

MAPEGROUT 430 ZERO

Fine-grained, fibre-reinforced, normal-setting thixotropic mortar for repairing concrete. May also be applied with continuous-feed rendering machine



CO₂ FULLY OFFSET PRODUCTS

Mapegrout 430 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

Repairing the protective concrete layer on deteriorated concrete structures following oxidation of steel reinforcement.

Some application examples

- Repairing the corners of columns, beams and the front edges of balconies.
- Rebuilding the layer over steel reinforcement on structures in reinforced cement.
- Smoothing over surface defects, such as honeycombs, construction joints and spacer holes.
- Filling rigid joints.
- Quick repairs on pre-fabricated concrete elements damaged during handling.

TECHNICAL CHARACTERISTICS

Mapegrout 430 Zero is a pre-blended, compensated-shrinkage mortar in powder form made from cementitious binders, selected fine-grained aggregates, special admixtures and synthetic fibres according to a formula developed in 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 **Mapegrout 430 Zero**.

After mixing **Mapegrout 430 Zero** with water, it forms a mortar with a thixotropic consistency which is very easy to apply, even on vertical surfaces, at a thickness of between 5 and 40 mm without the need for formwork.

If **Mapegrout 430 Zero** is mixed only with water, it must be cured in a damp environment to allow the expansive properties of the product to develop fully and correctly.

To carry out expansion in the open air when damp curing is not guaranteed, **Mapegrout 430 Zero** may include 0.25% of **Mapecure SRA**, a special admix which has the property of reducing plastic and hydraulic shrinkage.

Mapecure SRA carries out an extremely important role in guaranteeing that the mortar cures more correctly, and when added to **Mapegrout 430 Zero** it may be considered a highly advanced technological system, in that the admixture has the capacity of reducing quick evaporation of water from the mortar and favouring the development of hydration. **Mapecure SRA** acts basically as an internal curing agent and, thanks to its interaction with some of the main components in the cement, it reduces final shrinkage by 20% to 50% compared with the same product without the admix. This means there will be a lower risk of cracking.

After hardening, **Mapegrout 430 Zero** has the following properties:

- medium mechanical strengths;
- modulus of elasticity, thermal expansion coefficient and water vapour permeability coefficient similar to medium-quality concrete;
- impermeable to water;
- excellent bond strength to old concrete, if dampened with water before application, and to steel reinforcement, especially if treated beforehand with **Mapefer** or **Mapefer 1K Zero**.

Mapegrout 430 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.

Mapegrout 430 Zero helps earn important LEED credits.

Mapegrout 430 Zero responds to the principles defined in EN 1504-9 (*"Products and systems for the protection and repair of concrete structures. Definitions, requirements, quality control and evaluation of conformity. General principles for use of products and systems"*), and the minimum requirements for EN 1504-3 (*"Structural and non-structural repair"*) for R3-class structural mortars.

RECOMMENDATIONS

- Do not use **Mapegrout 430 Zero** to repair structures subjected to intense compressive loads or high wear and abrasion, in such cases use **Mapegrout Thixotropic Zero** or **Mapegrout T60**.
- Do not use **Mapegrout 430 Zero** for pumping over long distances or to high levels (in such cases use **Mapegrout Easy Flow** or **Mapegrout Easy Flow Zero**).
- Do not apply **Mapegrout 430 Zero** on smooth concrete substrates. Roughen the surface and, where necessary, insert dolly rods.
- Do not use **Mapegrout 430 Zero** for fixing elements in place (in such cases use **Mapefill Zero**).
- Do not use **Mapegrout 430 Zero** for repairs requiring casting into formwork (in such cases, use **Mapegrout Hi-Flow Zero**).
- Do not add cement or admixtures to **Mapegrout 430 Zero**.
- Do not add water once the mix has started to set.
- Do not apply **Mapegrout 430 Zero** if the temperature is below +5°C.
- Do not use **Mapegrout 430 Zero** if the bag is damaged or if it has been opened previously.

APPLICATION PROCEDURE

TECHNICAL INFORMATION FOR APPLICATION

Composition of mix:	100 kg of Mapegrout 430 Zero 17.5-18.5 kg of water
Coat thickness:	5 to 40 mm
Application temperature range:	surrounding temperature and substrate temperature from +5°C to +35°C
Pot life of mix:	approx. 60 min. (at +20°C)
Waiting time between coats:	max 4 h

Preparation of the substrate

- Remove all deteriorated, detaching or contaminated concrete until a rough, sound and resistant substrate is obtained. Remove any previous repair work or coating if not perfectly adhering to the substrate, using suitable tools (mechanical demolishing, hydroscarifying etc.).
- Clean concrete from previous scarifying works and clean reinforcing rods from dust, cement laitance, rust, grease, oil, paint and other contaminants through sandblasting and high-pressure water jets.
- After preparation, the concrete surface to be repaired must be rough, with irregularities at least 5 mm deep and inert fraction exposed to allow correct adhesion of the mortar to the substrate.
- Treat any exposed rebar 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** dries.
- Soak the substrate with water.
- Before carrying out repairs with **MapegROUT 430 Zero**, wait until excess water has evaporated. If necessary, use compressed air to help remove excess water.

Preparation of the mortar

- Pour approximately 4.4-4.6 litres of water into a cement mixer.
- Switch the mixer on and slowly add **MapegROUT 430 Zero** in a continuous flow.
- If better curing in open air is required, add **Mapecure SRA** at a ratio of 0.25% of the weight of the mortar immediately after mixing (0.25 kg every 100 kg of **MapegROUT 430 Zero**).
- Mix for 1-2 minutes, make sure that all the ingredients are well blended, remove all powder which has stuck to the walls of the mixer and has not been perfectly amalgamated and mix for a further 2-3 minutes.
- A mortar mixer or drill with a mixer fitting may also be used, according to the quantity of mortar required. Mixing must be carried out at a low speed to avoid the entrapment of air. **MapegROUT 430 Zero** remains workable for approximately 1 hour at +20°C.

The mortar may be prepared with a continuous-feed rendering machine, loading the contents of the bags in the hopper of the machine and setting the flow-meter of the machine to get a steady flow of plastic mortar. Instructions for the preparation of mortar for Lab testing samples can be found in the TECHNICAL DATA section.

Application of the mortar

The mortar may be applied with a trowel, spatula or a rendering machine. No form-work is required, even on vertical surfaces and ceilings, and the maximum applicable thickness per layer is 40 mm.

If there is insufficient boundary support, filling layers of more than 30 mm must only be applied after inserting dolly rods and roughing the surface of the concrete. A layer of at least 20 mm thick must be applied over the rods.

Thinner layers may be applied even if there is no reinforcement, but the surface of the substrate must be well roughened before application.

If a second layer of **MapegROUT 430 Zero** is required, it must be applied before the first layer has completely set (after no more than 4 hours at +20°C).

If the repaired surface needs to be smoothed over, use one of the following products: **Monofinish**, **Planitop 200**, **Mapecofinish**, **Mapelastico**, **Mapelastico Guard**, or **Mapelastico Smart**, according to specific requirements.

Once hardened, the surface may be painted with **Elastocolor Paint**, **Elastocolor Rasante**, **Colorite Beton** or **Colorite Performance**.



Manual application of Mapegrout 430 Zero



Application of Mapegrout 430 Zero by spray

PRECAUTIONS TO BE TAKEN DURING AND AFTER APPLICATION

- Only use bags of **Mapegrout 430 Zero** which have been stored on their original pallets.
- In hot weather, store the product in a cool area and use cold water to prepare the mortar.
- In cold weather, store the product in a closed area and protect from frost. Use warm water to prepare the mortar.
- After application, and particularly in hot or windy weather, we recommend curing **Mapegrout 430 Zero** carefully, to avoid the mixing water evaporating too quickly, otherwise surface cracks may appear due to plastic shrinkage. Spray water on the surface immediately after form-release and cover with a waterproof sheet for at least 3 days.
- Surface anti-evaporation products may be applied alternatively to wet curing, provided they are selected according to following operational steps.

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

17 kg/m² per cm of thickness.

PACKAGING

25 kg bags.

STORAGE

Mapegrout 430 Zero may be stored for up to 12 months in its original packaging. The special 25 kg vacuum-packed polyethylene bags offer better protection of the product from rainfall. Some characteristic of the product are heavily influenced by storage conditions. It is advisable to stock the product in a dry and covered area at a temperature between +5°C and +35°C, in its original unopened 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 IDENTITY

Class according to EN 1504-3:	R3
Type according to EN 1504-1:	CC
Consistency:	powder
Colour:	grey
Maximum size of aggregate:	1.0 mm
Ion-chloride content according to EN 1015-17: (minimum requirement according to EN 1504 ≤ 0.05%)	≤ 0.05%

TECHNICAL INFORMATION FOR THE PREPARATION OF PRODUCT

Composition of mix:	100 parts by weight of Mapegrout 430 Zero with 18 % water
Preparation of mix:	mixing of product according to EN 196-1

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

Colour of mix:	grey
Consistency of mix:	tixotropic
Density of mix:	2050 kg/m ³

FINAL PERFORMANCE

According to curing defined in test methods

Performance characteristic	Test method	Requirements EN 1504-3 R3	Product performance
Compressive strength: - 1 day - 7 days - 28 days	EN 12190	- - ≥ 25 MPa	10 MPa 28 MPa 35 MPa
Flexural strength: - 1 day - 7 days - 28 days	EN 196-1	Not required	2 MPa 5 MPa 7 MPa
Compressive modulus of elasticity:	EN 13412	≥ 15 GPa	23 GPa
Bond strength by pull-off:	EN 1542	≥ 1.5 MPa	> 2.0 MPa
Resistance to accelerated carbonation:	EN 13295	Carbonation depth ≤ than reference concrete	meets specifications (*)
Capillary absorption:	EN 13057	≤ 0.5 kg/m ² ·h ^{0.5}	< 0.4 kg/m ² ·h ^{0.5}
Thermal compatibility - freeze-thaw cycles using de-icing salts (50 cycles): - Storm cycles (30 cycles): - Dry thermal cycles (30 cycles):	EN 13687-1 EN 13687-2 EN 13687-4	≥ 1.5 MPa ≥ 1.5 MPa ≥ 1.5 MPa	> 2.0 MPa > 2.0 MPa > 2.0 MPa
Reaction to fire:	EN 13501-1	Euroclass	A1

NOTES:

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

Test passed by using **Elastocolor Paint**, **Elastocolor Rasante**, **Colorite Beton** or **Colorite Performance** to protect the surface

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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