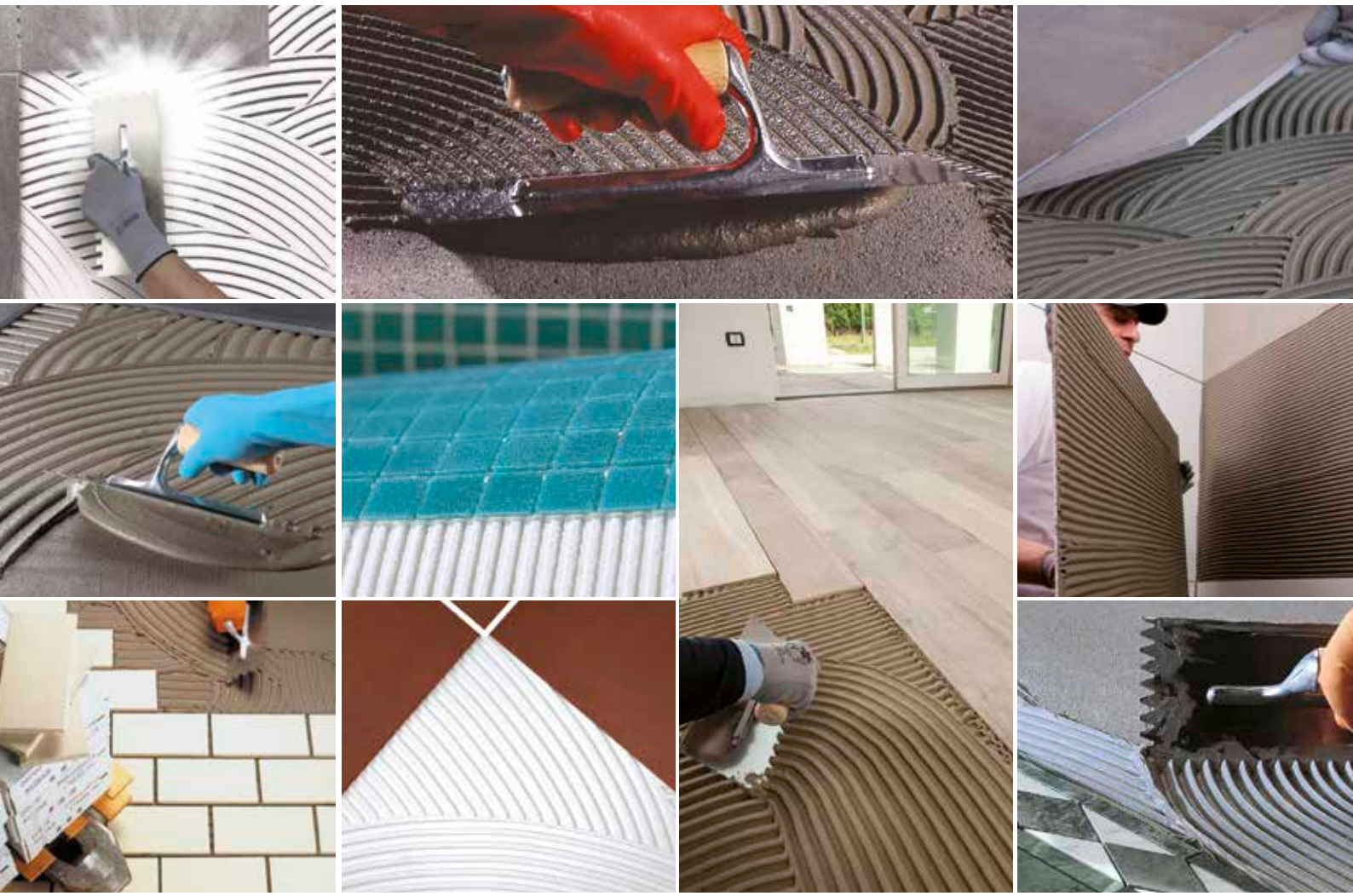
SELECTION CHART OF ADHESIVES FOR CERAMIC TILES AND STONE MATERIAL



www.mapei.com.au

MAPEI®

ADHESIVES · SEALANTS · CHEMICAL PRODUCTS FOR BUILDING

Showroom Fisar
Milano – Italia

La Llotja de Palma, an ancient building in
Palma di Maiorca - Spagna

Emil Frey car show-room
Basel - Switzerland

CERAMIC TILES AND STONE MATERIAL LINE

Ceramic tiles, natural stone and recomposed materials are generally used for floors and coatings in residential, commercial and industrial constructions and in airports, swimming pools, etc.

In recent years, the development of new technology for the production of ceramic tiles has led to new, thinner and larger sized tiles being available on the market, which are used to create almost continuous surfaces with extremely high architectural value.

Also, the increasing demand to improve soundproofing and thermal insulation in buildings, means that tiles must now be laid on substrates with different characteristics than those normally used.

We must also stress how our awareness of the quality of the air and surroundings in our homes and in the workplace has developed in recent years.

MAPEI research has undertaken the challenge to address these demands, and has developed products with increasingly sophisticated formulations which are easy to use and apply, guarantee the durability of ceramic and stone flooring and coatings and respect the environment and the health of floor layers, and all those who use the environments in which they have been applied.

MAPEI can now boast a complete range of products adapted to all installation systems, on any scale. The range includes cementitious adhesives, paste adhesives, hydraulic binders for screeds, primers, levelling compounds, grouts, sealants and ancillary products suitable for applications until recently considered technically impossible but that now open up a number of exciting new possibilities:

- repair work without costly demolition;
- increased speed and efficiency in the execution of work. As a result, work is completed more rapidly;
- progressive elimination of dangerous products from construction sites;
- grouts and joints that are not only functional, but may also serve as decorative features;
- systems for the installation of ceramic tiles on façades on layers of thermal insulation (**Mapetherm Tile System**).

IN COMPLIANCE WITH INTERNATIONAL STANDARDS
ISO 13007
MAPEI
ADHESIVES FOR CERAMIC TILES

All MAPEI adhesives for ceramics and stone material conform to Standard ISO 13007-1

CE
EN 12004

All MAPEI adhesives have been awarded the CE mark in compliance with Annex ZA, Standard EN 12004

HOW TO CHOOSE THE RIGHT ADHESIVE?

When installing ceramic tiles, the adhesive is used to create a strong, durable bond between the tiles and the tiling substrate. To choose the most suitable adhesive, the specific requirements of each project (the area where the tiles are installed, service conditions when in use, type of substrate, dimensions of the tiles, etc.) and any installation constraints (installation schedule, installation technique, etc.) must all be taken into consideration. MAPEI proposes a vast range of adhesives which are classified according to EN 12004 or ISO13007-1 Standards, based on the following criteria:

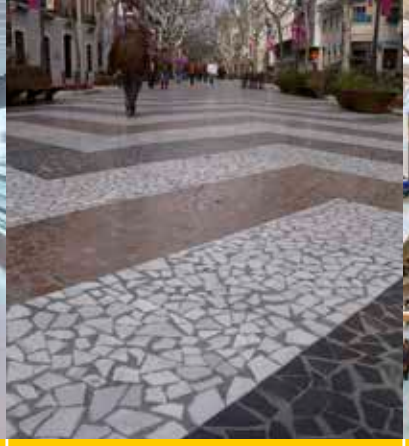
- **Chemical composition**:
  - Cementitious (**C**), adhesives made from a mixture of hydraulic binders, aggregates and chemical additives. They may be either a one-component type, which means they just need to be blended with water, or a two-component type, which means they are blended with water and/or latex
  - Dispersion (**D**), a mixture of organic binders dispersed in water polymers with organic additives
  - Reactive (**R**), a mixture of synthetic resins which harden through a chemical reaction (components A and B)

- **Adhesion capacity**:
  - **Class 1**: Normal adhesives;
  - **Class 2**: Improved adhesives;

- **Optional classes**:
  - **Class F**: Fast-setting adhesives;
  - **Class T**: Reduced slip adhesives;
  - **Class E**: Adhesives with extended open time;
  - **Class S1**: deformable adhesives (for cementitious adhesives only);
  - **Class S2**: highly deformable adhesives (for cementitious adhesives only)

Apart from the main guidelines explaining how to use the product correctly, the packaging for each MAPEI product also indicates the relative certification of the product and its main technical characteristics. For all information regarding the technical characteristics of MAPEI products and instructions on how to use them correctly, refer to the specifications contained in each product's relative Technical Data Sheet, available for viewing or download at the company' official website *www.mapei.com.*

Melbourne International Airport - Australia



Passeig Germanies Valencia - Spain

Shopping centre Il Centro Arese - Italia

THE ENVIRONMENT AND MAPEI RESEARCH

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. 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 Compunds).
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 16516).

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. 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°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.

Environmental simulation chambers available at the Mapei R&D laboratory

Test to measure VOC emissions

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 µg/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 µg/m^3), formaldehyde (limit = 50 µg/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.

	µg/m^3 after 3 days TVOC	µg/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 it.
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

* 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)

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 October 2016, 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 $\mu g/m^3$.

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.

Ü MARK - GERMAN DIBt
The U mark label is also obligatory in Germany for all construction materials for flooring, and is based on a material's VOC emissions.

EPD
Mapei 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.

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

ULTRALITE
Lightweight products.

LOW DUST
Low Dust technology has also been developed to safeguard the health of those who handle and apply such products, the amount of dust produced during the mixing phase with water is drastically reduced. Products which feature this technology are easily recognised by the **Low Dust** logo.

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.

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.

Certified carbon footprint (ISO TS 14067).
No residual greenhouse gas emissions through certified offsetting.

The World of Mapei

Mapei offers a wide range of high quality products for installing ceramic tiles, stone and mosaics, carpet, vinyl, rubber and timber flooring.

- Floor preparation
- Ceramic Adhesives
- Sealants
- Waterproofing
- Grouts
- Timber & Flooring Adhesives
- Repair Mortar
- Construction Grouts

- Products that are easy to use, labour efficient and cost effective
- Eco-sustainable products with extremely low VOC emissions that exceed the requirements set out by the Green Council of Australia and **Green Star™**
- Internationally and locally certified products according to the strictest testing standards

For more information visit **www.mapei.com.au**

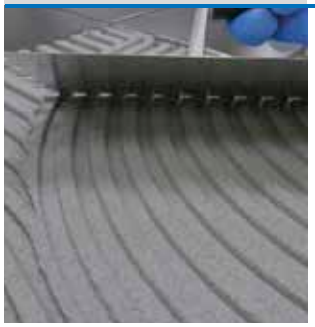
CERTIFICATIONS

	ISO 13007	GREEN INNOVATION	GBCA GreenStar™	Fast Track Ready
NORMAL-SETTING HYDRAULIC BINDER-BASED ADHESIVES*				
ADEFLEX TRADE	C1 S1	•		
ADEFLEX TRADE + ISOLASTIC 50	C2 S2	•		
ADESILEX P9	C2TE	•		
KERABOND PLUS	C2T	•		
KERABOND PLUS + ISOLASTIC	C2T S2	•		
KERABOND PLUS + ISOLASTIC 50	C2T S1	•		
KERAFLEX	C2TE	•		
KERAFLEX MAXI S1	C2TE S1	•		
TIXOBOND FINE SI	C1TE S1	•		
ULTRALITE S1	C2TE S1	•		
ULTRALITE S2	C2E S2	•		
FAST-SETTING HYDRAULIC BINDER-BASED ADHESIVES*				
ADESILEX P4	C2F	•		•
GRANIRAPID	C2F S1	•		•
KERAQUICK S1	C2FT S1	•		•
KERAQUICK S1 + LATEX PLUS	C2F S2	•		•
SYNTHETIC RESIN-BASED ADHESIVES*				
MAPEMASTIC EASY	D1TE	•		
ULTRAMASTIC III	D2TE	•		
REACTIVE ADHESIVES*				
KERALASTIC T	R2T	•		
KERAPOXY ADHESIVE	R2T	•		

* Apart from international standards, the products used to install ceramic tiles also comply with the current national standards of various countries

NORMAL-SETTING HYDRAULIC BINDER-BASED ADHESIVES

Adeflex Trade



- Deformable rubber modified cement-based adhesive for bonding ceramic tiles and stone material on floor and walls in interiors. Ideal for use on rigid plywood or structural particleboard substrates if mixed with ISOLASTIC 50.

Colour: Grey
Packaging: 20kg bag
Pot Life: > 8 hours
Open Time: 20 minutes

Adesilex P9

- High-performance cementitious adhesive with no vertical slip and extended open time for ceramic tiles (thickness of adhesive up to 5 mm). Internal / external use.

Colour: Off white
Packaging: 20kg bag
Pot Life: > 8 hours
Open Time: 30 minutes

Isolastic

- Elasticising latex mixed with KERABOND PLUS. When KERABOND PLUS is mixed with ISOLASTIC they form a high-performance, highly deformable adhesive with extended open time (C2ES2).

Colour: Pinkish white
Packaging: 25kg, 6.6kg, 1kg drum

Isolastic 50

- Latex additive to elasticise cement-based adhesives. Mix with KERABOND PLUS or ADEFLEX TRADE.

Colour: White
Packaging: 25kg, 6.6kg drum

Kerabond Plus

- Cementitious adhesive with superior bond strength suitable for all tile types. Internal and external use.

Colour: Grey or white
Packaging: 20kg bag
Pot Life: > 8 hours
Open Time: approx. 20 minutes

Keraflex

- High-performance cementitious adhesive with no vertical slip and extended open time for ceramic and stone tiles (thickness of adhesive up to 5 mm). Internal / external use.

Colour: Grey or white
Packaging: 20kg bag
Pot Life: > 8 hours
Open Time: > 30 minutes

Keraflex Maxi S1

- High-performance deformable cementitious adhesive with no vertical slip, extended open time for ceramic tiles, particularly recommended for laying large porcelain and natural stone tiles (thickness of adhesive from 3 to 15 mm). Internal / external use.

Colour: Grey or white
Packaging: 20kg bag
Pot Life: > 8 hours
Open Time: > 30 minutes

Tixobond Fine S1

- High-performance, ultra-white cementitious adhesive with no vertical slip and long open time for ceramic wall and floor tiles. Internal / external use.

Colour: Super white
Packaging: 20kg bag
Pot Life: 4 hours
Open Time: 30 minutes

NORMAL-SETTING HYDRAULIC BINDER-BASED ADHESIVES

Ultralite S1

- One-component, high-performance, lightweight, deformable cementitious adhesive with no vertical slip, long open time.

Colour: Grey or white
Packaging: 13.5kg bag
Pot Life: > 8 hours
Open Time: > 30 minutes

Ultralite S2

- High-performance, highly deformable, lightweight cementitious adhesive with extended open time and very high yield. Ideal for thin porcelain tiles, ceramic and stone material.

Colour: Grey or white
Packaging: 13.5kg bag
Pot Life: > 8 hours
Open Time: > 30 minutes

FAST-SETTING HYDRAULIC BINDER-BASED ADHESIVES

Adesilex P4

- High-performance, self-buttering, quick-setting grey cementitious adhesive for ceramic tiles and stone material (thickness of adhesive from 3 to 20 mm). Internal / external use.

  N.B. May also be used for smoothing internal and external surfaces.

Colour: Grey
Packaging: 20kg bag
Pot Life: 60 minutes
Open Time: 15 minutes

Granirapid

- Two-component, high-performance, deformable, quick-setting and drying cementitious adhesive for ceramic tiles and stone material (thickness of adhesive up to 10 mm). Recommended for moisture-sensitive material.

Colour: Part A: Grey (25kg bag)
Part A: White (22.5kg bag)
Part B: Liquid (5.5kg drum)
Pot Life: 45 minutes
Open Time: 20 minutes

Keraquick S1

- High-performance, quick-setting, deformable cementitious adhesive with no vertical slip and extended open time for ceramic tiles and stone material stable in the presence of humidity (thickness of adhesive up to 10 mm).

Colour: Grey
Packaging: 20kg bag
Pot Life: 30 minutes
Open Time: 15 - 20 minutes

Latex Plus

- Elasticising latex mixed with KERAQUICK S1. When KERAQUICK S1 is mixed with LATEX PLUS it forms a high-performance, quick-setting, highly-deformable adhesive with no vertical slip (C2FS2).

Colour: White
Packaging: 10kg drum

SYNTHETIC RESIN-BASED ADHESIVES

Ultramastic III

- Ready-to-use, high-performance adhesive paste with no vertical slip and long open time, for laying ceramic tiles on walls and floors (thickness of adhesive up to 5 mm).

Colour:	White
Packaging:	5kg, 1kg buckets
Open Time:	≥ 30 minutes

Mapemastic Easy

- Ready-to-use white paste adhesive with no vertical slip and long open time for the installation of ceramic wall tiles up to 300mm x 600mm in interiors. Ideal for tiling onto gypsum board.

Colour:	White
Packaging:	20kg drum
Open Time:	30 - 40 minutes

REACTIVE ADHESIVES

Keralastic T

- Two-component, high-performance polyurethane adhesive with no vertical slip for ceramic tiles and stone material.

Colour:	White
Packaging:	10kg, 5kg buckets
Pot Life:	30 - 40 minutes
Open Time:	50 minutes

Kerapoxy Adhesive

- Two-component epoxy adhesive with reduced slip for ceramic tiles and stone material.

Colour:	Grey
Packaging:	10kg bucket
Pot Life:	45 minutes
Open Time:	60 minutes

ADHESIVES FOR INSTALLING **THIN PORCELAIN TILES** ON **INTERNAL** AND **EXTERNAL SURFACES**(1)

	RECOMMENDED ADHESIVES		
TYPE OF SUBSTRATE	FORMAT	NORMAL SETTING	FAST SETTING
Installation of thin porcelain tiles **WITH** glass fibre strengthening mesh **on internal cementitious screeds or existing ceramic flooring** and **on internal walls**	< 5000 cm² (the longer side must be no more than 100 cm)	KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC 50	GRANIRAPID
	> 5000 cm²	ULTRALITE S2 KERABOND PLUS + ISOLASTIC	KERAQUICK S1 + LATEX PLUS
Installation of thin porcelain tiles **WITHOUT** glass fibre strengthening mesh **on internal cementitious screeds or existing ceramic flooring** and **on internal walls**	< 5000 cm² (the longer side must be no more than 100 cm)	KERAFLEX KERAFLEX MAXI S1	KERAQUICK S1 GRANIRAPID
	> 5000 cm²	KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC 50	GRANIRAPID
Installation of thin porcelain tiles **WITH** or **WITHOUT** glass fibre strengthening mesh **on internal cementitious screeds with underfloor heated flooring**	< 5000 cm² (the longer side must be no more than 100 cm)	ULTRALITE S2 KERABOND PLUS + ISOLASTIC	KERAQUICK S1 + LATEX PLUS
	> 5000 cm²		
Installation of thin porcelain tiles **WITH** glass fibre strengthening mesh **on waterproofed internal surfaces (such as MAPELASTIC SMART, MAPELASTIC AQUADEFENSE** or **MAPEGUM WPS)**	< 5000 cm² (the longer side must be no more than 100 cm)	KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC 50	KERAQUICK S1 + LATEX PLUS
	> 5000 cm²	ULTRALITE S2 KERABOND PLUS + ISOLASTIC	
Installation of thin porcelain tiles **WITHOUT** glass fibre strengthening mesh **on waterproofed internal surfaces (such as MAPELASTIC SMART, MAPELASTIC AQUADEFENSE or MAPEGUM WPS)**	< 5000 cm² (the longer side must be no more than 100 cm)	KERAFLEX KERAFLEX MAXI S1	KERAQUICK S1 GRANIRAPID
	> 5000 cm²	KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC 50	GRANIRAPID
Installation of thin porcelain **WITH** or **WITHOUT** glass fibre strengthening mesh **on work benches, wooden furnishings, marine plywood and metal**	< 5000 cm² (the longer side must be no more than 100 cm)	KERALASTIC T	KERAQUICK S1 + LATEX PLUS
	> 5000 cm²		
Installation of tiles **WITH** glass fibre strengthening mesh **on façades on cementitious render or reinforced concrete**	< 5000 cm² (the longer side must be no more than 100 cm)	ULTRALITE S2 KERABOND PLUS + ISOLASTIC	
	> 5000 cm²	KERALASTIC T	
Installation of tiles **WITHOUT** glass fibre strengthening mesh **on façades on cementitious render or reinforced concrete**	< 5000 cm² (the longer side must be no more than 100 cm)	KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC 50	
	> 5000 cm²	ULTRALITE S2 KERABOND PLUS + ISOLASTIC	
MAPETHERM TILE SYSTEM, for installing thin porcelain tiles **on thermal insulation system**	< 5000 cm² (the longer side must be no more than 100 cm)		

KEY

EPOXY-POLYURETHANE adhesive

(1) for further infomation, see the Technical Notebook “Systems for installing thin porcelain tiles”.

ADHESIVES FOR INSTALLING CERAMIC TILES, MOSAICS AND STONE ON **INTERNAL FLOORS**

FLOOR	**CERAMIC, MOSAICS AND PORCELAIN**			
TYPE OF SUBSTRATE	Ceramic tiles or glass/ceramic mosaics		Porcelain tiles	
	NORMAL SETTING	FAST SETTING	NORMAL SETTING	FAST SETTING
Cementitious screeds and screeds made from special binders	KERAFLEX KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC 50	KERAQUICK S1 GRANIRAPID	KERAFLEX KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC 50	KERAQUICK S1 GRANIRAPID
Concrete floor slabs				
Heated screeds				
Existing ceramic, terrazzo or natural stone floors				
Surfaces waterproofed with MAPELASTIC AQUADEFENSE or MAPEGUM WPS				
Structural grade marine plywood or particle board	KERABOND PLUS + ISOLASTIC* ULTRALITE S2* KERALASTIC T	KERAQUICK S1 + LATEX PLUS*	KERABOND PLUS + ISOLASTIC* ULTRALITE S2* KERALASTIC T	KERAQUICK S1 + LATEX PLUS*
Existing PVC, rubber or linoleum floors	KERALASTIC T	KERAQUICK S1 + LATEX PLUS	KERALASTIC T	KERAQUICK S1 + LATEX PLUS
Metal surfaces	KERALASTIC T	KERAQUICK S1 + LATEX PLUS	KERALASTIC T	KERAQUICK S1 + LATEX PLUS

KEY

HYDRAULIC BINDER-BASED adhesive

EPOXY-POLYURETHANE adhesive

(*) apply ECO PRIM GRIP, ECO PRIM T PLUS or MAPEPRIM SP beforehand

STONE

<table>
<tr><th colspan="2">Dimensionally-stable stone (class A according to MAPEI classification system) not sensitive to staining</th><th colspan="2">Stone with poor dimensional stability (class B according to MAPEI classification system) or stone sensitive to staining</th><th>Stone with no dimensional stability (class C according to MAPEI classification system) or resin-based recomposed material sensitive to heat</th></tr>
<tr><th>NORMAL SETTING</th><th>FAST SETTING</th><th>NORMAL SETTING</th><th>FAST SETTING</th><th></th></tr>
<tr><td>KERAFLEX
KERAFLEX MAXI S1
ULTRALITE S1
ULTRALITE S2</td><td>ADESILEX P4
KERAQUICK S1
KERAQUICK S1 + LATEX PLUS
GRANIRAPID</td><td rowspan="4">KERALASTIC T
KERAPOXY ADHESIVE</td><td>KERAQUICK S1
KERAQUICK S1 + LATEX PLUS
GRANIRAPID</td><td>KERALASTIC T
KERAPOXY ADHESIVE</td></tr>
<tr><td>KERABOND PLUS + ISOLASTIC*
ULTRALITE S2*
KERALASTIC T</td><td rowspan="3">KERAQUICK S1 + LATEX PLUS*</td><td rowspan="3">KERAQUICK S1 + LATEX PLUS*</td><td rowspan="3">KERALASTIC T
KERAPOXY ADHESIVE</td></tr>
<tr><td>KERALASTIC T</td></tr>
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</table>

The installation suggestions in this table are to be considered merely for indication purposes and refer only to normal conditions. For further information, refer to the relative Technical Data Sheet for each product. Defining the most suitable installation system is highly influenced by the conditions on site and the format of the tiles to be installed. For all special cases, contact Mapei Technical Assistance Department or the relative technical guides.

ADHESIVES FOR INSTALLING CERAMIC TILES, MOSAICS AND STONE ON **INTERNAL WALLS**

WALLS	**CERAMIC, MOSAICS AND PORCELAIN**			
TYPE OF SUBSTRATE	Ceramic tiles or glass/ceramic mosaics		Porcelain tiles	
	NORMAL SETTING	FAST SETTING	NORMAL SETTING	FAST SETTING
Cementitious render, concrete or cement sheet deemed fit for purpose	MAPEMASTIC EASY KERAFLEX MAXI S1 KERAFLEX	KERAQUICK S1	KERAFLEX KERAFLEX MAXI S1 MAPEMASTIC EASY	KERAQUICK S1 GRANIRAPID
Concrete	KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 MAPEMASTIC EASY		KERAFLEX KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 MAPEMASTIC EASY	
Expanded or cellular cement blocks (with PRIMER G, ECO PRIM T PLUS or ECO PRIM GRIP)	KERAFLEX KERAFLEX MAXI S1 MAPEMASTIC EASY		KERAFLEX KERAFLEX MAXI S1 MAPEMASTIC EASY	
Lime-based skim coats or render (with PRIMER G, ECO PRIM T PLUS or ECO PRIM GRIP)	KERAFLEX KERAFLEX MAXI S1 ULTRAMASTIC III		KERAFLEX KERAFLEX MAXI S1 ULTRAMASTIC III	
Plasterboard	KERAFLEX KERAFLEX MAXI S1 MAPEMASTIC EASY		KERAFLEX KERAFLEX MAXI S1 MAPEMASTIC EASY	
Surfaces waterproofed with MAPEGUM WPS or MAPELASTIC AQUADEFENSE	KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2		KERAFLEX KERAFLEX MAXI S1 ULTRALITE S1	
Particle board	KERABOND PLUS + (*) ISOLASTIC (*) KERALASTIC T ULTRALITE S2 (*) MAPEMASTIC EASY	KERAQUICK S1 + LATEX PLUS	KERABOND PLUS + (*) ISOLASTIC (*) KERALASTIC T ULTRALITE S2 (*) MAPEMASTIC EASY	KERAQUICK S1 + LATEX PLUS
Fibre cement sheet (with PRIMER G, ECO PRIM T PLUS or ECO PRIM GRIP)	KERAFLEX KERAFLEX MAXI S1 MAPEMASTIC EASY	KERAQUICK S1	KERAFLEX KERAFLEX MAXI S1 MAPEMASTIC EASY	KERAQUICK S1 GRANIRAPID
Metal surfaces	KERALASTIC T	KERAQUICK S1 + LATEX PLUS	KERALASTIC T	KERAQUICK S1 + LATEX PLUS

KEY

HYDRAULIC BINDER-BASED adhesive

EPOXY-POLYURETHANE adhesive

READY-TO-USE adhesive DISPERSION

(*) apply ECO PRIM GRIP, ECO PRIM T PLUS or MAPEPRIM SP beforehand

STONE

<table>
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sensitive to staining</th><th>Stone with no dimensional stability (class C according to MAPEI classification system) or resin-based recomposed material sensitive to heat</th></tr>
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<tr><td>ULTRALITE S1
ULTRALITE S2
KERAFLEX
KERAFLEX MAXI S1</td><td>KERAQUICK S1
ADESILEX P4
KERAQUICK S1 + LATEX PLUS
GRANIRAPID</td><td rowspan="4">KERALASTIC T
KERAPOXY ADHESIVE</td><td>KERAQUICK S1
KERAQUICK S1 + LATEX PLUS
GRANIRAPID</td><td>KERALASTIC T
KERAPOXY ADHESIVE</td></tr>
<tr><td>KERABOND PLUS + ISOLASTIC
KERALASTIC T
ULTRALITE S2</td><td>KERAQUICK S1 + LATEX PLUS</td><td>KERAQUICK S1 + LATEX PLUS</td><td rowspan="3">KERALASTIC T
KERAPOXY ADHESIVE</td></tr>
<tr><td>KERAFLEX
KERAFLEX MAXI S1
ULTRALITE S1
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KERAQUICK S1</td></tr>
<tr><td>KERALASTIC T</td><td>KERAQUICK S1 + LATEX PLUS</td><td>KERAQUICK S1 + LATEX PLUS</td></tr>
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ADHESIVES FOR INSTALLING CERAMIC TILES, MOSAICS AND STONE ON **EXTERNAL SURFACES**

FLOOR	**CERAMIC, MOSAICS AND PORCELAIN**			
TYPE OF SUBSTRATE	Ceramic tiles or glass/ceramic mosaics		Porcelain tiles	
	NORMAL SETTING	FAST SETTING	NORMAL SETTING	FAST SETTING
Cementitious screeds and screeds made from special binders Surfaces waterproofed with MAPELASTIC SMART Concrete	KERABOND PLUS + ISOLASTIC 50 KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2	KERAQUICK S1	KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC 50	GRANIRAPID KERAQUICK S1

WALLS AND FAÇADES	**CERAMIC, MOSAICS AND PORCELAIN**			
TYPE OF SUBSTRATE	Ceramic tiles or glass/ceramic mosaics		Porcelain tiles	
	NORMAL SETTING	FAST SETTING	NORMAL SETTING	FAST SETTING
Cementitious render, concrete or cement sheet deemed fit for purpose	KERABOND PLUS + ISOLASTIC 50 KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2	KERAQUICK S1	KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC 50	KERAQUICK S1 + LATEX PLUS KERAQUICK S1

SWIMMING POOLS, TANKS, etc.	**CERAMIC, MOSAICS AND PORCELAIN**			
TYPE OF SUBSTRATE	Ceramic tiles or glass/ceramic mosaics		Porcelain tiles	
	NORMAL SETTING	FAST SETTING	NORMAL SETTING	FAST SETTING
Cementitious screeds, screeds made with special binders, concrete and surfaces waterproofed with MAPELASTIC SMART	KERABOND PLUS + ISOLASTIC 50 KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2	GRANIRAPID	KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC 50	GRANIRAPID KERAQUICK S1
Fibreglass	KERAPOXY ADHESIVE	-	KERAPOXY ADHESIVE	-

KEY
HYDRAULIC BINDER-BASED adhesive
EPOXY adhesive

STONE

Dimensionally-stable stone (class A according to MAPEI classification system) not sensitive to staining		Stone with poor dimensional stability (class B according to MAPEI classification system) or stone sensitive to staining		Stone with **no** dimensional stability (class C according to MAPEI classification system) or resin-based recomposed material sensitive to heat
NORMAL SETTING	FAST SETTING	NORMAL SETTING	FAST SETTING	
KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC	GRANIRAPID KERAQUICK S1	KERALASTIC T KERAPOXY ADHESIVE	GRANIRAPID KERAQUICK S1	KERALASTIC T KERAPOXY ADHESIVE

STONE

Dimensionally-stable stone (class A according to MAPEI classification system) not sensitive to staining		Stone with poor dimensional stability (class B according to MAPEI classification system) or stone sensitive to staining		Stone with **no** dimensional stability (class C according to MAPEI classification system) or resin-based recomposed material sensitive to heat
NORMAL SETTING	FAST SETTING	NORMAL SETTING	FAST SETTING	
KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC	GRANIRAPID KERAQUICK S1	KERALASTIC T KERAPOXY ADHESIVE	GRANIRAPID KERAQUICK S1	KERALASTIC T KERAPOXY ADHESIVE

STONE

Dimensionally-stable stone (class A according to MAPEI classification system) not sensitive to staining		Stone with poor dimensional stability (class B according to MAPEI classification system) or stone sensitive to staining		Stone with **no** dimensional stability (class C according to MAPEI classification system) or resin-based recomposed material sensitive to heat
NORMAL SETTING	FAST SETTING	NORMAL SETTING	FAST SETTING	
KERAFLEX MAXI S1 ULTRALITE S1 ULTRALITE S2 KERABOND PLUS + ISOLASTIC	GRANIRAPID KERAQUICK S1	-	-	-
KERAPOXY ADHESIVE	-	-	-	-

The installation suggestions in this table are to be considered merely for indication purposes and refer only to normal conditions. For further information, refer to the relative Technical Data Sheet for each product. Defining the most suitable installation system is highly influenced by the conditions on site and the format of the tiles to be installed. For all special cases, contact Mapei Technical Assistance Department or the relative technical guides.

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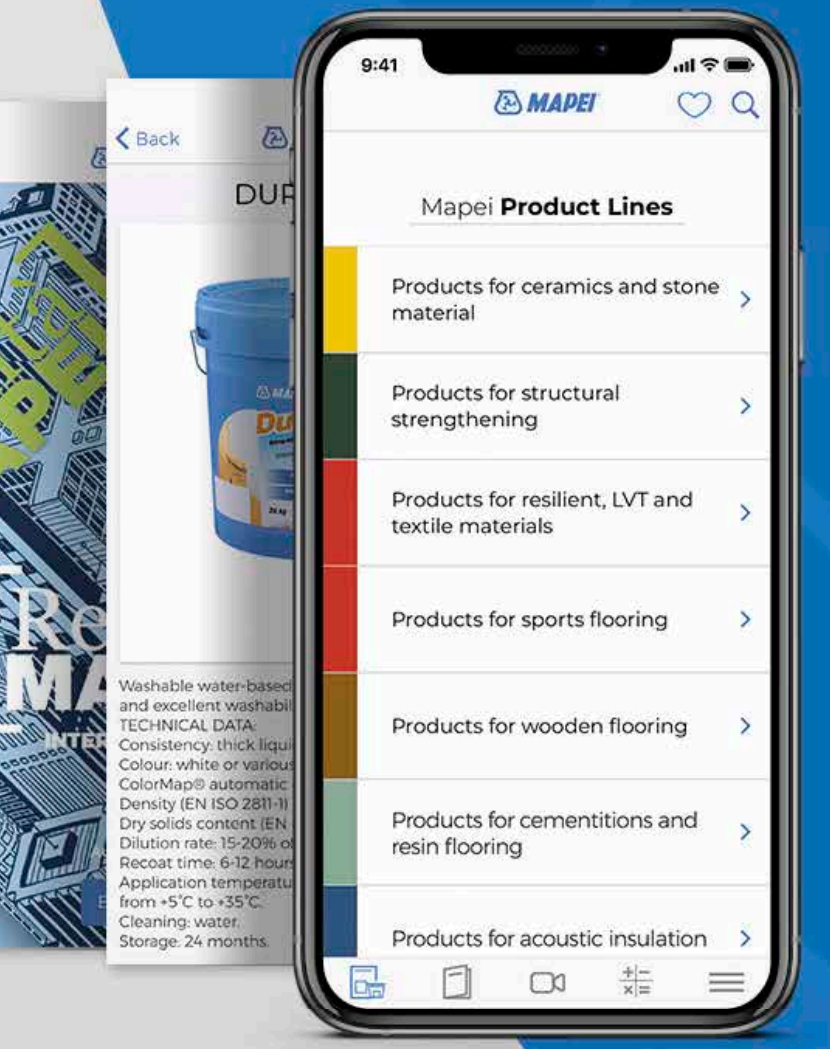

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