

PLANITOP SMOOTH & REPAIR ZERO

Quick-setting, fibre-reinforced, shrinkage-compensated, thixotropic cementitious mortar for repairing and smoothing concrete, applied in various thicknesses of from 3 to 40 mm in a single layer



CO₂ FULLY OFFSET PRODUCTS

Planitop Smooth & Repair Zero is part of the CO₂ Fully Offset in the Entire Life Cycle line of products. CO₂ emissions measured throughout the life cycle of products from the Zero line in 2023 using Life Cycle Assessment (LCA) methodology, verified and certified with EPDs, have been offset through the acquisition of certified carbon credits in support of renewable energy and forestry protection projects. A commitment to the planet, to people and to biodiversity. For more details on how emissions are calculated and on climate mitigation projects financed through certified carbon credits, visit the webpage zero.mapei.com.

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 Zero is a one-component, thixotropic mortar 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.

Thanks to its particular formulation the product has excellent fatigue behaviour up to at least 300,000 cycles, which gives repaired structures a high level of resistance to cracking, including when subject to dynamic loads induced during normal service conditions.

This particular characteristic, together with the requirements of EN 1504, helps increase the durability of elements restored with **Planitop Smooth & Repair Zero**.

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 Zero hardens without shrinking and is characterised by its excellent adhesion to concrete substrates.

After hardening, **Planitop Smooth & Repair Zero** 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 Zero** 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 Zero is a product with very low emission of volatile organic compounds (VOC), which safeguards the health and safety of installers and final users. It is certified as EC1 Plus by the German association GEV.

Planitop Smooth & Repair Zero helps earn important LEED credits.

Planitop Smooth & Repair Zero 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 Zero** on smooth substrates: roughen surfaces beforehand.
- Do not apply **Planitop Smooth & Repair Zero** on dry substrates.
- Do not add cement or admixtures, except **Mapetard ES**.
- 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 Zero** exposed to the sun before use.
- Do not use **Planitop Smooth & Repair Zero** if the temperature is lower than +5°C.
- Do not use **Planitop Smooth & Repair Zero** if the bag is damaged or if it has been opened previously.
- Do not use **Planitop Smooth & Repair Zero** for fixing elements accurately in place (use **Mapefill Zero** or **Mapefill R**).

APPLICATION PROCEDURE

TECHNICAL INFORMATION FOR APPLICATION

Composition of the mix:

100 kg of **Planitop Smooth & Repair Zero**
17-19 kg of water
*In the event that **Planitop Smooth & Repair Zero** dough is added with **Mapetard ES** (1 kg per 100 kg of product), the dough water must be reduced by 0.2-0.3 kg*

Thickness of layer:

from 3 to 40 mm

Application temperature range:

environment and substrate temperature +5°C to +35°C

Workability time:	approx. 15 min. (at +20°C) <i>The addition of Mapetard ES extends the pot life of Planitop Smooth & Repair Zero by a further 15-20 minutes.</i>
Waiting time for floating:	approx. 30 min.
Setting time:	approx. 30 min.

Preparation of the substrate

- Remove deteriorated, detached and contaminated concrete until a solid, resistant, and rough substrate is obtained. Any previous restoration work and any other coatings that are not perfectly adherent must be removed using suitable equipment (mechanical breakers, hydro-scarification, etc.).
- Clean the concrete from residues of previous milling operations, and the reinforcement rods from dust, rust, cement slurry, grease, oil, paint, and other harmful materials, by sandblasting and treating with high-pressure water.
- After preparation, the concrete surface to be repaired must be visibly clean and rough, with a roughness of no less than 5 mm, and with the inert fraction open and completely exposed to allow the mortar to properly set and adhere to the sub-layer.
- Treat reinforcement rods with **Mapefer** or **Mapefer 1K Zero**, according to the procedure illustrated in the relative Technical Data Sheet for each product.
- Wait until **Mapefer** or **Mapefer 1K Zero** has dried.
- Saturate the substrate with water.
- Before carrying out repairs with **Planitop Smooth & Repair Zero**, 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 4.3 litres of clean water into a container and slowly add a 25 kg bag of **Planitop Smooth & Repair Zero** 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 Zero remains workable for around 15 minutes at +10°C to +25°C.

If the workability time of **Planitop Smooth & Repair Zero** 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 Zero**, 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 Zero** 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 & RepairZero** 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.

The instructions for the preparation of mortar for laboratory test samples are given in the TECHNICAL DATA section.

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.



Application of Planitop Smooth & Repair Zero with a spatula



Smoothing of Planitop Smooth & Repair Zero with a straight edge



Tamping Planitop Smooth & Repair Zero

PRECAUTIONS TO BE TAKEN DURING AND AFTER APPLICATION

- Only use bags of **Planitop Smooth & Repair Zero** 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 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 Zero** 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 hardened, cleaning is much more difficult, and it must be removed mechanically.

CONSUMPTION

Approximately 16.5 kg/m² per cm of thickness.

PACKAGING

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

STORAGE

Planitop Smooth & Repair Zero may be stored for up to 12 months in its original packaging. The special packaging, made of 25 kg polyethylene vacuum bags, offers greater protection of the product from accidental rain.

Some characteristics of the product are particularly sensitive to the way it is stored. We, therefore, recommend storing the product in a dry and protected place at a temperature between +5°C and +35°C, in the original, tightly closed packaging.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our products can be found on the latest version of the Safety Data Sheet, available from our website www.mapei.com

PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)

PRODUCT IDENTIFICATION DATA

Class according to EN 1504-3:	R2
Type according to EN 1504-1:	PCC
Identification according to EN 1504-2: (methods and principles)	Coating (C) - MC and IR principles
Consistency:	powder
Colour:	grey
Maximum aggregate size:	0.4 mm
Chloride ion content according to EN 1015-17: (minimum requirement according to EN 1504 ≤ 0.05 %)	≤ 0.05 %

TECHNICAL INFORMATION FOR PRODUCT PREPARATION

Mixing ratio:	100 parts by weight of Planitop Smooth & Repair Zero with 18% of water
Mixing preparation:	mixing of the product according to EN 196-1

CHARACTERISTICS OF THE FRESH MIXTURE (at +20°C - 50% R.H.)

Colour of the mix:	grey
Consistency of the mix:	thixotropic/spatulable
Density of the mix:	1950 kg/m ³

FINAL PERFORMANCE

In accordance with the seasonings defined in the test methods

Performance characteristic	Test Method	Requirements EN 1504-2 (C) MC and IR	Requirements EN 1504-3 R2	Product performance
Compressive strength:				
- 3 hours	EN 12190	not required	-	8 MPa
- 1 day			-	14 MPa
- 28 days			≥ 15 MPa	24 MPa
Flexural strength:				
- 3 hours	EN 196-1	not required	not required	2.0 MPa
- 1 day				3.5 MPa
- 28 days				5.0 MPa
Adhesion to concrete by direct traction:	EN 1542	for rigid systems without traffic ≥ 1.0 MPa	≥ 0.8 MPa	≥ 1.5 MPa
Thermal compatibility - freeze-thaw cycles with de-icing salts (50 cycles):	EN 13687-1	not required	≥ 0.8 MPa	> 0,8 MPa
Capillary absorption:	EN 13057	not required	≤ 0.5 kg/m ² ·h ^{0.5}	≤ 0.5 kg/m ² ·h ^{0.5}
Impermeability expressed as water permeability coefficient W:	EN 1062-3	$W < 0,1$ kg/m ² ·h ^{0.5}	not required	$W < 0,1$ kg/m ² ·h ^{0.5} Class W ₃ (low permeability to water) according to EN 1062-1

Water vapour permeability (wet-cup - method B) expressed as equivalent air thickness S_d :	EN ISO 7783	Class I $S_d < 5$ m Class II $5 \text{ m} \leq S_d \leq 50$ m Class III $S_d > 50$ m	not required	$S_d < 5$ m Class I (permeable to water vapour)
Reaction to fire:	EN 13501-1	Euroclass	Euroclass	A1

NOTES:

Preparation of samples: compaction according to EN 196-1.

The performance characteristics of **Planitop Smooth & Repair Zero** admixed with **Mapetard ES** are the same as the product without admixture.

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

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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.

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