

MAPEI SOLUTIONS

for the precast concrete market





**TECHNOLOGICAL INNOVATION
IN THE PRECAST CONCRETE INDUSTRY
STARTS WITH MAPEI PRODUCTS.**

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Products for high quality precast concrete

Thanks to the extensive and consolidated experience, **Mapei** provides a comprehensive range of products and solutions aimed at bringing **technological innovation to the precast concrete sector**. **Mapei** proposes two distinct lines of **admixtures for concrete** specifically designed for the precast concrete industry in order to optimise the production processes and to achieve increasingly high quality levels.

Superplasticising admixtures

Dynamon NRG Line

Superplasticising admixtures and **set accelerators** specifically designed and developed for the production of prestressed, reinforced concrete structures.

Apart from drastically reducing the amount of mixing water required, thanks to their accelerating effect, **Dynamon NRG admixtures** also enable **high initial mechanical properties** to be obtained. They may reduce curing times and, in certain cases, completely eliminate the steam curing cycle.





Admixtures for Manufactured Products

Vibromix Line

Admixtures for the production of manufactured concrete product components and structures in vibro-compressed and/or extruded concrete.

Vibromix admixtures are used to optimise production processes by reducing compaction and stripping times. They guarantee that the components and structures produced are of a high quality and reduce problems related to efflorescence phenomenon.

Complementary products

Mapei has an extensive range of **complementary products** available to meet the requirements of the precast concrete industry.

- Form-release agents.
- Synthetic fibres for various applications: structural, fireproof and crack-prevention caused by plastic shrinkage, and they are all available in various length/diameter formats.
- Water-repellent and crystallising admixtures for the production of water-repellent and waterproof concrete elements.
- Set accelerators to help mechanical properties develop more quickly after short curing cycles and to optimise thermal cycles.
- Shrinkage-reducing admixtures to reduce crack phenomenon.
- Admixtures for the production of pervious elements and structures.
- Viscosity-modifying admixtures for the production of elements and structures in self-compacting concrete.
- Sealants in various chemical compositions to form elastic joints.
- Ready-mixed, shrinkage compensating mortars for repairing and skimming elements.
- Ready-mixed, shrinkage compensating mortars to create anchor points quickly.
- Resins for structural bonds.
- Elastomeric, crack-resistant, protective coatings with high resistance to chemicals.
- Cementitious-based, polyurea-based, bituminous and PVC systems for waterproofing roof tiles and other roofing elements and features.



Superplasticising admixtures

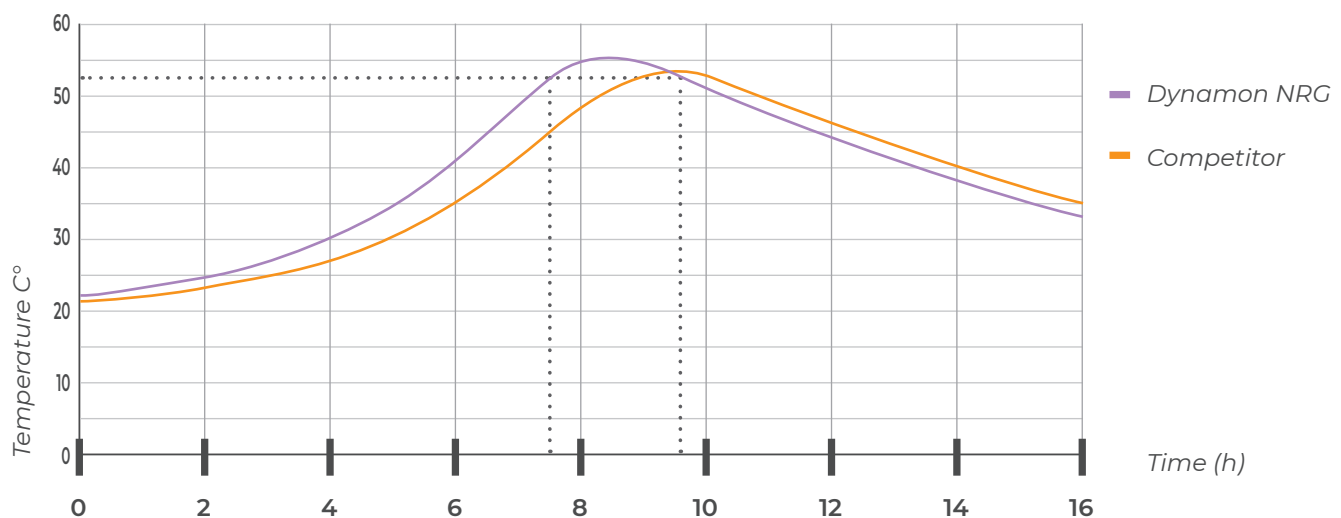
Dynamon NRG Line

Dynamon NRG is a line of **polycarboxylate ether-based superplasticising admixtures** for the precast concrete industry. The **Dynamon NRG** line is ideal for the production of elements in pre-stressed, precast, reinforced concrete. Superplasticisers from the **Dynamon NRG** line are specially formulated so they do not generate any delay in the hydration process and, therefore, guarantee high mechanical properties after short curing cycles. When dosage rates have been calibrated correctly, admixtures from the **Dynamon NRG** line can replace accelerated curing, as a result, improve the durability of the structures and elements produced.

The performance characteristics of admixtures from the **Dynamon NRG** make them suitable for the **production of self-compacting concrete**. This line of admixtures guarantees that concrete has a high level of slump, but without the negative effects of excessive viscosity in fresh concrete.



Comparison of temperatures in concrete admixed with Dynamon NRG and a competitor product



The graph illustrates how admixtures from the **Dynamon NRG** line anticipate the development of temperature and, as a result, achieve better mechanical characteristics in a shorter space of time. (e.g. $T=52^{\circ}\text{C}$: **Dynamon NRG** 7.5 h – Similar competitor product 9.5 h)



Dynamon NRG admixtures range

- **Dynamon NRG 1010**

Polycarboxylate-based superplasticising accelerator for extremely quick form-stripping operations (6-8 hours) without steam-curing.

- **Dynamon NRG 1014**

Polycarboxylate-based superplasticising accelerator for extremely quick form-stripping operations (16-18 hours) without steam-curing and viscosity-modifying agent for SCC.

- **Dynamon NRG 1022**

Superplasticiser for precast concrete ideal for flat work applications.

- **Dynamon NRG 1060**

Superplasticiser for precast concrete with very high development of mechanical properties after short curing cycles.



Plasticisers for semidry consistency and extruded concrete

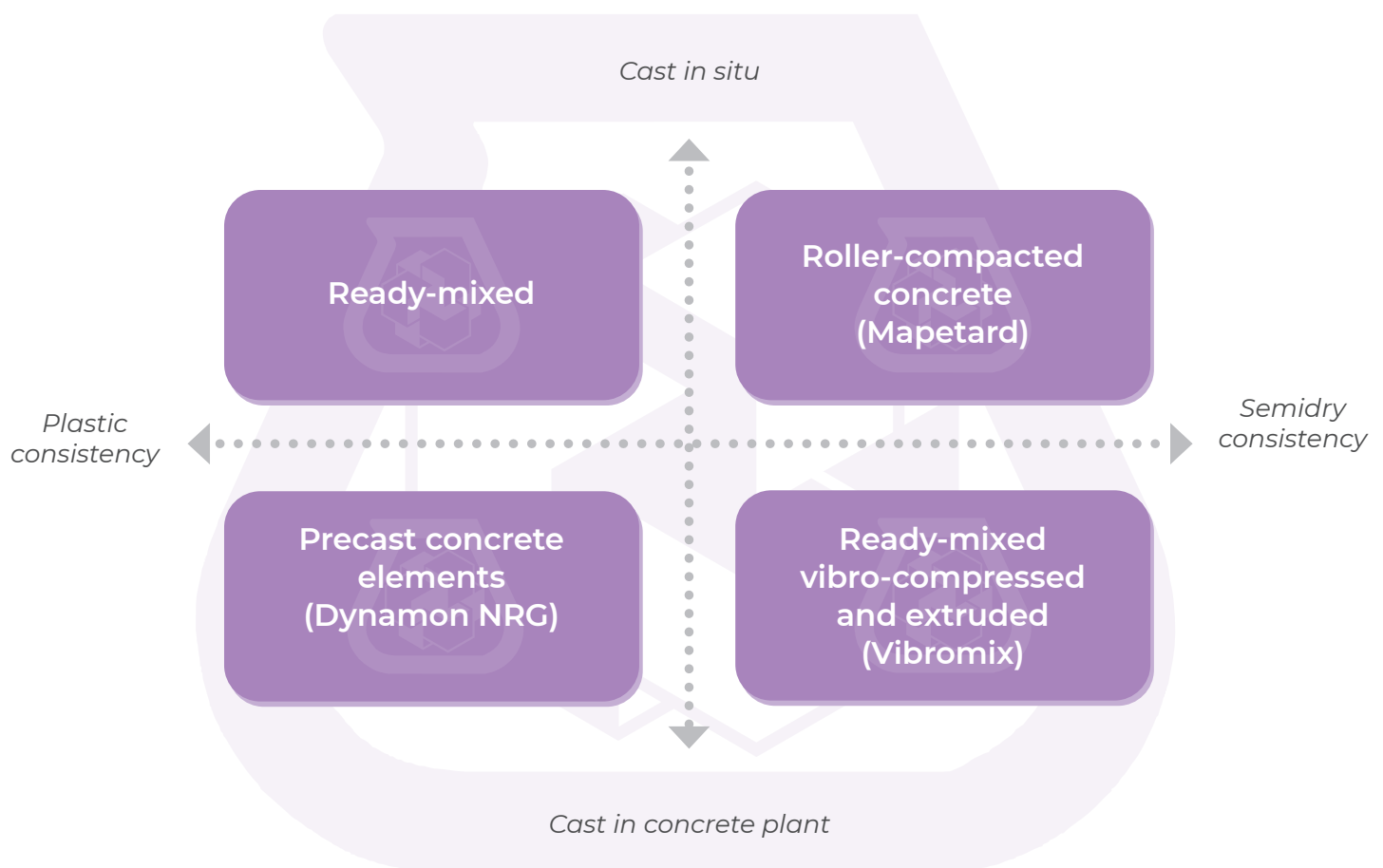
Vibromix Line

Vibromix is the line of **Mapei admixtures** specifically designed to optimise the manufacturing of semidry concrete elements.

Vibromix admixtures improves the mixing process, the mixtures workability, and shortens the filling time.

Vibromix accelerators guarantee a faster hardening in cold weather and **Vibromix** water-repellents reduce the efflorescence phenomenon.

Field of application



Each type of concrete described in the blocks has specific technical characteristics that must be accentuated by using the most appropriate admixture line.



Vibromix range of admixtures

- **Vibromix A1**
Plasticising and **surface improvement admixture** for extruded concrete.
- **Vibromix L2**
Water-reducing agent for high early strength.
- **Vibromix L4**
Plasticising for improved surface finish.
- **Idrocrete DM**
Highly effective water-repellent to control efflorescence in manufactured concrete products.



Complementary products

Form-release agents

Form-release agents are chemical products applied on the surface of formwork to make stripping operations easier. **Mapei** offers a **complete line of form-release agents** suitable for an extensive range technical and environmental requirements and recently developed a family of **vegetable oils and emulsion-based form-release agents** which, apart from offering excellent performance characteristics in terms of ease of application and surface finish of elements and structures, they are also non-toxic for users and are easy to dispose of. The **Mapei line of form-release agents** follow the **Assiad** classification system according to the chemical nature of the oils used and are grouped according to their area of use.



Form-release agents range

- **Mapeform 1500**
Pure **synthesised oil with low viscosity** for a wide range of uses.
- **Mapeform Eco 31**
Vegetable **oil-based** form-release solution in water emulsion for **fair-faced concrete**.

***Mapeform Eco 31** form-release agent is vegetable oil-based and respect the hygiene, volatile components and biodegradability criteria of the ASSIAD form-release classification table.*



Complementary products

Synthetic fibres

Structural polymer fibres are synthetic fibres available in various lengths and diameters that, when added to concrete, provide **additional three-dimensional strengthening or replace traditional lightweight reinforcement**, thereby improving its energy-absorbing capacity. Synthetic fibres help to improve the toughness index of concrete and to obtain a higher level of post-cracking mechanical strength. **Microfibers**, on the other hand, are used for non-structural applications, such as to **reduce micro-cracking** caused by plastic shrinkage or to reduce concrete's resistance to fire by adding a higher dose of fibres.

Macro synthetic fibres



- **Mapefibre BG55**

55mm long, embossed macro synthetic fibre for Precast Concrete applications. With high tensile strength and embossed surface, provides for a high level of concrete toughness, including replacement of Reinforcement in certain applications.

Micro synthetic fibres



- **Mapefibre NS18**

Anti-shrinkage polypropylene fibres to reduce cracking caused by plastic shrinkage. Length 18 mm.



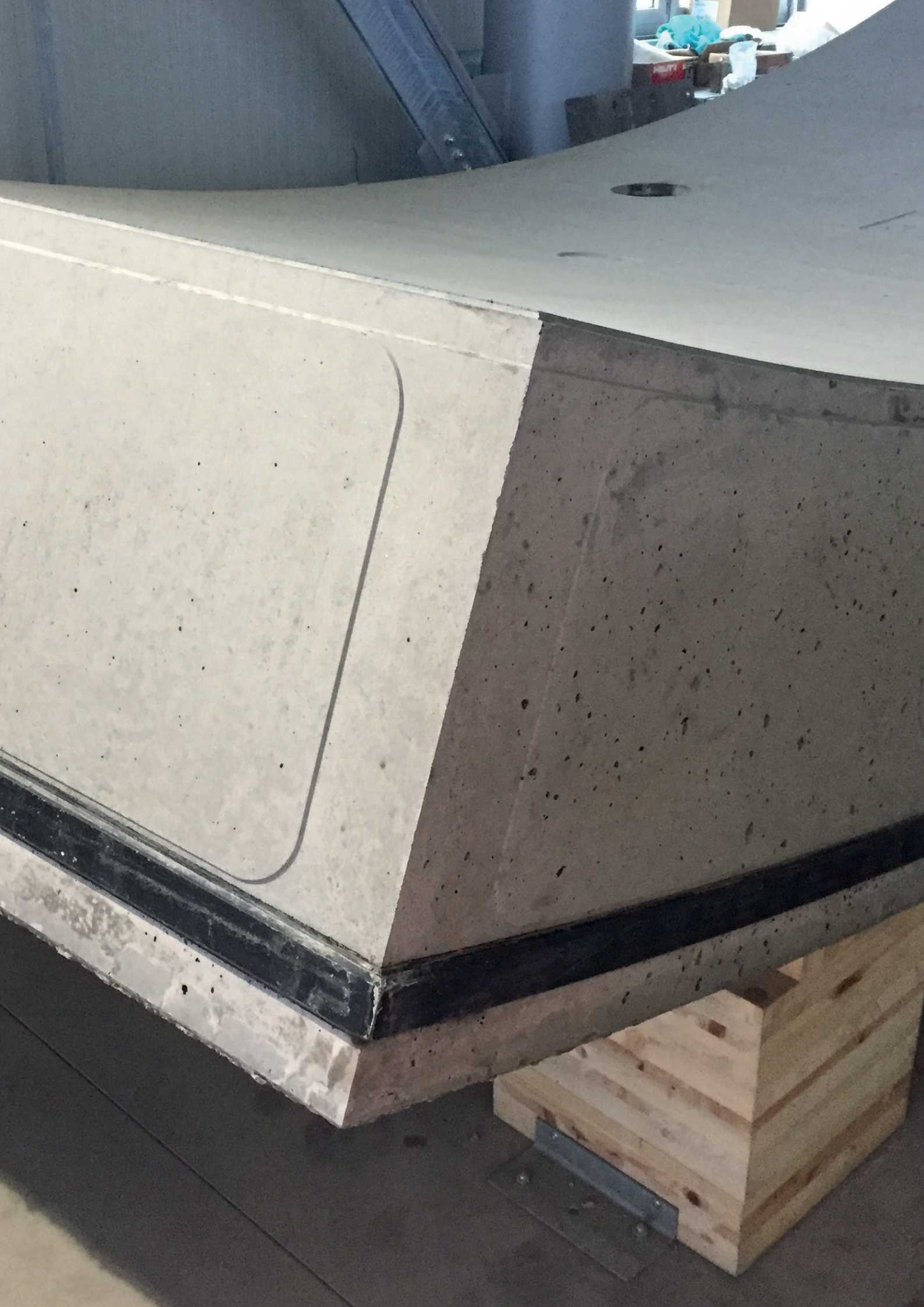
Hardening accelerators for concrete

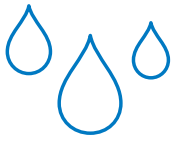
Mapei set accelerators are designed to **speed up the hydration rate of cement** increasing its early age strength. Thanks to the rapid development of mechanical strength, hardening accelerators enable **thermal curing cycles to be optimised** and **reduce form-stripping times** at low temperatures.

Hardening accelerators range

- **Dynamon HAA**
Chloride-free hardening accelerator for reinforced concrete with high initial mechanical strength.

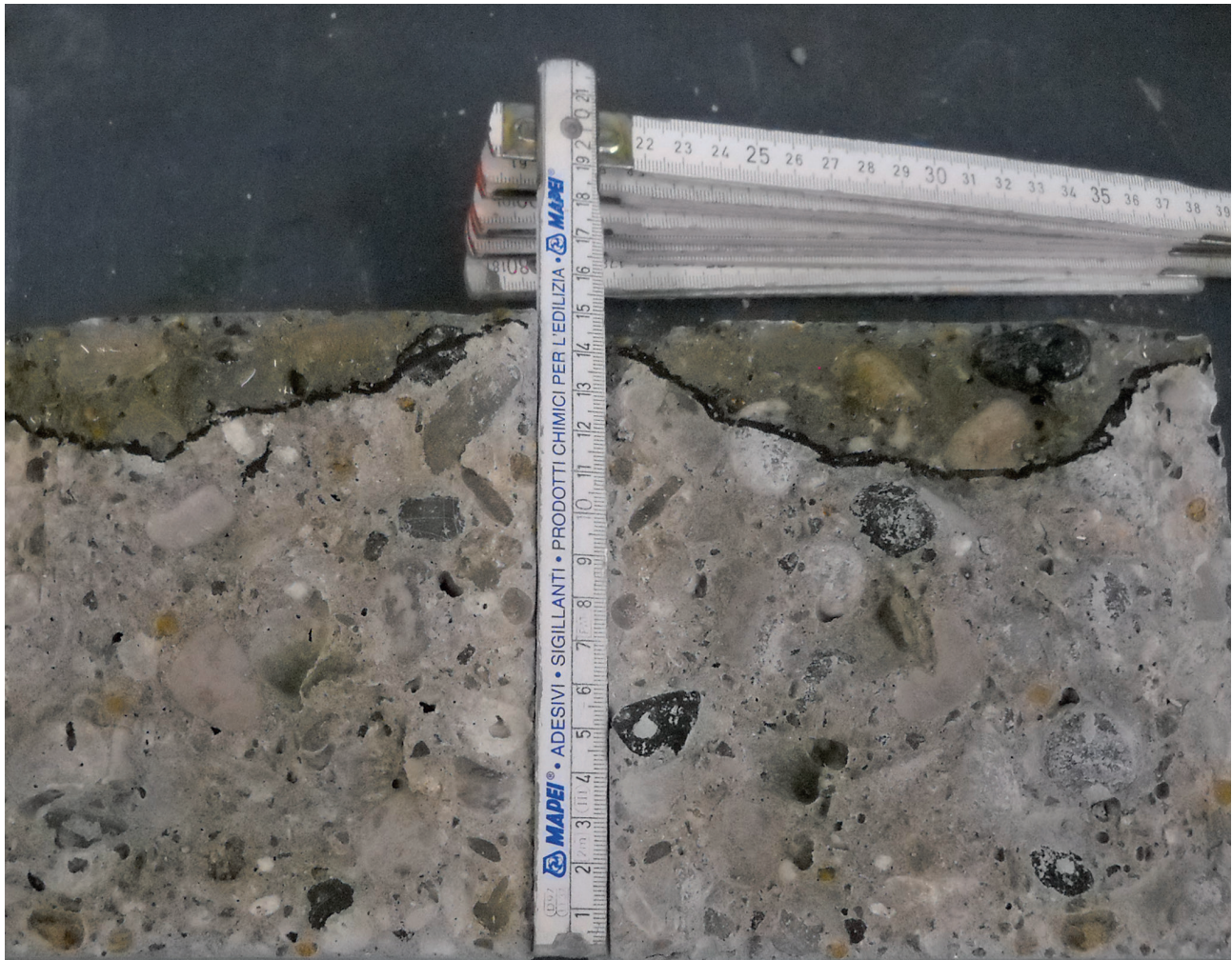






Permeability-reducing admixtures

Crystallising agents are **permeability-reducing admixtures**. By reacting with the water in concrete, they activate a secondary crystallisation process that progressively reduces micro-cracking and capillary porosity in the concrete.

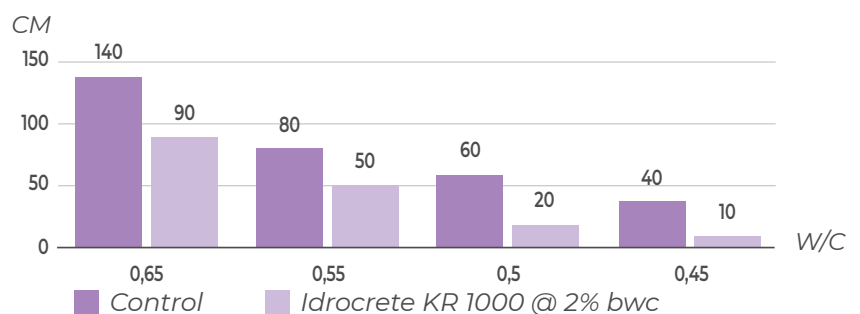


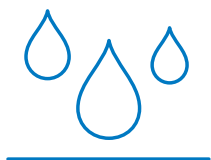
Crystallising admixtures

• Idrocrete KR 1000

Powdered crystallising admixture for the production of **watertight concrete**.

Effect of Idrocrete KR 1000 on the maximum penetration depth of water in concrete





Water-repelling admixtures

For the production of concrete blocks and self-locking blocks, **Mapei** has created a specific line of products to reduce water absorption and efflorescence phenomenon. Mapei mass water-repelling admixtures guarantee **uniform colour and resistance to rain water**.

Mass water-repelling admixture range

- **Idrocrete DM**

Water-repelling admixture for concrete and mortar with low water absorption and no efflorescence.

- **Idrocrete SB**

Water-repelling admixture for concrete and mortar with low water absorption and no efflorescence.





Drying shrinkage-reducing admixtures

Mapei shrinkage-reducing admixtures lower the effect of the drying shrinkage of concrete by acting on the surface tension of water in the capillary pores of the concrete and therefore reducing the pressure generated inside the pores.

Shrinkage-reducing admixture range

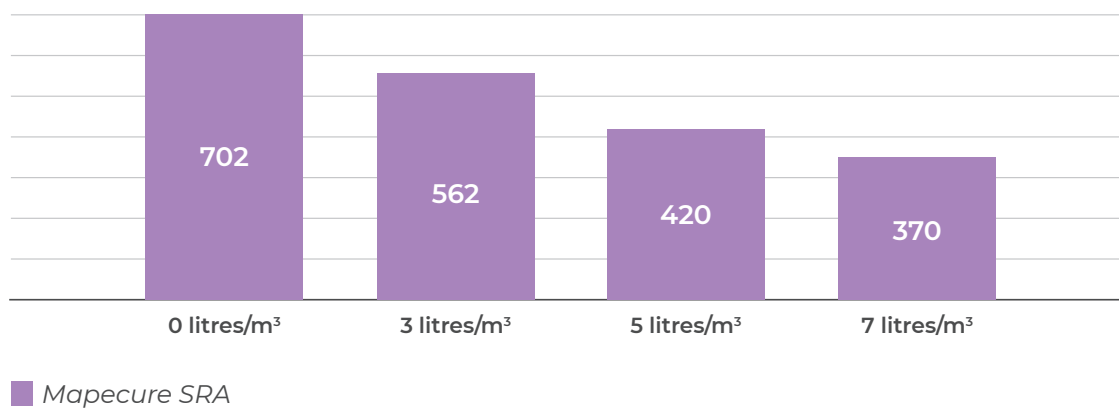
- **Mapecure SRA**

Admixture for cementitious mortar and concrete to reduce drying shrinkage for precast concrete applications.

- **Mapecure SRA 25**

Drying shrinkage reducing liquid admixture for precast concrete applications.

Concrete shrinkage by using different dosages of SRA admixtures (Water/cement ratio 0.55)







Viscosity-modifying admixtures

Mapei viscosity-modifying admixtures are designed to control surface bleeding and segregation in self-compacting concrete mixes.

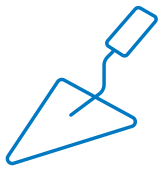
Viscosity-modifying admixture range

- **Viscostar 3K**

Multi-functional viscosity-modifying admixture for the production of **self-compacting concrete with no fillers**.







Repair and restoration mortars

Mortars for concrete repair and restoration are **ready-mixed, ready-to-use cementitious products** used to eliminate imperfections on the surface of concrete after stripping the formwork.

Coarse-textured **repair mortars** are used to **repair larger production defects**. Both types of mortar have shrinkage-compensating properties.

Mortars for concrete repair and restoration

- **Planitop Fine Finish**

Ultra fine textured skimming mortar for concrete; recommended for exposed finish surface from 0 to 3 mm thick.

- **Planitop Smooth & Repair R4**

Rapid-setting, shrinkage-compensating, fibre-reinforced, thixotropic cementitious mortar applied in a single layer from 3 to 40 mm thick to repair and smooth concrete.

- **Mapegrout T40 or T60 & Mapefer 1K**

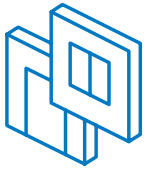
Shrinkage-compensating fibre-reinforced mortar for repairing concrete and reinforcement protection.

- **Mapegrout Fast-Set**

Fibre-reinforced, rapid-setting and hardening, shrinkage-compensating mortar for repairing concrete.







Anchoring mortars

Mapei anchoring mortars are ready-mixed, expansive mortars with a plastic or super-plastic consistency specifically designed for anchoring connecting elements between different structures.

Anchoring mortars range

- **Mapefill GP**
General Purpose Gout (Single phase shrinkage compensated)
- **Mapefill SP**
Precision Grout (Dual phase shrinkage compensated grout)
- **Mapefill MC06**
Micro Concrete (Dual phase shrinkage compensated grout)





Epoxy resin-based adhesives

Resin-based adhesives guarantee a sound **structural bond between precast elements** used to form structures. Their most frequent areas of use are for second pours, to monolithically fill cracks and to form bonds between ashlar stones in bridges and viaducts.

Resin-based adhesives range

- **Adesilex PG1**

Two-component, rapid-setting thixotropic adhesive for structural bonds.

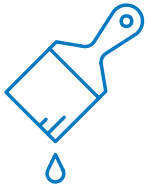
- **Adesilex PG4**

Two-component, thixotropic epoxy adhesive with modified rheology for bonding strips of PVC and to form structural bonds.

- **Eporip**

Two-component solvent free epoxy adhesive, for bonding between new and existing concrete including concrete sections or steel to concrete when rigid joints are required between interfacing structural elements.





Protective coatings

The application of elastomeric coatings on the surface of concrete **protects them against carbonation and cracking phenomenon**. They guarantee excellent resistance to ageing, freezing weather and de-icing salts and protect concrete against ingress of aggressive agents in the atmosphere (CO₂ - SO₂), thereby reducing the risk of deterioration.

- **Mapelastic Guard**

Two-component, elastic cementitious mortar for protecting large concrete structures subjected to high stress.

- **Mapelastic Smart**

Two-component, high flexibility cementitious mortar, for waterproofing concrete surfaces, balconies, terraces, basins, and swimming pools.

- **Antipluvial W**

Colourless, water-repellent silane and siloxane-based impregnator forming a hydrophobic, water-repellent layer inside the concrete pores and capillaries





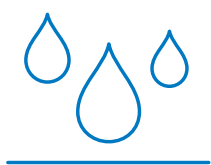
Sealant products

Polyurethane based sealants form a **strong bond with concrete** and with the surface of all materials used in the building industry. They are also highly flexible which makes them suitable for joints with movements.

Sealants range

- **Mapeflex PU45FT**
Rapid-hardening paintable polyurethane sealant and adhesive with high modulus of elasticity for movements up to 20%.
- **Mapeflex PU40**
Polyurethane, paintable sealant with a low modulus of elasticity for movements up to 25%.

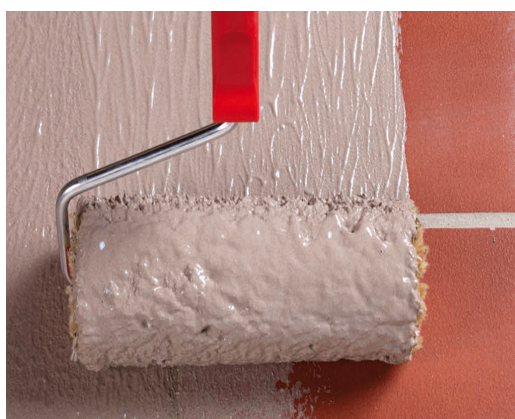




Waterproofing systems

Mapei has a wide choice of **waterproofing systems** for the surface of concrete, including polymer-modified cementitious systems, polyurea-based systems and synthetic membranes.

Waterproofing range



- **Mapelastic Smart**

Two-component, high-elasticity cementitious, waterproofing mortar (with crack-bridging capacity > 2 mm) applied by trowel or with a roller.



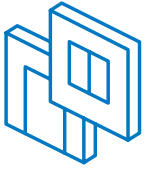
- **Purtop 1000N**

Two-component, solvent-free, pure polyurea membrane applied by spray with a high-pressure, bi-mixer type pump, to form waterproof coatings for hydraulic works, roofs and bridge decks directly on site.



- **Mapeplan TM**

Synthetic waterproofing membrane in flexible TPO/FPO polyolefin reinforced with polyester mesh, made from high quality raw materials and produced using the multi-extrusion coating process. **Mapeplan TM complies with EN 13956 standards.**



Evaporation-retarding admixtures

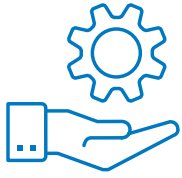
Mapei evaporation-retarding agents are liquid admixtures applied on the surface of fresh, placed concrete to extend the time available to carry out finishing operations and improve the final finish of concrete.

Evaporation-retarding admixtures range

- **Mapecrete Film**

Evaporation retarding agent and surface finishing aid for concrete panels.





Technical Services

Mapei offers an extensive range of high quality products specifically designed for the precast concrete market and **local specialised technical support**. **Mapei** is able to provide support for customers including raw material testing, mix design assistance and concrete laboratory trials in support of mix design optimisation programs.



EVERYTHING'S OK WITH MAPEI

Mapei Australia Pty. Ltd.

180 Viking Drive, Wacol QLD 4076

Tel: +61 7 3276 5000

Fax: +61 7 3276 5076

W: mapei.com.au

E: sales@mapei.com.au

