Argomenti n°2

1) Il candidato descriva le possibili cause e le attività necessarie per ripristinare l'uso di una strada asfaltata carrabile interna a un'area universitaria in cui si è creato un profondo avvallamento.
2) Il candidato descriva i materiali e le tecnologie utilizzabili per l'impermeabilizzazione di coperture piane.
3) Il candidato descriva le funzioni e l'utilità degli "snap" ad oggetti in Autocad.
4) Il candidato legga e traduca parte della scheda tecnica in lingua inglese del prodotto "Adesilex LC/R-P di MAPEI".

MAPEI

Adesilex LC/R-P

Water-based adhesive with high solids content and fast setting for wood flooring

WHERE TO USE
Interior installation of:

- wood strips or mosaics;
- wood strips that are not very sensitive to moisture.

Some application examples
Adesilex LC/R-P is used for laying wooden mosaics and wooden strips of stable timber species onto:

- cementitious screeds and concrete slabs;
- **Mapecem, Mapecem Pronto, Topcem** or **Topcem Pronto** based screed;
- chipboard and plywood boards;
- existing wooden floor;

Adesilex LC/R-P is suitable for laying parquet over under floor heating systems.

TECHNICAL CHARACTERISTICS
Adesilex LC/R-P is a synthetic resin-based adhesive in water emulsion that sets through evaporation and/or through the absorption of the water into the substrate and the wooden flooring.

Adesilex LC/R-P forms a film at temperatures from +5°C to +30°C, however it is recommended to lay wood flooring at a temperature not lower than +10°C. At this temperature the adhesive will take light foot traffic after 24 hours, and the floor can be sanded after 15 days.

Adesilex LC/R-P is a paste that is very easy to apply by trowel.

OBSERVATIONS
- Do not lay parquet in areas where doors and windows are not yet installed.
- Do not lay parquet if the screed, or the concrete slab, is not dry and has a moisture content higher than the one recommended by the floor manufacturers (check the moisture content through the entire thickness).
- Do not lay parquet over screed or concrete that may be subject to rising damp (the substrate must always have a damp-proof membrane).
- Do not lay parquet if its moisture content is not in equilibrium with the hygrometric conditions of the area on which the parquet will be installed.

RECOMMENDATIONS
- Lay the parquet at a temperature between +10°C and +35°C.
- Species of timber that are very sensitive to humidity (for example olive, Muhuhu, Cumarù, etc.), often require two component or one component

Adesilex LC/R-P

TECHNICAL DATA (typical values)	
PRODUCT IDENTITY	
Consistency:	thick paste
Colour:	beige brown
Density (g/cm³):	1.30
pH:	7.5
Dry solids content (%):	68.5
Brookfield viscosity (mPa·s):	240 (7 rotor - 5 rpm)
Min. film forming temperature:	approx. +5°C
COMPOSITION AND PROPERTIES OF THE MIXTURE (at +23°C and 50% R.H.)	
Min. recommended application temperature:	from +10°C to +35°C
Open time (min.):	approx. 45-50
Adjustability (min.):	approx. 30
Set to light foot traffic (hours):	after 24
Polishing (days):	after a minimum of 10
FINAL PERFORMANCE DATA	
Bonding wood concrete (N/mm²) - after 28 days at +23°C:	> 3.0 (concrete failure)
Shear strength DIN 281 (N/mm²): - after 3 days: - after 28 days:	> 3 > 3.5
Resistance to ageing:	excellent
Flexibility:	good

polyurethane adhesives, like **Lignobond**, **Ultrabond P990 1K** or **Ultrabond P902 2K**.

APPLICATION PROCEDURE

Preparing the substrate

The substrate must be thoroughly dry, absorbent, level, sound, free of dust, loose particles, paint, wax, oil, rust, and traces of gypsum.

The moisture content must be as prescribed by the parquet manufacturer. Check the moisture level throughout the entire thickness of the substrate, using a carbide hygrometer, baring in mind that the latter gives only approximate values. Floating screeds over insulation or light weight layers (eg. light weight concrete) must have a damp proof membrane to prevent rising damp. To repair cracks in the substrate, consolidate screeds, form fast-drying screeds and level uneven screeds, it is recommended to refer to the section in the MAPEI catalogue concerning the preparation of substrates or contact Technical Services Department.

Spreading the adhesive

Before using, stir the adhesive in its bucket. Any surface skin that may have formed must be removed. Apply **Adesilex LC/R-P** to the substrate with a MAPEI notched trowel for wood. The open time of **Adesilex LC/R-P** at +23°C and 50% R.H. is approx. 45/50 minutes, but varies according to the absorbency of the substrate, ambient temperature and humidity. If a skin forms the adhesive must be removed and replaced. Ambient temperature must be above +10°C.

Installing the parquet

The parquet to be installed must be stored in a dry, sheltered area not subject to vapour condensation and must be insulated from the ground. Before installing, check that the moisture level in the wood and the ambient humidity are as prescribed by the manufacturer. Press the wood parquet firmly into the wet adhesive to ensure good contact.

Leave an expansion joint of approximately 1 cm around the perimeter, columns, and other interruptions in the floor.

Do not bond edges of wood strips together (follow the parquet manufacturer's recommendations).

SET TO LIGHT FOOT TRAFFIC

Floors are set to light foot traffic after 24 hours.

Polishing the parquet

Ensure that the wood has reached the proper stability and that the adhesive is completely dry. Wait at least 10 days.

Cleaning

Tools can be cleaned and smudges removed with water while **Adesilex LC/R-P** is still fresh. After hardening, remove mechanically or **Pulicol 2000**.

CONSUMPTION

Depending on the type of substrate, and using a MAPEI trowel for wood, consumption is 800-1000 g/m².

PACKAGING

Adesilex LC/R-P is available in 20 kg drums and beige colour.

STORAGE

Stored in a cool place in its original unopened packaging **Adesilex LC/R-P** is stable for 12 months.

N.B.: *Protect from frost during transit and storage. Avoid prolonged exposure to temperatures below 0°C.*

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Adesilex LC/R-P is not considered as dangerous according to the current regulations regarding the classification of mixtures. It is recommended to wear protective gloves and goggles and to take the usual precautions for the handling of chemicals.
For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

All relevant references for the product are available upon request and from www.mapei.com

Adesilex LC/R-P

280-2-2016 (GB)

MAPEI®

BUILDING THE FUTURE

Argomenti n°7

1) Il candidato illustri le varie tipologie di pitture interne applicabili a pareti e/o soffitti descrivendone i cicli di applicazione.
2) Il candidato descriva le tipologie di PLE, il loro utilizzo e limiti operativi.
3) Il candidato descriva la funzione "Corrispondenza con proprietà" in Autocad.
4) Il candidato legga e traduca parte della scheda tecnica in lingua inglese del prodotto "Adesilex P9 Express di MAPEI".

MAPEI

Adesilex P9 Express

High performance, rapid-setting cementitious adhesive with extended open time and workability for bonding ceramic tiles

ECT
EPD
THE INTERNATIONAL EPD® SYSTEM

CLASSIFICATION ACCORDING TO EN 12004

Adesilex P9 Express is a C2FE class cementitious (C), improved (2), rapid (F), with extended open time (E) adhesive.

*The conformity of **Adesilex P9 Express** is certified by the **TT** certificates **No. 18/17627-2116** and **No. 18/17627-2117** issued by the LGAI Technological Center S.A. laboratory.*

WHERE TO USE

Bonding all types of ceramic tiles and mosaics on internal and external floors and walls.
Adesilex P9 Express is a mixture of rapid-setting hydraulic binders but, since it is not a rapid-drying product, it is only suitable for natural stone that does not suffer from staining caused by moisture.

Some application examples

- Bonding ceramic tiles, stone (if not susceptible to staining caused by damp) and mosaics on the following types of substrate:
  - walls with natural finish render or cementitious mortar;
  - internal cellular cement block walls;
  - gypsum and anhydrite treated with **Primer G**;
  - plasterboard;
  - heated floors;
  - cementitious screeds, once sufficiently cured and dry;
  - internal painted walls; make sure the paint is well bonded.
- Repair work on floors in areas exposed to high foot traffic, in commercial settings and when floors need to be put back into service quickly.
- Rapid bonding work in bathrooms, showers, kitchens, commercial and public areas and on terraces or balconies.
- Overlaying old floors with new, non-absorbent flooring when the setting time of other types of cementitious adhesive is too long.
- Bonding small format tiles in swimming pools and tubs.

TECHNICAL CHARACTERISTICS

Adesilex P9 Express is a white- or grey-coloured powdered adhesive made from a mixture of special cement, graded aggregates, synthetic resin and set accelerators that allow the adhesive to form a strong bond within just 3-4 hours of application. As a result, floor and wall coverings bonded with **Adesilex P9 Express** are ready to be used extremely quickly. Floors set to foot traffic after just 4 hours and may be put into service after 24 hours. Once hardened, **Adesilex P9 Express** is resistant to freezing weather and water.
When mixed with water, it forms mortar with the following characteristics:

- good workability;
- extended maintenance of workability in the bucket (45 minutes);

Adesilex P9 Express

Installation of stone-effect floor tiles over existing flooring

TECHNICAL DATA (typical values) Complies with the following standards:	– EN 12004 (C2FE) – ISO 13007-1 (C2FE)
PRODUCT IDENTITY	
Consistency:	powder
Colour:	white or grey
Bulk density (kg/m³):	1300
Dry solids content (%):	100
EMICODE:	EC1 Plus - very low emission
APPLICATION DATA (at +23°C and 50% R.H.)	
Mixing ratio:	100 parts of **Adesilex P9 Express** with 25-27 parts of water by weight (grey) or 100 parts of **Adesilex P9 Express** with 26-28 parts of water by weight (white)
Consistency of mix:	paste
Density of mix (kg/m³):	1500
pH of mix:	13
Pot life of mix:	45 mins.
Application temperature:	+5°C to +30°C
Open time:	30 mins.
Adjustment time:	15 mins.
Grouting joints in wall tiles:	after 4 hours
Grouting joints in floor tiles:	after 4 hours
Set to foot traffic:	after 4 hours
Ready to use:	after 24 hours
FINAL PERFORMANCES	
Adhesion (N/mm²): **– initial bond strength (after 28 days):** **– bond strength after application of heat source:** **– bond strength after immersion in water:** **– bond strength after freeze-thaw cycles:** **– bond strength after 6 hours:**	 1.8 1.5 1.1 1.3 0.6
Resistance to alkalis:	excellent
Resistance to oils:	excellent (poor resistance to vegetable oils)
Resistance to solvents:	excellent
Service temperature:	-30°C to +90°C

- perfect bonding to all materials normally used in the building industry;
- hardening with no significant shrinkage;
- extended open time;
- the white version has very high white point.

The environmental impact of **Adesilex P9 Express** during its entire life cycle has been measured using the LCA (Life Cycle Assessment) method and the results are reported in the EPD (Environmental Product Declaration in compliance with ISO 14025 and EN 15804 standards) N° S-P-01111, certified and published by EPD International.
Adesilex P9 Express has very low emission of VOC (Volatile Organic Compounds), thereby safeguarding the health of both those who apply the product and those who use areas in which it is applied, and is certified EC1 Plus.
Adesilex P9 Express helps earn important LEED credits.

RECOMMENDATIONS

- Sand anhydrite screeds, remove all dust and prime with **Eco Prim T** diluted 2:1 with water or with **Primer G** before applying the cementitious adhesive.
- Prime gypsum and plasterboard substrates with **Primer G** or **Eco Prim T** before applying the cementitious adhesive.
- Do not apply on floors or walls subject to large movements or vibrations (in wood, cement-fibre, etc.).
- Do not use on prefabricated concrete structures or on cast concrete if not fully cured.
- Do not use for marble or artificial engineered stone subject to large movements in moist conditions (green marble, certain types of slate and sandstone categorised as class C dimensional stability according to MAPEI standards). In these cases, use **Keralastic**, **Keralastic T** or **Kerapoxy**.

APPLICATION PROCEDURE

Preparation of the substrate

Substrates on which **Adesilex P9 Express** is to be applied must be flat, strong, have no crumbling areas and have no traces of grease, oil, varnish, wax, etc.
Adesilex P9 Express may take longer to set on damp substrates.
Cementitious substrates must not shrink after bonding the tiles. Therefore, in good weather, render must be cured for at least one week per cm of thickness and cementitious screeds must be cured for at least 28 days, unless they are made from special MAPEI screed binders such as **Mapecem**, **Mapecem Pronto**, **Topcem** or **Topcem Pronto**. If the surface is too hot due to direct sunlight, cool it down with water.
Gypsum substrates and anhydrite screeds must be perfectly dry (maximum residual moisture content 0.5% and 0.3% for heated screeds), strong, free of all traces of dust and treated with **Primer G** or **Eco Prim T** before applying **Adesilex P9 Express**. Use **Mapegum WPS** or products from the **Mapelastic** range to waterproof substrates in damp surroundings.

Preparation of the mix

A 25 kg bag of grey **Adesilex P9 Express** should be mixed with approx. 6.3-6.8 litres of water.
A 25 kg bag of white **Adesilex P9 Express** should be mixed with approx. 6.5-7 litres of water.
Pour the **Adesilex P9 Express** into a container with clean water while mixing and keep mixing with an electric mixer to form a smooth, lump-free mix.
Leave it to stand for a few minutes and mix briefly again before application.
The adhesive must be used within 45 minutes of mixing.

Spreading the mix

Apply **Adesilex P9 Express** on the substrate using a notched trowel. Use a trowel that allows a perfect wetting of the back of the tiles.
To guarantee a good bond, apply a thin layer of **Adesilex P9 Express** on the substrate using the smooth edge of the trowel and then immediately apply a second layer of **Adesilex P9 Express** to form the thickness required using a notched spreader suitable for the type and size of tiles to be bonded.
If the substrate is particularly absorbent and the surrounding temperature is high, it is recommended to wet the substrate before spreading **Adesilex P9 Express** to extend its open time.

Bonding tiles

There is no need to wet the tiles before installing them. However, if the back faces are particularly dusty, rinse them by dipping them in clean water.
The open time for **Adesilex P9 Express** is approximately 30 minutes in normal temperature and humidity conditions. When the surrounding conditions are not ideal (direct sunlight, dry wind, high temperatures, etc.), or if the substrate is particularly absorbent, this time will be considerably reduced.
Keep checking the adhesive applied on the substrate to make sure surface skin does not form and that it is still fresh. If surface skin forms, spread the adhesive again with the notched trowel. Do not wet the adhesive if surface skin forms. Water does not dissolve the skin and impedes adhesion.
Floor and wall coverings bonded with **Adesilex P9 Express** must be protected

Adesilex P9 Express

Adesilex P9 Express grey

Adesilex P9 Express white - ultrawhite

from water and rain for at least 3 hours and from direct sunlight and freezing weather for at least 24 hours after application.

Grouting and sealing
Fill the grout lines between the tiles after 4 hours with specific MAPEI cementitious or epoxy MAPEI grouting mortar, available in a wide range of colours. Seal expansion joints with specific MAPEI sealant.

Set to foot traffic
Floors set to foot traffic after around 4 hours.

Putting into service
Surfaces may be put into service after approximately 24 hours.

Cleaning
Clean tools and containers with water while **Adesilex P9 Express** is still fresh. Clean the surface of wall and floor coverings with a damp cloth before the adhesive hardens.

CONSUMPTION
2.5-5 kg/m².

PACKAGING
Grey and white **Adesilex P9 Express** is supplied in 25 kg paper bags.

STORAGE
25 kg paper bags of **Adesilex P9 Express** may be stored for 12 months in normal temperature and humidity conditions. This product conforms to the prescriptions of Reg. (EC) N. 1907/2006 (REACH) - Annex XVII, item 47.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION
Adesilex P9 Express contains cement that, when in contact with sweat or other body fluids, causes an irritant alkaline reaction and allergic reactions to those predisposed. It can cause damage to eyes. During use wear protective gloves and goggles and take the usual precautions for handling chemicals. If the product comes in contact with the eyes or skin, wash immediately with plenty of water and seek medical attention.

For further and complete information about the safe use of our product please refer to the latest version of our Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING
Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

LEGAL NOTICE
The contents of this Technical Data Sheet ("TDS") may be copied into another project-related document, but the resulting document shall not supplement or replace requirements per the TDS in force at the time of the MAPEI product installation. The most up-to-date TDS can be downloaded from our website www.mapei.com. ANY ALTERATION TO THE WORDING OR REQUIREMENTS CONTAINED OR DERIVED FROM THIS TDS EXCLUDES THE RESPONSIBILITY OF MAPEI.

This symbol is used to identify Mapei products which give off a low level of volatile organic compounds (VOC) as certified by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an international organisation for controlling the level of emissions from products used for floors.

All relevant references for the product are available upon request and from www.mapei.com

2830-3-2020 (GB)

MAPEI®
BUILDING THE FUTURE

Argomenti n°5

1) Il candidato illustri le varie tipologie di serramenti esterni indicando in base ai materiali costruttivi pregi, difetti e attività manutentive.
2) Il candidato illustri i possibili impieghi della videoispezione nel settore edilizio.
3) Il candidato descriva i blocchi e la loro utilità in Autocad.
4) Il candidato legga e traduca parte della scheda tecnica in lingua inglese del prodotto "Planitop Smooth & Repair di MAPEI".

MAPEI

Planitop Smooth & Repair

CE EN 1504-2 CE EN 1504-3

EN 1504-3 R2

EN 1504-2 (C) PRINCIPLES MC-IR

GEV-EMICODE EC 1 PLUS very low emission

Fast Track Ready

R2-class, rapid-setting shrinkage-compensated, thixotropic, fibre-reinforced, cementitious mortar applied in a single layer from 3 to 40 mm thick, for repairing and smoothing concrete

WHERE TO USE

Non-structural repairs and smoothing layers on internal and external, horizontal and vertical concrete surfaces, suitable for repairing structures exposed to the open air and in permanent contact with water.

Some typical application examples

- Quick repairs to deteriorated parts in concrete, the corners of beams, pillars, buffer walls, cornices and the front edges of balconies.
- Quickly smoothing over surface defects in cast concrete, such as honeycombs, spacer holes, construction joints, etc., before painting the surface.
- Repairing and smoothing over concrete mouldings on civil buildings, such as skirt roofs and protruding decorative elements.
- Repairing pre-cast concrete structures.

TECHNICAL CHARACTERISTICS

Planitop Smooth & Repair is a one-component, thixotropic mortar with very low emission of volatile organic compounds (EMICODE EC1 R Plus) made from special hydraulic binders, fine selected aggregates, synthetic polyacrylonitrile fibres, synthetic polymers and special admixtures, according to a formula developed in the MAPEI Research & Development Laboratories.
After mixing, the product forms mortar with good workability and with setting and hardening times that can be modulated by adding **Mapetard ES**. It is applied by trowel in a single layer from 3 to 40 mm thick to repair and smooth over concrete.
Planitop Smooth & Repair hardens without shrinking and is characterised by its excellent adhesion to concrete substrates.

After hardening, **Planitop Smooth & Repair** has the following characteristics:

- excellent bond strength to both old concrete (≥ 1.5 MPa) if wetted beforehand with water, and steel reinforcement, especially when treated with **Mapefer** or **Mapefer 1K** anti-corrosion and re-alkalising cementitious mortars, certified EN 1504-7 "*Corrosion protection of reinforcement*";
- high dimensional stability and, therefore, low risk of cracking during the plastic phase and when hardened;
- thermal compatibility to freeze/thaw cycles, measured as adhesion according to EN 1542;
- low permeability to water.

Planitop Smooth & Repair meets the requirements of EN 1504-9 ("*Products and systems for protecting and repairing concrete structures: definitions, requirements, quality control and conformity assessment. General principles for the use of products and systems*") and the minimum requirements of EN 1504-3 ("*Structural and non-structural repairs*") for non-structural R2-class mortars and the requirements of EN 1504-2 coating (C) according to principles MC and IR ("*Concrete surface protection systems*").

RECOMMENDATIONS

- Do not apply **Planitop Smooth & Repair** on smooth substrates: roughen surfaces beforehand.
- Do not apply **Planitop Smooth & Repair** on dry substrates.
- Do not add cement or admixtures, except **Mapetard ES**.

Planitop Smooth & Repair

Application of Planitop Smooth & Repair by trowel

Application of Planitop Smooth & Repair with a spatula

- Do not add water to the mix to make it more workable once it starts to set.
- Do not leave bags of **Planitop Smooth & Repair** exposed to the sun before use.
- Do not use **Planitop Smooth & Repair** if the temperature is lower than +5°C.
- Do not use **Planitop Smooth & Repair** if the bag is damaged or if it has been opened previously.
- Do not use **Planitop Smooth & Repair** for fixing elements accurately in place (use **Mapefill** or **Mapefill R**).

APPLICATION PROCEDURE

Preparation of the substrate

- Remove all deteriorated and loose concrete to form a solid, rough and strong substrate. Any areas previously repaired and which are not perfectly bonded must also be removed.
- Remove all dust, rust, cement laitance, grease, oil and paint from the concrete and reinforcement rods by sandblasting or hydro-sandblasting.
- Treat reinforcement rods with **Mapefer** or **Mapefer 1K**, according to the procedure illustrated in the relative Technical Data Sheet for each product.
- Wait until **Mapefer** or **Mapefer 1K** has dried.
- Saturate the substrate with water.
- Before carrying out repairs with **Planitop Smooth & Repair**, wait until excess water has evaporated off. If necessary, use compressed air to help remove excess water. The substrate must be saturated with water but with a dry surface.

Preparation of the mortar

Pour approximately 4.2 litres of clean water into a container and slowly add a 25 kg bag of **Planitop Smooth & Repair** while mixing. Carefully mix the blend for several minutes then remove any powder which has stuck to the sides and bottom of the container. Add more water to obtain the consistency required without exceeding the recommended amount (approximately 4.3-4.8 litres). Mix again for several minutes to form a well-blended, plastic consistency, lump-free mix.
To make it easier to form a smooth, even paste, use an immersion mixer or a low-speed drill with a spiral mixing attachment to avoid dragging air into the mix. Mixing by hand is not recommended, more than the recommended amount of water would be required. If manual mixing is unavoidable, use a trowel and press the mortar against the sides of the container to break down all the lumps.
Planitop Smooth & Repair remains workable for around 15 minutes at +10°C to +25°C. If the workability time of **Planitop Smooth & Repair** needs to be increased due to specific site requirements or if the weather is particularly hot, the set-retarding admixture **Mapetard ES** for rapid-setting cementitious mortar may be added to the product.
This special additive, which may be added at a rate of up to one 0.25 kg canister every 25 kg bag of **Planitop Smooth & Repair**, allows the already excellent workability time of the mortar to be extended by a further 15-20 minutes.
Thanks to its slight plasticising effect, adding **Mapetard ES** to **Planitop Smooth & Repair** allows the amount of mixing water to be reduced by 0.2-0.3 litres. In this case, pour approximately 4 litres of clean water and a canister of **Mapetard ES** into a container and slowly add a 25 kg bag of **Planitop Smooth & Repair** while mixing. Carefully mix the blend for several minutes then remove any powder which has stuck to the sides and bottom of the container. Add more water to obtain the consistency required without exceeding the recommended maximum amount of approximately 4.5 litres.

Application of the mortar

Apply a layer of mortar from 3 to 40 m thick with a trowel or putty knife; no formwork is required.
As soon as the mortar starts to set, tamp the surface with a sponge float. The waiting time required before carrying out this operation depends on surrounding weather conditions.
To paint and protect the surface, apply a coat of an elastomeric product from the **Elastocolor** line or an acrylic product from the **Colorite** line. The finishes available may be chosen from product's relative colour chart or from a much wider range of shades available using the **ColorMap®** automatic colouring system.
If the structures to be repaired are subject to high dynamic stress, it may be advantageous to apply a 2 mm thick layer of flexible smoothing and levelling compound such as **Mapelastic**, **Mapelastic Guard** or **Mapelastic Smart** before applying the coloured finish. In such cases, **Elastocolor Paint** must be used for the coloured finishing coat.

PRECAUTIONS TO BE TAKEN DURING AND AFTER APPLICATION

- Only use bags of **Planitop Smooth & Repair** which have been stored on their original, covered pallets.
- In hot weather, store the product in a cool area and use cold water to prepare the mix.
- In cold weather, store the product in a closed area at a temperature of +20°C and protect from frost. Use tepid water to prepare the mortar.
- After applying and tamping the mortar, particularly in hot or windy weather, we recommend curing **Planitop Smooth & Repair** carefully to avoid the mixing water evaporating too quickly, otherwise surface cracks may appear due to plastic shrinkage. Spray water on the surface for at least 24 hours after applying the mortar or use a curing agent from the **Mapecure** range. If a curing agent is applied, make sure that it is removed from the surface by sand-blasting or hydro-blasting before applying any other product, since the curing agent may impede a good bond of successive coating layers.

Cleaning

Mortar which has not yet hardened may be washed from tools using water. Once

Planitop Smooth & Repair: *thixotropic, fibre-reinforced, rapid-setting, shrinkage-compensated cementitious mortar for repairing and smoothing concrete conforming to the requirements of EN 1504-3 class R2 and EN 1504-2 coating (C), principles MC and IR*

TECHNICAL DATA (typical values)

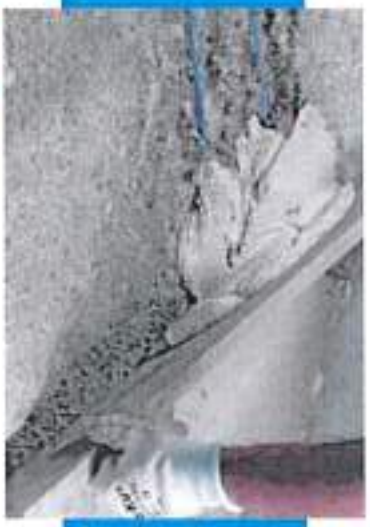
PRODUCT IDENTITY	
Class according to EN 1504-3:	R2
Type:	PCC
Consistency:	powder
Colour:	grey
Maximum diameter of aggregate (EN 1015-1) (mm):	0.4
Bulk density (kg/m³):	1,200
Dry solids content (%):	100
Ion chloride content: – minimum requirement ≤ 0.05% - according to EN 1015-17 (%):	≤ 0.05
EMICODE:	EC1 R Plus - very low emission

APPLICATION DATA OF PRODUCT (+20°C – 50% R.H.)	
Colour of mix:	grey
Mixing ratio:	100 parts of **Planitop Smooth & Repair** with 17-19 parts of water (4.3-4.8 litres of water per 25 kg bag) (*)
Consistency of mix:	thixotropic – trowellable
Density of mix (EN 1015-6) (kg/m³):	1,800
pH of mix:	12
Application temperature range:	from +5°C to +35°C
Pot life of mix:	approx. 15 minutes (**)
Waiting time before finishing with float:	approx. 30 minutes
Setting time:	approx. 30 minutes

FINAL PERFORMANCE (18% mixing water)

Performance characteristic	Test method	Requirements according to EN 1504-2 coating (C) principles MC and IR	Requirements according to EN 1504-3 for R2-class mortar	Performance of product
Compressive strength (MPa):	EN 12190	not required	≥ 15 (after 28 days)	≥ 5 (after 1 day) ≥ 15 (after 7 days) ≥ 18 (after 28 days)
Flexural strength (MPa):	EN 196/1	not required	not required	≥ 2 (after 1 day) ≥ 3 (after 7 days) ≥ 4 (after 28 days)
Compressive modulus of elasticity (GPa):	EN 13412	not required	not required	13 (after 28 days)
Bond strength on concrete (substrate type MC 0.40) according to EN 1766 (MPa):	EN 1542	for rigid systems with no traffic: ≥ 1.0	≥ 0.8 (after 28 days)	≥ 1.5 (after 28 days)
Thermal compatibility measured as bond strength according to EN 1542 (MPa): – freeze-thaw cycles with de-icing salts:	EN 13687/1	for rigid systems with no traffic: ≥ 1.0	≥ 0.8 (after 50 cycles)	≥ 1.5
Capillary absorption (kg/m²·h$^{0.5}$):	EN 13057	not required	≤ 0.5	≤ 0.4
Impermeability expressed as coefficient of permeability to free water (kg/m²·h$^{0.5}$):	EN 1062-3	W < 0.1	not required	W < 0.1 Class III (low permeability to water) according to EN 1062-1
Permeability to water vapour – equivalent air thickness S_D (m):	EN ISO 7783-1	Class I S_D < 5 m Class II 5 m ≤ S_D ≤ 50 m Class III S_D > 50 m	not required	S_D < 5 Class I (permeable to water vapour)
Reaction to fire:	EN 13501-1	Euroclass		A1

(*) *If **Planitop Smooth & Repair** is admixed with **Mapetard ES** (one 0.25 kg canister per 25 kg bag) the mixing water must be reduced by 0.2-0.3 l.*
(**) *Adding **Mapetard ES** extends the workability time of **Planitop Smooth & Repair** by a further 15-20 minutes.*
N.B. *The performance characteristics of **Planitop Smooth & Repair** admixed with **Mapetard ES** are the same as the product without admixture.*



Smoothing of Planitop Smooth & Repair with a straight edge

Tamping Planitop Smooth & Repair

Planitop Smooth & Repair

hardened, cleaning is much more difficult, and it must be removed mechanically.

CONSUMPTION
Approximately 15 kg/m² per cm of thickness.

PACKAGING
25 kg bags and boxes containing 4 x 5 kg packets.

STORAGE
Planitop Smooth & Repair may be stored for up to 12 months in its original packaging. The product complies with the conditions of Annex XVII to Regulation (EC) N° 1907/2006 (REACH), item 47.
The product is available in special 25 kg vacuum-packed polyethylene bags which may be stored outside for the entire construction phase of the site. Rain has no effect on its characteristics.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION
Planitop Smooth & Repair contains cement that when in contact with sweat or other body fluids causes irritant alkaline reaction and allergic reactions to those predisposed. It can cause damage to eyes. In case of contact with eyes or skin wash immediately with plenty of water and seek medical attention. It is recommended to use protective gloves and goggles and to take the usual precautions for handling chemical products. For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING
Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

This symbol is used to identify Mapei products which give off a low level of volatile organic compounds (VOC) as certified by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an international organisation for controlling the level of emissions from products used for floors.

Our Commitment To The Environment
MAPEI products assist Project Designers and Contractors create innovative LEED (The Leadership in Energy and Environmental Design) certified projects, in compliance with the U.S. Green Building Council.

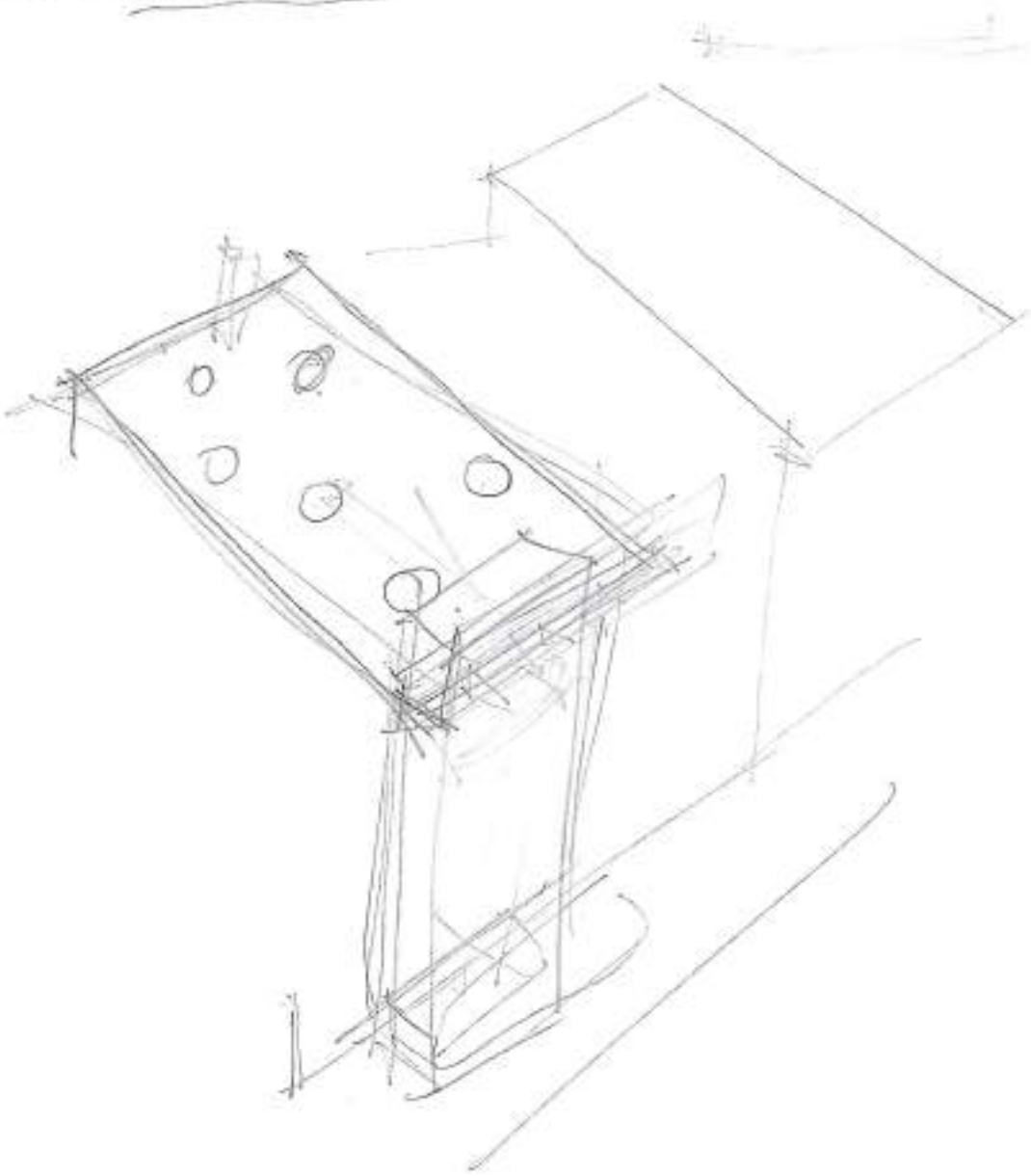
All relevant references for the product are available upon request and from www.mapei.com

1079-9-2014 (GB)

MAPEI
BUILDING THE FUTURE

Argomenti n°3

1) Il candidato descriva come intervenire in una copertura priva di dispositivi di sicurezza per ripristinare in più punti coppi rotti o scivolati, garantendo la sicurezza sia degli operatori che delle persone presenti nell'area.
2) Il candidato descriva i materiali e le tecnologie utilizzabili per la realizzazione di pavimentazioni da interni.
3) Il candidato descriva gli ambienti di lavoro denominati "spazio modello" e "spazio carta" in Autocad.
4) Il candidato legga e traduca parte della scheda tecnica in lingua inglese del prodotto "Antipluviol di MAPEI".



MAPEI

Antipluviol

Colourless water-repellent impregnator treatment based on silicon compounds in water solution

WHERE TO USE

Colourless protection against rain of exposed concrete structures, cement renders, cellular cement, facebricks, exposed concrete blocks, natural and artificial stone, etc.

Some application examples

- Repair of plastered walls exposed to rain.
- Colourless water-repellent protection of period buildings or those of special architectural value.
- Water-repellent treatment for walls, facebricks and natural stone.

TECHNICAL CHARACTERISTICS

Antipluviol is a colourless liquid based on silicon compounds in water ideal for impregnating all absorbent mineral materials used in building.

Applied to a porous surface, **Antipluviol** penetrates deeply and reacts with natural humidity to form a water-repellent layer inside pores and capillaries.

Thanks to this property, **Antipluviol** forms an efficient barrier against aggressive agents present in the atmosphere, which are carried into the material by rainwater.

Antipluviol does not form a film on the surface, therefore the material's permeability to water vapour is not modified and the appearance of the surface remains practically unaltered.

Antipluviol has excellent resistance to the alkalinity present in cement materials and to ultraviolet rays.

RECOMMENDATIONS

Impregnation with **Antipluviol** is unsuitable for waterproofing:

- horizontal surfaces (terraces);
- basements;
- water tanks;
- walls subject to rising damp carrying salts;
- lift wells and areas subject to water under pressure;
- gypsum surfaces;
- synthetic plasters and surfaces decorated with synthetic paint.

Carry out a preliminary test to ensure no colour changes take place on the substrate when **Antipluviol** is to be used on natural stones, coloured renders or on other types of substrates which show no uniform absorbency.

Antipluviol

TECHNICAL DATA (typical values)	
PRODUCT IDENTITY	
Consistency:	fluid liquid
Colour:	transparent
Density (g/m³):	approx. 1.02
Dry solids content (%):	approx. 5
Brookfield viscosity (mPa·s):	approx. 10 (shaft 1 - 100 revs)
APPLICATION DATA	
Dilution ratio:	ready to use
Surface drying time:	1-2 hours
Temperature range:	from +5°C to +35°C
FINAL PERFORMANCES	
Capillary action water absorption coefficient W_{24} (EN 1062-3) [kg/(m²·h^0.5)]: – facing bricks: – conventional render: – tuff stone: – cementitious smoothing layers:	 0.04 (15.60 saturation)* 0.05 (10.40 saturation)* 0.07 (6.80 saturation)* 0.38 (15.60 saturation)*
* *The figures in brackets refer to the same substrate not treated with Antipluviol*	
The product is considered as class III according to EN 1062-3 standards with a value of W_{24} < 0.1, which corresponds with low water absorption	

APPLICATION PROCEDURE

Preparing the substrate

Before application, it is essential to remove all dirt, dust, grease, oil, paint, salt laitance, moss and weeds from the surface that might prevent **Antipluviol** from penetrating deeply.

For old surfaces, the choice of cleaning system will depend on the kind of dirt involved. Washing with cold water is generally sufficient.

Cleaning with hot water or steam is particularly useful if there is grease or oil on the surface.

If there is no surface dirt, scrub carefully with a scrubbing brush and remove dust with compressed air.

Whatever the cleaning system used, **Antipluviol** should only be applied to dry surfaces. If water is present, it is unable to penetrate deep down into the material.

Preparing the product

Antipluviol is ready to use and should not be thinned with water.

Applying Antipluviol

The efficiency and durability of **Antipluviol**'s water-repellent action depends on the depth of penetration of the product. This parameter is directly proportional to the absorbency capacity of the material to be treated and the amount of impregnator applied.

In order to apply **Antipluviol** evenly, we recommend using a back-pack spray gun for large surfaces, or a roller or brush.

Apply a number of coats until the surface is completely saturated; apply each successive coat while the previous one is still wet.

On substrates with poor absorbency, be careful not to form layers of the product during application. Go over the surface with a sponge float if necessary while the product is still wet.

Once **Antipluviol** has been applied, the surface cannot be painted.

PRECAUTIONS TO BE TAKEN DURING AND AFTER APPLICATION

- Do not apply **Antipluviol** on damp substrates or on substrates that are not well cured.
- Do not apply **Antipluviol** if the temperature is lower than +5°C or higher than +35°C (the surface must be dry in all cases and must never be exposed to direct sunlight).
- Do not apply **Antipluviol** if the level of humidity is higher than 85%.
- Do not apply **Antipluviol** if it is about to rain or in windy weather.
- Please refer to the "Safety instructions for preparation and application" section.

Cleaning

Tools used for impregnation can be cleaned with water.

CONSUMPTION

The consumption rate is heavily influenced by the absorbency of the substrate, and varies approximately from 0.20-1 kg/m².

Listed below is a number of materials with their typical consumption rates:

– facing bricks:	0.50-0.75 kg/m²
– conventional render:	0.50-0.80 kg/m²
– tuff stone:	0.50-1.00 kg/m²
– cementitious smoothing layers:	0.20-0.40 kg/m²
– marble:	0.20-0.50 kg/m²

PACKAGING

Antipluviol is available in 25 and 5 kg plastic drums.

STORAGE

Antipluviol can be stored for 24 months a dry place, well away from flames and sources of heat at a temperature between +5°C and +30°C. Protect from frost.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Antipluviol is irritant for eyes and skin. Use protective gloves and goggles and take the usual precautions for handling chemical products. If in contact with eyes or skin, rinse immediately with plenty of water and seek medical advice.
For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application: for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application: in every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our web site www.mapei.com

All relevant references for the product are available upon request and from www.mapei.com

Antipluviol

326-3-2014

MAPEI

BUILDING THE FUTURE

Argomenti n°4

1) Il candidato illustri l'importanza del copriferro nei getti in calcestruzzo e le metodologie di intervento nel calcestruzzo in opera che presenta parti staccate con esposizione dei ferri di armatura.
2) Il candidato descriva la corretta gestione delle attività di scavo in trincea.
3) Il candidato descriva le funzioni e l'utilità dei layer in Autocad.
4) Il candidato legga e traduca parte della scheda tecnica in lingua inglese del prodotto "Mapetherm di MAPEI".

MAPEI

EN 998-1
GP-CS IV

Mapetherm AR1

One component cementitious mortar for bonding and levelling thermal insulating panels and insulation cladding systems

WHERE TO USE

Bonding all types of thermal insulation panels (foam/extruded polystyrene, foam polystyrene, mineral fibres, cork, etc.) directly on render, brickwork or concrete walls or ceilings.

Smoothing thermal insulation panels with embedded fibreglass reinforcing mesh on internal and external walls (thermal insulation cladding).

Some application examples

Bonding and smoothing insulating panels in interior areas and external foamed insulation on:

- cementitious renders or cement lime mortar renders;
- concrete;
- concrete blocks.

Also suitable for bonding and smoothing the following systems:

- insulation of the heating niches;
- insulation of under-tile roofing;
- insulation of attic room floors;
- internal insulation of room walls which are not underground;
- internal insulation of wall to floor walls in cellars/basements;
- internal insulation of mansard roofs;
- external insulation of ventilated façades.

TECHNICAL CHARACTERISTICS

Mapetherm AR1 is a grey powder consisting of cement, selected fine grained sands, synthetic resins and special additives prepared according to a formula developed in the MAPEI Research & Development laboratories. Mixed with water, **Mapetherm AR1** becomes a mortar with the following characteristics:

- low viscosity therefore easy to trowel;
- highly thixotropic: **Mapetherm AR1** can be applied on vertical surfaces without sagging and without letting even large sized insulating panels slip;
- bonding perfectly to all types of insulating panels and to all materials normally used in the building industry: levelling products, traditional render and old, well-adhered paints and coatings;
- hardens without noticeable shrinkage.

RECOMMENDATIONS

- Do not use **Mapetherm AR1** to bond insulating panels on metal surfaces or on substrates subject to strong movement (wood, asbestos cement, etc.).

Mapetherm AR1

Applying Mapetherm AR1 on the back of the panel with a notched trowel

Installing the insulating panels

Applying pressure on the panels once they have been installed. This is to ensure a good bonding to the surface

TECHNICAL DATA (typical values)	
Conformity with:	– EN 998-1 – ETAG 004 ETA 04/0061 - 10/0024 - 10/0025
PRODUCT IDENTITY	
Consistency:	powder
Colour:	grey
Maximum size of aggregate:	approx. 0,50
APPLICATION DATA (at +23°C - 50% R.H.)	
Mixing ratio with water (%):	21-24
Consistency of mix:	paste
Density of mix (kg/m³):	approx. 1.450
Application temperature:	da +5°C a +35°C
Workability time:	approx. 3 h
Open time:	approx. 30'
Adjustment time:	approx. 40'
Waiting time before finishing operation:	15 days
Consumption (kg/m²):	approx. 4.0-6.0: bonding insulting panels approx. 1.3-1.5: skimming (per mm of thickness)
FINAL PERFORMANCE	
Modulus of elasticity (N/mm²):	6.000
Flexural strenght after 28 days (N/mm²):	approx. 4.5
In service temperature:	from -30°C to +90°C

PERFORMANCE CHARACTERISTICS according to EN 998-1

Performance characteristic	Test method	TEST RESULT AND CONFORMITY TO THE REQUIREMENTS
Dry bulk density (kg/m³):	EN 1015-10	1.255
Compressive strenght (N/mm²):	EN 1015-11	8,23 Category CS IV
Adhesion (concrete) (N/mm²):	EN 1015-12	≥ 1 failure mode (FP) = B
Capillary water absorbtion [kg/(m²-min^{0,5})]:	EN 1015-18	0,19 Category W2
Water vapour permeability coefficient (μ):	EN 1015-19	15
Thermal conductivity ($\lambda_{c\ e_q}$) (W/mK):	EN 1745	0,34
Reaction to fire:	EN 13501-1	Euroclass A1

- Do not use if the panels have a smooth surface; good bonding may be impeded: foam polyurethane or mineral fibres with a surface coating of kraft paper, fibreglass gauze, extruded polystyrene with a surface skin, high density pressed foam polystyrene, etc.

- Do not bond insulating panels on damaged substrates or renders (in these cases always secure with anchors nylon mechanical fixings with additional centre nail for final fixation).

APPLICATION PROCEDURE

Substrate preparation

The substrate must be sound, free from dust and loose parts, oils, glue, etc. Gypsum substrates (hand or machine applied renders, prefabricated panels, etc.) must be perfectly dry and free of dust. Insulation panels must be treated with **Primer G** or **Eco Prim T** before bonding them with **Mapetherm AR1.**
It is recommended to use **Nivoplan** to even out variations in cementitious surface levels.

Preparing the mix

Pour **Mapetherm AR1** into a bucket containing 22% (by weight of powder) of clean water (approx. 5.5 l of water for 25 kg of powder). Mix with a low-speed mixer, until a homogeneous and lump free paste is obtained.
After 5 minutes standing it should be restirred. The mix is workable for at least 3 hours.

Spreading the mix

Used as adhesive
Spread an even layer of **Mapetherm AR1** on the back of the panels with a 10 mm notched spreader if the substrate is flat, or in a series of dots and beads if the wall is uneven.
After laying, press the panels down well to guarantee a good bond to the substrate, and check the flatness with a straightedge.

Used as smoothing and levelling compound
Once the adhesive is completely dry, at least 24 hours after applying the panels according to climatic conditions, spread an even layer of **Mapetherm AR1** on the surface and then embed **Mapetherm Net** alkali-resistant glass fibre mesh in the mortar. The **Mapetherm Net** must be pressed down with a smooth trowel on the fresh layer of mortar, and must overlap by at least 10 cm along the joints. After 12-24 hours, apply a second layer of **Mapetherm AR1** smoothing and levelling compound to form a compact, even surface suitable for the final coating which must only be applied once the smoothing layer is hardened and cured.

Cleaning

Tools and containers can be cleaned with water while **Mapetherm AR1** is still fresh.

CONSUMPTION

Bonding of insulating panels:	2-4 kg/m²
Bonding insulating panels with a uniform layer on the back of the panel, using a N. 10 notched trowel:	4-6 kg/m²
Smoothing:	1.3-1.5 kg/m² per mm of thickness (recommended thickness: 4 mm in 2 layers)

PACKAGING

Mapetherm AR1 is supplied in 25 kg paper bags.

STORAGE

Mapetherm AR1, kept in a dry place and in its original packing, can be stored for 12 months.
The product complies with the conditions of Annex XVII to Regulation (EC) N° 1907/2006 (REACH) - All. XVII, item 47.

SAFETY INSTRUCTION FOR PREPARATION AND APPLICATION

Mapetherm AR1 contains cement that when in contact with sweat or other body fluids causes irritant alkaline reaction and allergic reactions to those predisposed. It can cause damage to eyes. In case of contact with eyes or skin wash immediately with plenty of water and seek medical attention. It is recommended to use protective gloves and goggles and to take the usual precautions for handling chemicals. If the product comes in contact with the eyes or skin, wash immediately with plenty of water and seek medical attention.
For further and complete information about a safety use of our product please refer to our latest version of the Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application: for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application: in every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our web site www.mapei.com

Smoothing insulating panels: spreading the Mapetherm AR1

Smoothing insulating panels reinforced with a Fibreglass Mesh drowned into the coat of Mapetherm AR1

Bonding the insulating blocks to the façade with Mapetherm AR1

Mapetherm AR1

LEGAL NOTICE

The contents of this Technical Data Sheet ("TDS") may be copied into another project-related document, but the resulting document shall not supplement or replace requirements per the TDS in effect at the time of the MAPEI product installation. For the most up-to-date TDS and warranty information, please visit our website at www.mapei.com. ANY ALTERATIONS TO THE WORDING OR REQUIREMENTS CONTAINED IN OR DERIVED FROM THIS TDS SHALL VOID ALL RELATED MAPEI WARRANTIES.

All relevant references for the product are available upon request and from www.mapei.com

Private villa with foamed heating insulation - Hungary

457-10-2016 (GB)

MAPEI®

BUILDING THE FUTURE

Argomenti n°1

1) Il candidato descriva i possibili interventi di consolidamento di un solaio in laterocemento costituito da travetti Bausta e pignatte con evidenti segni di sfondellamento.
2) Il candidato descriva le tipologie di ponteggi e le fasi di allestimento e smontaggio.
3) Il candidato descriva il comando quotatura di Autocad illustrandone l'utilità, i tipi e le impostazioni.
4) Il candidato legga e traduca parte della scheda tecnica in lingua inglese del prodotto "Adesilex G19 di MAPEI".

MAPEI

Adesilex G19

Two-component, epoxy-polyurethane adhesive for resilient and textile flooring

WHERE TO USE

Extremely strong, tough, elastic, adhesive for general purpose use, particularly suitable for non-absorbent substrates or moisture-sensitive substrates (wood, metal, ceramic, stone, resin, PVC, rubber, etc.).
For use on floor in interior and exterior applications.
Specifically developed for the installation of rubber athletic tracks.
Also suitable as universal adhesive for rubber, PVC and all common resilient and textile floor covering types, especially in the event of extreme temperatures due to solar radiation, intense mechanical stress by lift truck, forklift, etc. or frequent washing (in particular when the floor coverings are not welded or sealed).

Some application examples

Use **Adesilex G19** for bonding:

- rubber athletic tracks and multisport flooring on asphalt;
- recycled rubber shock-absorbent flooring on asphalt in playgrounds;
- resilient flooring for indoor sports flooring, also onto waterproofing fiberglass underlays such as **Mapelay**;
- homogeneous and heterogeneous PVC, sheets and tiles;
- CV floor coverings;
- LVT;
- semi-flexible quartz vinyl floor tiles (VTC);
- textile floor coverings with all common backings (latex-primed, PVC and polyurethane foam, natural jute and Action-Bac® backed carpets etc.);
- needlepunch woven flooring also in latex;
- flocked textile flooring;
- linoleum with all kind of backings;
- polyolefin-based and chlorine-free floor coverings;
- PUR floor coverings.

TECHNICAL CHARACTERISTICS

Adesilex G19 is a two-component adhesive made from an epoxy-polyurethane polymer, component A, and a special hardener, component B.
When the two components are mixed together, they form an even coloured paste which is easy to apply with a suitable notched trowel.
After setting (around 24 hours), which takes place by means of a chemical reaction without any shrinking, **Adesilex G19** becomes though and resistant to moisture, water, heat and atmospheric agents, and adheres extremely well to almost all materials normally used in the building industry.

RECOMMENDATIONS

- Install in recommended temperatures, normally between +10°C and +30°C, in order to maintain workability and setting times.

- Do not install on substrates not protected from rising damp.
- Do not install flooring on not completely set or wet concrete (residual moisture content must be maximum 3.0%).
- Do not install flooring on fresh asphalt (wait at least 20 days).
- Do not install flooring on bituminous surfaces which might bleed oils.
- Do not use on curved surfaces or steps if it is not possible to hold the flooring in perfect adherence against the substrate until the adhesive has set.
- When installing thin flooring where the ribs of adhesive may shadow through, use **Adesilex G20** or **Adesilex G20 Fast**.
- When a rapid adhesive with faster setting is needed, use **Adesilex G19 Fast**.

APPLICATION PROCEDURE

Substrate preparation

Substrates must be dry, level, sound, mechanically strong, free of dust, loose particles, cracks, paints, wax, oil, rust, traces of gypsum or other products that can interfere with bonding.
The regulations of each country must be strictly followed.
Commonly, the moisture content must be as follows: max. 2%-2,5% for cementitious substrates, max. 0,5% for gypsum or anhydrite-based substrates.
It is essential to make sure there is no rising damp present. Un-bonded screeds laid over light-weight concrete or over insulation and screeds laid directly onto earth must be separated by a vapour barrier to prevent rising damp.
To repair cracks in the substrate, consolidate and waterproof screeds, form new fast-drying screeds and level uneven substrates, please refer to the relevant MAPEI documentation or contact the Technical Services.
External cement based surfaces may be levelled off with **Planicrete** mixed with cement and sand (with suitable particle size) or with **Adesilex P4**.
Use **Adesilex G19**, **Adesilex G19 Fast**, **Adesilex G20** or **Adesilex G20 Fast** (eventually mixed with suitable quartz or crumbled rubber) for repairing or smoothing asphalt surfaces. In these cases install the flooring with **Adesilex G19** as soon as the smoothing layer is set enough to take light foot traffic.

Acclimatisation

Before starting the installation, make sure that the floor covering and substrate are acclimatised to the recommended temperatures and R.H..

Mixing the adhesive

The two components of **Adesilex G19** are supplied in pre-measured proportions:
– component A: 9.4 parts by weight;
– component B: 0.6 parts by weight.

Blend the two components together with a mechanical mixer until an even paste is obtained. Setting times and pot life depend on the ambient temperature (see table). Setting times are much longer if the temperature is lower than +10°C.

Note: the resin (component A)/catalyser (component B) ratio must be strictly adhered to. Any variation in dosage will compromise the setting of the product.

Spreading the adhesive

The choice of trowel depends on the type of flooring to be installed and on the substrate: for smooth backings and smooth substrates use MAPEI No. 1 or TKB A1, A2 trowels; for textured and impervious backings and substrates use MAPEI No. 2, 3, 4 or TKB B1, B2, C1 trowels.
Only apply as much adhesive as can be covered within the open time (60 minutes) and with good transfer to the backing of the covering.

Installing the flooring

Follow the manufacturer's instructions for laying technique.
Lay in covering with short waiting time into the still wet adhesive bed: the adhesive ridge has to be impressed.
Take care to avoid air pockets and carefully rub the floor covering down to ensure good adhesive transfer to the backing. Avoid excessive stress at the seams. After installing the floor covering, it is always necessary to carefully roll it down again or to firmly rub it down.
If the flooring is not perfectly flat, put weights (such as bags of sand or similar) on the uneven areas, and on the joints and roll ends until the **Adesilex G19** has hardened (12-24 hours).
Extra care must be taken when installing external flooring if there are high temperatures or high variations in temperature (install flooring during the cooler hours of the day).
Flooring bonded with **Adesilex G19** is ready for light foot traffic after around 12-24 hours, while the adhesive sets completely after around 72 hours at +23°C.

The setting time of **Adesilex G19** at different temperatures is the following:

Temperature in °C	+30	+25	+20	+15	+10	+5
Time in hours	4	6	8	10	20	36

CONSUMPTION

Consumption varies according to the flatness of the substrate and the type of backing on the flooring material (and, therefore, the type of trowel used):
– trowel No. 1 or TKB A1/A2: 350-450 g/m²;
– trowel No. 2 or TKB B1; B2: 450-550 g/m²;
– trowel No. 3 or TKB C1: 550-750 g/m²;
– trowel No. 4: 750-1000 g/m².

TECHNICAL DATA (typical values)

PRODUCT IDENTITY		
	component A	component B
Consistency:	thick paste	fluid liquid
Colour:	beige, red, green and black	transparent
Density (g/cm³):	1.5	0.92

APPLICATION DATA (at +23°C - 50% R.H.)	
Mixing ratio:	component A : component B = 94 : 6
Density of mix (kg/m³):	1,450
Pot life of mix:	50-60 minutes
Application temperature range:	from +10°C to +30°C
Open time:	60 minutes
Adjustment time:	90 minutes
Initial setting:	9 hours
Final setting:	10 hours
Set to light foot traffic:	12-24 hours
Ready for use:	72 hours

FINAL PERFORMANCE DATA	
Temperature when in service:	from -40°C to +100°C
Resistance to moisture:	excellent
Resistance to ageing:	excellent
Resistance to solvents and oils:	good
Resistance to acids and alkalis:	good
Peel adhesion at 90° according to EN 1372 – after 14 days at +23°C (N/mm):	rubber: > 3 (floor-covering failure) PVC: > 3 (floor-covering failure)

Adesilex G19

Cleaning
Adesilex G19 may be removed from flooring, tools, clothing etc. with alcohol before it hardens. Once hardened, it must be removed mechanically or with **Pulicol 2000**.

COLOUR
Adesilex G19 is available in the following colours: beige, red, green and black. Special colours available upon request (min. 600 kg).

PACKAGING
Adesilex G19 is supplied in 10 kg, 5 kg and 2 kg kits.

STORAGE
Adesilex G19 remains stable for at least 24 months under normal environmental conditions in its original, sealed packaging.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION
Adesilex G19 component A is irritant for the eyes and skin. Both components A and B may cause sensitisation if they come into contact with the skin of those predisposed. **Adesilex G19** component B is corrosive and may cause burns, it is also harmful if swallowed or if it comes into contact with the skin. The product contains low molecular weight epoxy resins that may cause sensitisation if cross-contamination occurs with other epoxy compounds. When applying the product, use protective gloves and goggles and take the usual precautions for the handling of chemicals. If the product comes into contact with the eyes or skin, wash immediately with plenty of clean water and seek medical attention.
Adesilex G19 components A and B are also hazardous for aquatic life. Do not dispose of these products in the environment.
For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

PRODUCT ONLY FOR PROFESSIONAL USE.

WARNING
Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

All relevant references for the product are available upon request and from www.mapei.com

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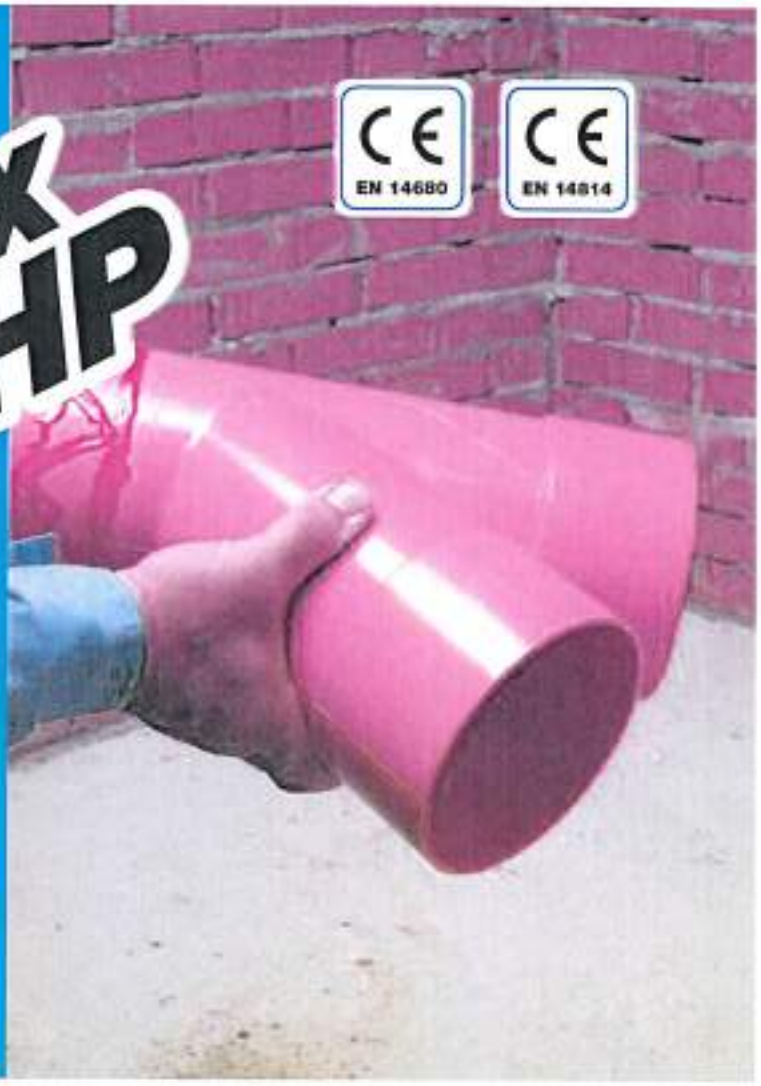
Argomenti n°6

1) Il candidato illustri le tipologie di tubazioni adeguate a reti di scarico indicando le problematiche e le attività manutentive.
2) Il candidato illustri i possibili impieghi della termografia nel settore edilizio.
3) Il candidato descriva la funzione delle tabelle degli stili di stampa in Autocad.
4) Il candidato legga e traduca parte della scheda tecnica in lingua inglese del prodotto "Adesilex PVC HP di MAPEI".

MAPEI

Adesilex PVC HP



Adhesive for bonding plastic pipes, including pipes carrying fluids at high pressure

WHERE TO USE

- Bonding PVC pipes carrying fluids at low and high internal pressure.
- Also suitable for bonding PMMA and ABS pipes.
- Adhesive for bonding pipes in civil and industrial drain systems and assembling sleeves, syphons and fittings in swimming pools, hydro-massage pools, irrigation systems and water systems in general.
- Bonding plastic pipes and guttering.
- May also be used for bonding corrugated pipes for electrical and plumbing systems.

TECHNICAL CHARACTERISTICS

Adesilex PVC HP is a red coloured adhesive made from synthetic resin dissolved in solvent.
Adesilex PVC HP has just the right viscosity and consistency for applying the adhesive without it running or dripping. It is supplied ready-mixed and sets and hardens rapidly.
The hardened film of adhesive remains as rigid as the pipes to be bonded and is resistant to temperatures of up to +70°C, with peaks of up to +95°C.
The hardened film of adhesive remains as rigid as the pipes to be bonded and is resistant to service temperatures of -15°C to +95°C.
Adesilex PVC HP is certified according to EN 14680 (adhesives for non-pressure thermoplastic piping systems) and EN 14814 (adhesives for thermoplastic piping systems for fluids with nominal pressure up to 16 bar).

APPLICATION TECHNIQUE

Surfaces must be perfectly dry, clean and de-greased before bonding them together. If necessary, clean surfaces with a cloth dipped in acetone to remove all traces of substances that could impede bonding.
The ends of the pipes must have no burrs and the internal pipe must have a bevelled edge to help spread the adhesive in an even layer during assembly.
Spread a thin, even layer of adhesive on both pipes to be bonded.
The bonding surface between the internal and external pipe is proportional to the diameters of the pipes to be bonded: as a general guide, the internal sleeve must enter the external sleeve by between 20 mm and 120 mm.
Immediately bond the two elements together by inserting one inside the other so that the adhesive is spread evenly over the entire contact surface.
Immediately after assembling the two parts, remove any excess adhesive with a clean cloth or a suitable tool or utensil.
The bonded assembly may be handled after a few minutes and is resistant to fluids under pressure after 24 hours.

WARNING

Adesilex PVC HP is a solvent-based adhesive: we recommend handling and storing it away from naked flames and sparks.
When the pipe system is used for the first time, wash thoroughly to remove all traces of dirt and solvent.
When using the product at low temperatures, warm the surfaces to be bonded with hot air.

Adesilex PVC HP

TECHNICAL DATA (typical values)	
PRODUCT IDENTITY	
Consistency:	thick fluid
Colour:	red
Dry solids content (%):	approx. 30
Open time:	1-5 min
Complete hardening:	24 h
FINAL PERFORMANCE	
Resistance to temperature:	+70°C, with peaks of up to +95°C
Certification:	– EN 14680 (adhesives for non-pressure thermoplastic piping systems); – EN 14814 (adhesives for thermoplastic piping systems for fluids under high pressure); carries CE marking

Cleaning
Adesilex PVC HP is easy to remove while still wet with acetone, trichloroethylene or white spirit.

PACKAGING
125 g tubes.

STORAGE
Adesilex PVC HP may be stored for 18 months in its original sealed packaging in areas at a temperature of between +5°C and +25°C.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION
Adesilex PVC HP is highly inflammable. We recommend storing away from naked flames and sparks, to avoid smoking, to prevent the build-up of electrostatic energy and to work in well ventilated areas. It also irritates the skin and the respiratory tract, may cause damage to the eyes and may cause drowsiness and dizziness. May cause irreparable damage if used for long periods. The product contains low molecular weight epoxy resins that may cause sensitisation if cross-contamination occurs with other epoxy compounds. It may form explosive peroxides. When applying the product it use protective gloves and goggles and take the usual precautions for handling chemicals. If the product comes in contact with the eyes or skin wash immediately with plenty of water and seek medical attention. Wear suitable protection for the respiratory system.
For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING
Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

LEGAL NOTICE
The contents of this Technical Data Sheet ("TDS") may be copied into another project-related document, but the resulting document shall not supplement or replace requirements per the TDS in force at the time of the MAPEI product installation.
The most up-to-date TDS can be downloaded from our website www.mapei.com.
ANY ALTERATION TO THE WORDING OR REQUIREMENTS CONTAINED OR DERIVED FROM THIS TDS EXCLUDES THE RESPONSIBILITY OF MAPEI.

All relevant references for the product are available upon request and from www.mapei.com

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