei quality standards and that every production batch is the same (Figures 11 and 12).



Fig. 12 - Environmental simulation chambers available at the Mapei R&D laboratory
Figs. 13_14 - Test to measure VOC emissions

Emissions

VOC what are they?

We are all aware about the dangers from environmental pollution, and we all know the damage that benzene from cars can do to our wellbeing.

There is also another type of pollution around us called "INDOOR POLLUTION". In fact, the quality of the air around us is heavily influenced by all the volatile organic compounds (VOC) emitted from furniture, adhesives and paint. We have all at sometime perceived a strong odour after applying a product, assembling a piece of furniture or painting the walls in our home. We have all had to open the windows in an effort to get rid of a strange smell. Or just cleaning the floors in our home, we sometimes smell strong odours which may irritate us. All these odours are due to the volatility of certain compounds contained in the wood used to make furniture, in varnishes and in detergents: these compounds are named VOC (Volatile Organic Compounds).

Sometimes it isn't possible to detect VOC's, sometimes they may have no effect on people's health or sometimes they may be harmful. VOC's may even be cancerogeneous, such as benzene given off by cars.

How do VOC influence our day to day life in our homes?

We spend around 90% of our time in closed environments: the home, the work, the school, the cinema,...

It is widely known that most volatile organic compounds can be irritating for our mucous membranes; many of them have a highly concentrated neuro-toxic action (benzene, toluene, cyclohexane, styrene and chlorines), while others are thought or known to cause cancer (formaldehyde and benzene).

Certain types of furniture are "famous" for their emission of formaldehyde, while pine wood releases certain substances which have a pleasant smell, but may also be irritating.

This is why it is so important to guarantee good quality air in the buildings we use by modifying our behaviour and using products which emit the lowest possible amount of volatile organic compounds.

Mapei's engagement

For more than 10 years, Mapei's R&D analysis laboratory has been assessing the eco-sustainability of Mapei products using techniques prescribed by current standards and instruments which only the best-equipped laboratories have access to.

There are currently twelve environmental simulation chambers in Mapei's R&D laboratories dedicated to evaluating the VOC content of products for the building industry in compliance with ISO 16000 standards (Indoor Air and EN 16561) (Figure 12).

The product to be tested is placed on a sheet of non-absorbent glass with a defined surface area, weighed and then immediately transferred into one of the environmental simulation chambers available in our laboratory (Figures 13 and 14). The ratio between the area of the sample and the volume of the chamber is very important, in that it simulates the real situation found in an apartment (floor area/room volume ratio).

The temperature and relative humidity in the chambers is tightly controlled ($T= 23^{\circ}\text{C}$ and R.H. =50%), and they are flushed with purified air. The flow of air means that the air in the chamber is completely exchanged every two hours.

After 3 and 28 days, a sample of the air in the chamber is taken using special pumps and cartridges which hold all the VOC.

The cartridges are then developed with GC/MS (gas chromatography/mass spectrometry) to obtain a type-quantitative analysis of the VOC present in the air in the chambers.

EUROPEAN LABELLING SYSTEM



GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.) Emicode



EMICODE is a voluntary system to classify products according to their VOC emissions. The EC1 and EC1 Plus marks are awarded by the GEV Institute (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte

e.V.), an association which checks the emission levels of products used for floors, adhesives and various materials used in the building industry, and of which MAPEI is a member. First of all, a product classified EC1 Plus or EC1 must contain no solvents and is not labelled as being toxic.

With an environmental simulation chamber, the emission of volatile organic compounds is measured after 3 and 28 days: this parameter is called TVOC (Total Volatile Organic Compounds). It is expressed in $\mu\text{g}/\text{m}^3$ and is the sum of the concentrations of all the volatile compounds. After 3 days the level of cancerogeneous compounds must also be measured, such as benzene (limit = $2 \mu\text{g}/\text{m}^3$), formaldehyde (limit = $50 \mu\text{g}/\text{m}^3$) and any other residual monomers. After 28 days, on the other hand, the level of semi-volatile compounds is also measured, and then all the concentrations are added together: this parameter is called TSVOC (Total Semi-Volatile Organic Compounds). Semi-volatile compounds are all those substances with a high boiling point, such as certain types of plasticiser, which remain in the environment for a long time and which decrease very slowly. Even though almost all these substances are neither toxic nor harmful to a person's health, it is just as important to measure their emissions, in that they have an effect on the quality of internal air for a very long time.

The following table contains the limits set by GEV to classify a product with the EMICODE label.

	$\mu\text{g}/\text{m}^3$ after 3 days TVOC	$\mu\text{g}/\text{m}^3$ after 28 days TVOC / TSVOC
EC 1 PLUS	750	60 / 40
EC 1	1000	100 / 50
EC 2	3000	300 / 100

BLAUER ENGEL

Blauer Engel differs from other rating and evaluation systems because it is not divided into different classes, but is rather a single classification: the product either complies or does not comply with Blauer Engel.

The TVOC limits, again after 3 days and 28 days, are the same as for a product with the EC1 label. Blauer Engel also "forbids" certain compounds, such as cancerogeneous compounds, certain biocides and phthalates. Just like the Emicode label, Blauer Engel is also voluntary.

M1

The M1 label, widely used in Scandinavian countries, is also voluntary and is used to evaluate VOC emissions from building products. M1 also evaluates odours and ammoniac emissions.

ÉMISSIONS DANS L'AIR INTÉRIEUR

Since September 2011 a new certification regime has been used in France for building products.

This classification system has been obligatory since 2011 for all products introduced onto the market after that date and will be extended to include all building products as of September 2013.

The "Sanitaire Logo", the name given to the label used to classify products, is based on the evaluation of emissions from a product measured in an environmental simulation chamber 28 days after application.

Limits for TVOC and for 11 organic compounds in particular have been set (formaldehyde, acetaldehyde, toluene, tetrachloroethylene, Xylene, 1,2,4-trimethylbenzene, 1,4-diclorobenzene, ethyl benzene, n-butylacetate, 2-butoxyethanol and styrene). Every product checked is then classified, from A+ (very low emissions) to C (high emissions).

LEED

In 1998, the USGBC (United States Green Building Council) introduced the first standard LEED Green Building Rating System as a guide for the design and construction of sustainable buildings. More and more architects and construction companies are requiring LEED certification as an advantage to offer their clientele. According to the USGBC, LEED (Leadership in Energy and Environmental Design) represents excellence in energy and eco-sustainable design and encourages and accelerates the adoption of building practices and eco-sustainable development on a global scale through the creation and application of performance standards which are universally shared and accepted. LEED is a voluntary system based on consent for the design, construction and management of high-performance sustainable buildings. The LEED certification system is a standard applied in more than 100 countries worldwide, including in Italy, which, thanks to the commitment of GBC ITALIA, has created a local version to indicate the requirements for constructing environmentally sustainable buildings in terms of energy and the consumption of environmental resources involved in the construction process. MAPEI develops products and systems which meet the requirements of the construction industry, by offering readily available support and all the documentation required for building companies that wish to obtain LEED certification for their projects.

Since 2009, GBC Italia has developed a LEED protocol for new builds based on the American model. Numerous countries apply protocols developed by local Green Building Councils based on the American protocol, such as Dubai, Australia, South Africa.

The new LEED V4 protocol will be introduced in October 2016 and is set to be applied all around the world.

Up until the 31st of October, it will be possible to register projects for certification and choose whether to adopt the American LEED 3 protocol – known as the 2009 – the Italian protocol or the new, more restrictive LEED V4 version. There are numerous new aspects with the new protocol.

MAPEI HELPS OBTAIN IMPORTANT CREDITS FOR EACH OF THE PROTOCOLS APPLIED.



How Mapei Products Help score LEED points

LEED certification is only applied to a complete building project, and not to the single products or services. The products themselves cannot be certified, but they can play their part in obtaining credits for LEED certification. The total number of credits obtained help earn various levels of LEED certification, with the one known as "Platinum" being the highest.

MATERIALS AND RESOURCES:

MR CREDIT 4, CONTENT OF RECYCLED MATERIALS

Constructors can contribute 1 LEED point if the content of recycled materials accounts for 10% of the total cost of the material, and 2 points if the content of recycled materials accounts for 20% of the total cost of the material. The points are only awarded if the sum of the content of recycled materials in all the materials used in the project account for at least 10% or 20% of the total value. The content of recycled materials may be from pre-consumption (waste during manufacturing, for example) or post-consumption (waste from consumers). If the content of recycled materials is from pre-consumption waste only, only half of this goes towards the credit points.

MATERIALS AND RESOURCES:

MR CREDIT 5, LOCALLY-SOURCED MATERIALS

The materials used may help earn 2 points if extracted and manufactured within a radius of 350 km from the site. The LEED standard promotes the use of locally-sourced materials, in that it reduces the impact of transport on the environment.

MAPEI Italy has 3 production facilities located in strategic positions in the north and southern-central areas and, in many cases, are able to supply products within the set distances.

LOW EMISSION MATERIALS

The Italian protocol, on the other hand, considers a low-emission material all those products which comply with GEV's EC1 or EC1 Plus classification, assessing their VOC emissions and expressing them in $\mu\text{g}/\text{m}^3$.

LEED V3

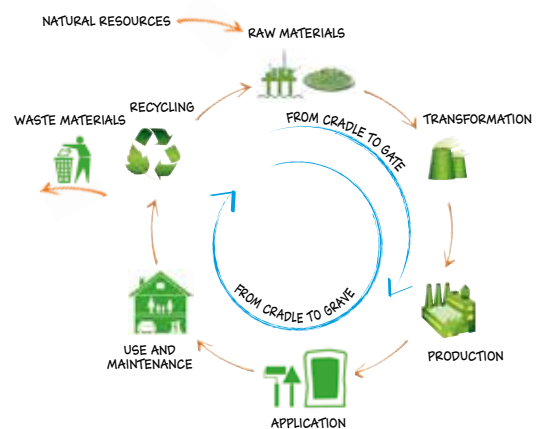
Credits for the American V3 version of the protocol to which Mapei products contribute are always MR4 (Recycled Content), MR5 (regional materials), from within a radius of 500 miles, and products with low emissions. As far as VOC are concerned, all products must comply with SCAQMD Rule 1168, which measures a product's VOC content in g/l. This method, therefore, doesn't distinguish the actual nature of the VOC, but indicates the amount of volatile organic compounds contained in the product.

LEED V4

This new protocol, which as we said previously is more restrictive than the previous versions, also introduces a number of differences in how Mapei can contribute in obtaining credits.

The old MR4 and MR5 Materials & Resources credits have been eliminated: such characteristics in a product are intrinsically included in a new MR credit MR "Building Product Disclosure and Optimization: Environmental Product Declarations". The aim of this credit is to stimulate the use of products with an EPD, thereby encouraging transparent information from the manufacturer.

But what is an EPD? EPD stands for Environmental Product Declaration, an open, clear document verified and certified by an external body that describes the impact a product has on the environment during its entire life cycle, by measuring the impact of the product using standardised LCA (Life Cycle Assessment) methods. An analysis of the life cycle of a product, therefore, is an evaluation of the environmental impact of the product during all the various phases of its life: from extraction of the raw materials that make up the formula to transport to take the raw materials to the production plant, to the production cycle, to its packaging, to waste materials, to transporting the finished product to the distributor and its final disposal, commonly known as "from cradle to grave".



Numerous environmental impacts are taken into consideration, from the more widely known Global Warming Potential (also known as its Carbon Footprint), which means the emission of greenhouse gases that contribute to global warming, up to impacts such as eutrophication (anomalous growth of aquatic organisms such as alga, which damages aquatic life), the reduction of the ozone layer, the transformation of pollutants into acidic substances (which then cause acid rain), a reduction in the amount of natural resources,...

What Mapei does is to carry out a thorough scientific analysis, using sophisticated software and dedicated databases, of all these environmental impacts during the entire life cycle of a product. An EPD for the product is then published using the so-called "Program Operator" platform, that is, bodies that certify that such declarations are correct and written according to ISO standards. Mapei uses the EPD International program operator, an internationally renowned Swedish body, and EPD Italy, founded by ICMQ.

Another modification to the new LEED V4 protocol regards low emission materials: it is no longer enough just to evaluate VOC content in g/l, as with the old American protocol; awards go to all those products which, along with this type of assessment, have also been tested in a simulation chamber to measure VOC emissions.

And Mapei, thanks to their numerous years of experience in the Indoor Air sector, is already on board and is able to supply products that fully comply with this type of credit.

MAPEI and Sustainability

Certified Quality

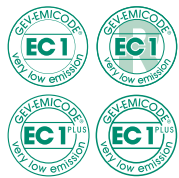


CE MARKING

All MAPEI adhesives have been awarded CE marking in compliance with Euronorm EN 12004 annex ZA, as prescribed by the current European Directive 89/106/EEC.



EMICODE EC1 PLUS EMICODE EC1 EMICODE EC1R PLUS EMICODE EC1R



All MAPEI ECO products are certified and labelled EMICODE EC1 and EMICODE EC1 PLUS "products with very low emission of volatile organic compounds" in compliance with the guidelines issued by GEV (a German body which monitors emissions from construction materials).



GREEN INNOVATION

This logo identifies MAPEI products which, thanks to their various characteristics, help in the design, construction and maintenance of eco-sustainable buildings.



LEED

LEED is a voluntary system for the design, construction and management of high-performance, sustainable buildings. The LEED certification system indicates the requirements for constructing environmentally sustainable buildings in terms of energy and the consumption of natural resources involved in the construction process. The LEED protocol was created in the USA, and is currently applied in more than 100 countries.



EPD

Maapei was awarded Certiquality certification in 2016 for their EPD (Environmental Product Declaration) issuing process. An EPD describes the environmental impact of a product throughout its entire life cycle by measuring its impact using standardised LCA (Life Cycle Assessment) methods.



BLAUER ENGEL

Blauer Engel differs from other rating and evaluation systems because it is not divided into different classes, but is rather a single classification: the product either complies or does not comply with Blaue Engel.



EN 12004

EN 13888

ISO 13007-1

ISO 13007-3



All MAPEI mortars for installing and grouting ceramic tiles and stone conform to Euronorms EN 12004 and EN 13888 and the international standards ISO 13007-1 and 13007-3.



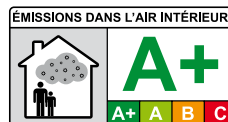
BIOBLOCK

This MAPEI technology impedes the formation and proliferation of various types of mould in damp conditions, and helps create a more hygienic, healthy environment for final users.



DROPEFFECT

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



LOGO SANITAIRE -

Émissions dans l'air intérieur

The sanitaire logo is obligatory in France, and must be applied on all construction products for internal use sold from the 1st of January 2012 (and from 1/9/2013 for products on the market prior to this date). It is similar to the energy efficiency label applied on household appliances, and indicates the class of the product (A+ is the highest and C is the lowest) regarding the emission of volatile organic compounds (VOC). Ref. French Decree n° 2011-321 and successive annexes, with the aim of reducing emissions in buildings to safeguard the quality of indoor air and, as a result, the health of final users.

* Information sur le niveau d'émission de substances volatiles dans l'air intérieur présentant un risque de toxicité par inhalation, sur une échelle de classe allant de A+ (très faibles émissions) à C (fortes émissions)



M1 FINLAND

This mark, widely known in Scandinavian countries in particular, is a voluntary label which assesses both the level of VOC emissions and odours from products.

CERTIFICATION OF GROUTS AND FLEXIBLE JOINTS

								  CREDITS
GROUTS	FIX & GROUT BRICK	EN 12004	D2T				●	2
	FLEXCOLOR					●	●	2
	KERACOLOR FF			CG2WA	EC1 R PLUS	●		3
	KERACOLOR GG			CG2WA	EC1 R PLUS			3
	KERACOLOR PPN			CG2WA				2
	KERACOLOR SF			CG2WA	EC1 R PLUS			3
	KERAPOXY	EN 12004	R2T	RG	EC1 R PLUS			3
	KERAPOXY CQ	EN 12004	R2	RG	EC1 R PLUS		●	3
	KERAPOXY DESIGN	EN 12004	R2	RG	EC1 R PLUS			3
	KERAPOXY IEG			RG	EC1 R PLUS			3
	KERAPOXY P			RG				2
	ULTRACOLOR PLUS			CG2WA	EC1 PLUS	●	●	3
FLEXIBLE JOINTS	MAPEFLEX PU20							1
	MAPEFLEX PU30	EN 15651						1
	MAPEFLEX PU40	EN 15651			EC1 R			3
	MAPEFLEX PU 45 FT	EN 15651			EC1 R			3
	MAPEFLEX PU50 SL	EN 15651						2
	MAPESIL AC	EN 15651			EC1 PLUS		●	3
	MAPESIL LM	EN 15651			EC1 PLUS		●	3

Apart from meeting the requirements of national standards, the fillers for tile joints and elastic joints also comply with certification applied locally in the various countries.

SELECTION CHART

		TYPE OF COATING MATERIAL						WHERE TO USE												
		Mosaic	Cotto	Ceramic tiles	Stone materials	Decorative elements in lightweight cementitious conglomerate	Porphyry and rough-cut stone	Residential environments	Bathrooms and kitchens	Balconies and terraces	Swimming pools	Saunas and Turkish baths	Supermarkets	Public buildings	Façade coatings	Foodstuffs industries	Meat factories and oil mills	Footpaths and courtyards	Roads and squares with limited traffic	Roads and squares for vehicles
CEMENTITIOUS GROUTS	ULTRACOLOR PLUS (joints from 2 to 20 mm)	■	■	●	●			●	●	●	●	●	●	●	●	■				
	KERACOLOR SF (joints up to 4 mm)	■		■	■			■	■	■*	■*	■*								
	KERACOLOR FF (joints up to 6 mm)	■		■	■			■	■	■*	■*	■*								
	KERACOLOR GG (joints from 4 to 15 mm)		■	■	■			■	■	■*	■*	■*	■●*	■●*	■*	■				
EPOXY GROUTS	KERAPOXY (joints of at least 3 mm)	■		■	■			■	●	■	●	●	■	■		●				
	KERAPOXY DESIGN (joints from 2 to 7 mm)	●		■	■			■	●	■	●	●	■	●						
	KERAPOXY P (joints of at least 3 mm)			■	■					■		●	●		●					
	KERAPOXY CQ (joints of at least 3 mm)	■		■	■			■	■	■	■	●	●		●					
	KERAPOXY IEG (joints of at least 3 mm)			■	■										■	●				
READY-TO-USE PASTE PRODUCT	FLEXCOLOR	■		■										●						
	FIX & GROUT BRICK					●		■							■					
PRODUCT FOR ARCHITECTONIC STONE FLOORING	KERACOLOR PPN						●						■				●	●	●	
	MAPESTONE PFS 2						●						●				●	●	●	
	MAPESTONE PFS PCC 2						●						●				●	●	●	
FLEXIBLE JOINTS	MAPESIL AC	●	■	●			●	●	■	●	●		■							
	MAPESIL LM	■	●	■	●	■	●	■	■	●			■	●			■			
	MAPEFLEX PU21			■		■						■	■		■	■				
	MAPEFLEX PU20			■		■						●	●		●	●				
	MAPEFLEX PU30					■						■	■		■	■				
	MAPEFLEX PU40			■	■	■	■	■	■					■						
	MAPEFLEX PU 45 FT			■	■	■	■	■	■			■	■	■			■	■	■	
	MAPEFLEX PU50SL			■	■	●	■	■	■								●	●	●	

N.B. always carry out preliminary tests before grouting stone or porcelain with a porous or rough surface.

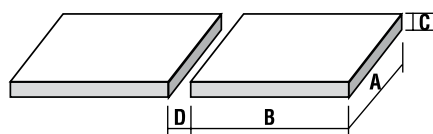
■ = fit for use

● = particularly recommended by Mapei

* = with FUGOLASTIC

CONSUMPTION TABLE

Tile size (mm)	Joint (mm)	Ultracolor Plus kg/m ²	Keracolor SF kg/m ²	Keracolor FF kg/m ²	Keracolor GG kg/m ²	Kerapoxy Design Kerapoxy P Kerapoxy CQ kg/m ²	Kerapoxy IEG kg/m ²	Flexcolor
75x150x6	2	0,4	0,4	0,4		0,4		0,4
100x100x7	2	0,4	0,4	0,4		0,4		0,4
100x100x9	2	0,6	0,5	0,5		0,6		0,6
150x150x6	2	0,3	0,2	0,2		0,3		0,3
200x200x7	2	0,2	0,2	0,2		0,2		0,2
200x200x9	2	0,3	0,3	0,3		0,3		0,3
300x300x10	3	0,3	0,3	0,3		0,3	0,3	0,3
300x300x20	3	0,6	0,6	0,6		0,6	0,6	0,6
300x600x10	3	0,2	0,2	0,2		0,2	0,2	0,2
400x400x10	3	0,2	0,2	0,2		0,2	0,2	0,2
500x500x10	5	0,3		0,3	0,3	0,3	0,3	0,3
600x600x10	5	0,3		0,3	0,3	0,3	0,2	0,3
750x750x10	5	0,2		0,2	0,2	0,2	0,2	0,2
100x600x9	5	0,8		0,8	0,8	0,8	0,7	0,8
150x600x9	5	0,6		0,6	0,6	0,6	0,5	0,6
150x900x9	5	0,6		0,5	0,6	0,6	0,5	0,6
150x1200x10	5	0,6		0,6	0,6	0,6	0,5	0,6
225x450x9	5	0,5		0,5	0,5	0,5	0,4	0,5
225x900x9	5	0,4		0,4	0,4	0,4	0,4	0,4
250x900x9	5	0,4		0,3	0,4	0,4	0,3	0,4
250x1200x10	5	0,4		0,4	0,4	0,4	0,3	0,4
600x600x5	5	0,1		0,1	0,1	0,1	0,1	0,1
600x600x3	5	0,1		0,1	0,1	0,1	0,1	0,1
1000x500x5	8	0,2			0,2	0,2	0,2	0,2
1000x500x3	8	0,1			0,1	0,1	0,1	0,1
1000x1000x5	10	0,2			0,2	0,2	0,1	0,2
1000x1000x3	10	0,1			0,1	0,1	0,1	0,1
3000x1000x5	10	0,1			0,1	0,1	0,1	0,1
3000x1000x3	10	0,1			0,1	0,1	0,1	0,1



$$\frac{A+B}{A \times B} \times C \times D \times K = \text{kg/m}^2$$

A = tile length
 B = tile width
 C = tile thickness
 D = joint width
 K = function of the mix density

} in mm

K values:

ULTRACOLOR PLUS	1.6
KERACOLOR SF	1.5
KERACOLOR FF	1.5
KERACOLOR GG	1.6
KERAPOXY	1.6
KERAPOXY P	1.6
KERAPOXY CQ	1.6
KERAPOXY IEG	1.4
KERAPOXY DESIGN	1.6
FLEXCOLOR	1.6

The sizes of the joints shown in the table are for indication purposes only. For other sizes of joint and tile please refer to the product calculator to estimate consumption rates at www.mapei.it.



COLOURING: THE CHOICE

Mapei Coloured Grouts		Ultracolor Plus	Keracolor SF	Keracolor FF	Keracolor GG	Keracolor PPN	Flexcolor	Kerapoxy	Kerapoxy CQ	Kerapoxy IEG	Kerapoxy P	Kerapoxy Design	MapeGlitter	Fix & Grout Brick	MapeSil AC	MapeSil LM
100	WHITE	●	●	●	●		●	●	●					●	●	●
799	WHITE											●				
103	MOON WHITE	●										●			●	
710	ICE WHITE											●				
700	TRANSLUCENT											●				
111	SILVER GREY	●		●	●		●	●	●			●			●	●
110	MANHATTAN 2000	●		●	●			●				●			●	●
112	MEDIUM GREY	●		●	●			●				●			●	●
282	BARDIGLIO GREY								●							
720	PEARL GREY											●				
728	DARK GREY											●				
113	CEMENT GREY	●		●	●	●		●	●	●	●	●		●	●	●
115	RIVER GREY <small>new</small>	●										●			●	
116	MUSK GREY <small>new</small>	●										●			●	
174	TORNADO	●										●			●	
119	LONDON GREY <small>new</small>	●										●			●	
114	ANTHRACITE	●		○	○			○	○			○			○	○
120	BLACK	○						○	○			○			○	○
137	CARIBBEAN <small>new</small>	●										●			●	
130	JASMINE	●		●	●			●	●	●		●			●	●
290	CREAM								●							
131	VANILLA	●		●	●			●				●			●	
138	ALMOND <small>new</small>	●										●			●	
729	SAHARA YELLOW											●				
132	BEIGE 2000	●		●	●		●	●	●			●		●	●	●
133	SAND	●										●			●	
134	SILK	●										●			●	
139	PINK POWDER <small>new</small>	●										●			●	
141	CARAMEL	●		●	●			●				●			●	
135	GOLDEN DUST	●										●			●	
152	LIQUORICE <small>new</small>	●										●			●	
142	BROWN	●		●	●			●				●			●	
147	CAPPUCCINO								○						○	
136	MUD	○										○			○	
144	CHOCOLATE	○		○	○			○				○			○	
146	RICH BROWN								○			○			○	
149	VOLCANO SAND	○										○			○	
145	TERRA DI SIENA	●		●	●			●				●			●	
143	TERRACOTTA	○						○				○			○	
172	SPACE BLUE	○										○			○	
170	CROCUS BLUE	●		●	●			●	●			●			●	
162	VIOLET	●						●	●			●			●	
171	TURQUOISE	○						○				○			○	
173	OCEAN BLUE								○			○			○	
283	SEA BLU								○			○			○	
182	TORMALINE								●			●			●	
183	LIME GREEN								●			●			●	
150	YELLOW	●						●				●			●	
151	MUSTARD YELLOW								●			●			●	
165	CHERRY RED								○			○			○	
999	TRANSPARENT														●	●
	LIGHT GOLD														●	●
	SILVER														●	●

Mapei Coloured Grouts

Beauty which resists everything.



EASY TO CLEAN



MOULD-RESISTANT



DURABLE AND STRONG



WIDE RANGE OF COLOURS

A range of high-quality, highly-functional products rich in colour for internal and external use. Solvent-free, with very low emission level of volatile organic compounds (VOC) and certified in compliance with the most strict international standards. Suitable for all types and formats of floors and walls: ceramic tiles, terracotta, stone material, mosaics and metal. Available as cementitious, grouting paste and epoxy grout. **Mapei Coloured Grouts.** The choice that completes every project. From Mapei, world leader in the production of grouts and adhesives.

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Due to the printing processes involved, the colours should be taken as merely indicative of the shades of the actual products.



● Technical documentation

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

HEADQUARTERS

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