



# Watertight Concrete Solutions

Product guide for waterproofing of deep underground structures





## Contents

3. Watertight concrete solutions
4. Guide for waterproofing of deep underground structures
6. MasterSeal 730 PA / UVS  
Pre-applied HDPE waterproofing membrane
7. MasterSeal M 800 / M 811  
Spray applied elastomeric polymer waterproofing membrane  
MasterSeal 345  
Spray applied waterproofing membrane for tunnel concrete composite shell linings
8. MasterSeal 910S and 911  
System hydroswellable waterbar and hydrophilic swelling mastic system for construction joints
9. MasterSeal 909 and 901  
System re-injectable hose waterstop system with low-viscosity, fast-reacting acrylic resin for construction and cold joints in concrete
10. MasterPel 739  
Water resisting admixture for concrete
11. MasterLife 300D  
Crystalline capillary waterproofing admixture  
Smart Dynamic Concrete



## Watertight concrete solutions

Water is an agent of physical weathering with the most destructive impact on concrete, masonry, steel and stone structures. In fact, it destroys more buildings than wars or natural disasters. Whether above-ground or under, buildings must be able to resist water ingress in the form of rainwater, moisture or hydrostatic pressure. Civil structures partially or completely submerged in water face the greatest corrosion risks due to their constant immersion.

Good water resistance is a key factor ensuring a structure's longevity. Yet, the importance of this facet of structural design is not always given the attention it deserves. Most problems caused by water ingress occur in a relatively small area on the affected structure surface, where design details often meet.

Careful consideration of this issue at design stage can limit cracks, leaks and potentially serious damage over a structure's lifecycle. But this calls for the different trades to work together to implement the design details properly.

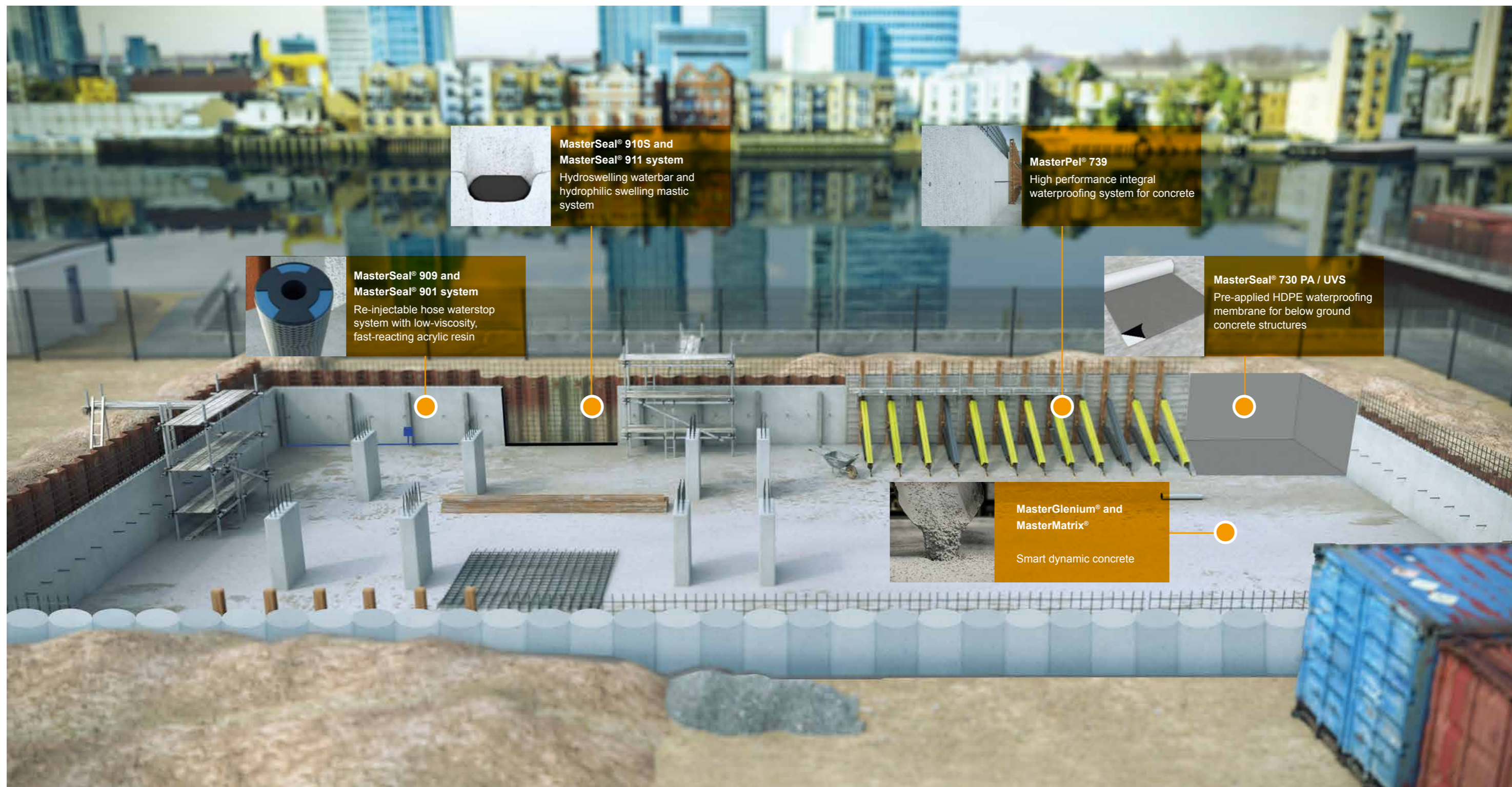
Master Builders Solutions takes a holistic approach to waterproofing, offering solutions for newly-built structures and refurbishment. Given our belief that prevention is better than cure, we address waterproofing solutions, including admixtures for concrete protection, from three perspectives:

- Single source system approach
- Extended life expectancy
- Reduced maintenance and repair costs





# Guide for waterproofing of deep underground structures





## MasterSeal 730 PA / UVS

Pre-applied HDPE waterproofing membrane for below ground concrete structures

### How does it work?

MasterSeal 730 PA / UVS is a pre-applied, HDPE membrane treated with unique pressure sensitive adhesive to enable good adhesion with concrete surfaces. MasterSeal 730 PA / UVS forms a unique integral seal around the concrete poured against it and remains fully adhered to concrete thus retain its performance even there is ground settlement beneath the slabs.

### Recommended for use

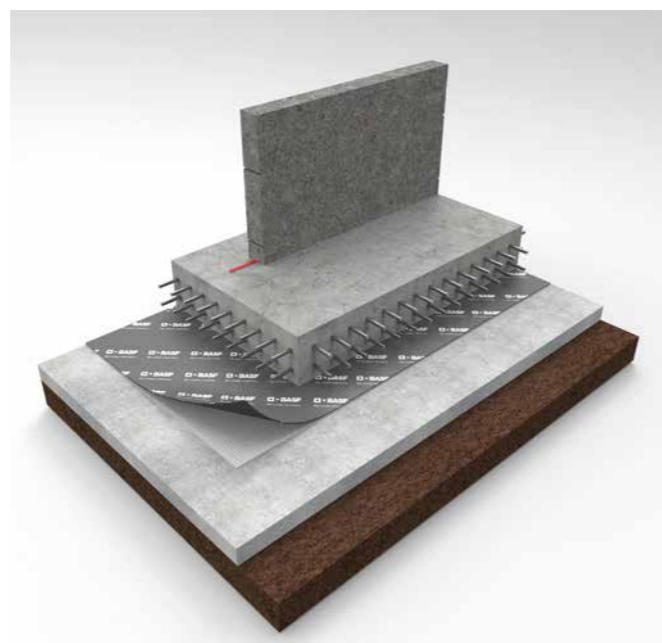
MasterSeal 730 PA / UVS is intended for use in below grade waterproofing applications such as basements with high water table and cut & cover tunneling.



MasterSeal 730 PA / UVS is used with MasterSeal 936 (double side) and MasterSeal 937 (single side) sticky tape detailing at membrane terminations.

### Benefits

- Fully adhered to poured concrete – prevents water migration
- Unaffected by wet conditions – enables application in high water table areas
- Unaffected by contamination – does not require any special protection during construction
- Simply and easy to install – does not require special welding techniques
- Chemically resistant – can be used in all soil and subsoil conditions
- Fully adhered watertight laps - ensures water tightness



\*UVS = Ultraviolet stability grade has an additional feature to resist UV with its silicone-based liner over the basic membrane.



## MasterSeal M 800 / M 811

Spray applied elastomeric polymer waterproofing membrane

### How does it work?

MasterSeal M 800 / M811 is a solvent free, two component waterproofing membrane. It is highly reactive and can only be applied by special, two component spray equipment.

MasterSeal M 800 / M 811 is intended for use in general waterproofing applications such as car park decks, podium decks and cut and cover tunneling. Using the appropriate primer, MasterSeal M 800 / M 811 can be applied to most substrates including concrete, galvanized steel, aluminum, UPVC, glass reinforced polyester etc.



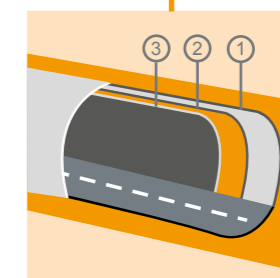
White: MasterSeal 730PA  
Blue: MasterSeal M 800 / M811  
Pink: Protection Board

## MasterSeal 345

Spray applied waterproofing membrane for tunnel concrete composite shell linings

### How does it work?

MasterSeal 345 is an Ethylene-vinyl acetate (EVA) based polymer sprayable membrane for the waterproofing of underground concrete structures. It is spray applied in a sandwich structure between two sprayed concrete / cast concrete layers, creating a double bonded composite shell lining. It is flexible and has very high bond strength properties on both sides of the membrane. It is an effective alternative to conventional waterproofing sheet membranes.



1. Primary concrete lining
2. MasterSeal 345 double-bonded sprayed membrane
3. Secondary concrete lining



## MasterSeal 910S and 911 System

Hydroswelling waterbar and hydrophilic swelling mastic system for construction joints

### How does it work?

MasterSeal 910S is a hydroswelling waterbar, to waterproof joints in concrete structures. It swells in contact with water by up to 200% to prevent water ingress even when joint width varies. Water molecules are held by molecular attraction so that captured water does not get transported through capillaries.

MasterSeal 911 is a one component adhesive used to secure the MasterSeal 910S swelling gasket to all common substrates in construction.

### Benefits

MasterSeal 910S

- No performance change in high salt content water (sea water, brackish water)
- Controlled swelling – minimizes the risk of damage to concrete
- Does not form foam or gas with water – durable seal that prevent leaks
- Outstanding chemical resistance – can be used in chemical storage tanks
- Reversible swelling process – long term performance
- Withstand hydrostatic pressure up to 6 bars – arrests leaks
- 30-day weather exposure – long open time before cast

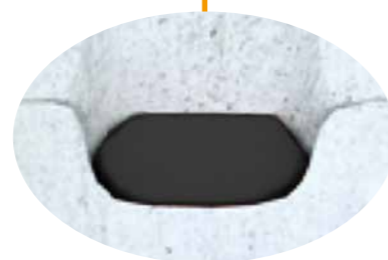
MasterSeal 911

- Adheres the waterbar in place, even on rough surfaces
- Excellent tack on dry and humid surfaces
- Hardened adhesive remains highly flexible in humid and wet environment

### Recommended for use

MasterSeal 910S and MasterSeal 911 is suitable for all underground construction joints (horizontal and vertical joints) like:

- Abutments of rafts and walls in tunnels and basements
- Steel and concrete pipes, H-section, precast elements



## MasterSeal 909 and 901 System

Re-injectable hose waterstop system with low-viscosity, fast-reacting acrylic resin for construction and cold joints in concrete

### How does it work?

MasterSeal 909 is a re-injectable hose waterstop designed to replace a waterbar for use in concrete structures which contain joints and subject to hydrostatic pressure on one or both faces of the structure.

Injected with MasterSeal 901, a solvent-free, water-free, water swelling vinyl ester based injection system that cures to form a flexible yet solid material with an excellent bond to wet substrates.

### Benefits

MasterSeal 909

- Re-injectable hose - arrests leakage caused by settlement or structural movement at the construction joint
- Eliminates costly design, welding and installation of waterbar - time saving and economical
- Water cannot penetrate treated joint and rebar
- Fast and easy installation even to complicated design detail
- Joints can be tested for water tightness before backfilling or membrane tanking operations
- Completely maintenance free

MasterSeal 901

- Injection material is able to travel in micro-cracks, sealing openings
- Unaffected by cycles of swelling and shrinking - continues to perform over long time
- Has a good bond to damp surfaces
- Does not form foam or gas when in contact with water - substrates remain intact. Can withstand continuous high water pressure
- Adjustable reaction time between 20 and 60 minutes

### Recommended for use

MasterSeal 909 and 901 system is useful for structures expected to have movement during their service and prevents water passage through concrete joints (for e.g. water reservoirs, sewage treatment plants, any sub base concrete construction etc.).





## MasterPel 739

Water resisting admixture for concrete

### How does it work?

MasterPel 739 is an innovative, intelligent hydrophobic water-resisting admixture based on nano-chemistry. It uses the free lime to form hydrophobic insoluble salts which line the walls of capillaries by adsorption.

The reduced cohesion forces between the water and concrete surface discourages capillary absorption / suction and prevent the ingress of water.

Effective integral waterproofing needs the full cooperation of the concrete producer, the contractor and the chemical / technology experts, to design the most optimum concrete mix design for superior compaction and impeccable curing process.

### Benefits

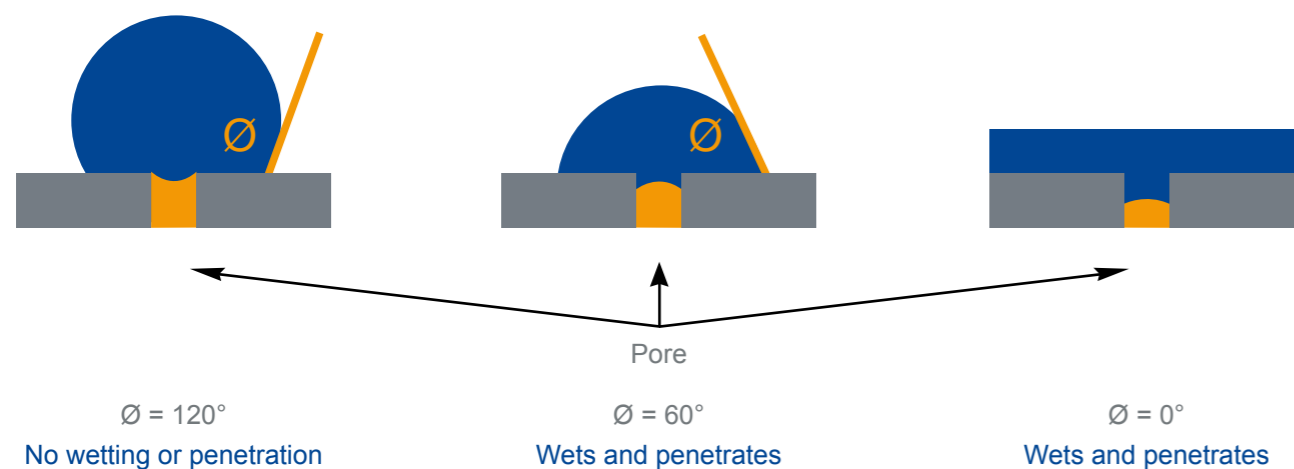
MasterPel 739 is effective:

- Against rain / surface water
- Against pressure heads in structures
- Against water ingress in tidal / splash zones
- In reducing chloride diffusion by preventing build up of absorbed chlorides at surface

### Recommended for use

MasterPel 739 helps to reduce :

- concrete porosity and / or permeability
- alter pores distribution
- suspend their interconnection
- line their walls with hydrophobic substances to reduce capillary absorption / suction



Penetration rate depends upon:  
Surface tension (a liquid property)  
Viscosity (a liquid property)  
Contact angle  $\varnothing$  (an interface property)  
Porosity (of substrate)



## MasterLife 300D

Water resisting admixture for concrete



### Benefits

MasterLife 300D

- Reduces penetration of water and other liquids
- Seals hairline cracks
- Resists positive and negative side hydrostatic pressure
- Protects against sewage and industrial wastes

### How does it work?

MasterLife 300D is an integral crystalline capillary waterproofing admixture for concrete, designed for use in above- and below-grade applications. The unique formulation of ingredients in MasterLife 300D reacts with the by-products of cement hydration in concrete to form non-soluble crystalline structures in capillary pores.

The reaction between water and the calcium hydroxide in the hydrating cement form calcium silicate hydrates and pore blocking precipitates. This effectively seals capillaries as well as heals hairline cracks after the concrete has passed the plastic state, allowing concrete to breathe.

### Recommended for use

MasterLife 300D is recommended for structures where waterproofing is required, such as in carpark roofs, below grade basement structures, foundations, lift pits, podium decks, terraces, balconies, rooftops, facades, water and liquid retaining structures, substations, precast concrete, tunnels, and subway systems etc.



## Smart Dynamic Concrete

### Concept

Smart Dynamic Concrete is suitable to upgrade high slump concretes to a higher performance level with self-compacting characteristics and is as easy to produce as standard concrete.

It allows the ready-mix industry to reach better construction process economy, higher concrete durability and increased energy efficiency in order to save time and money and reduce CO<sub>2</sub> emissions. MasterMatrix is the essential component of the Smart Dynamic Concrete concept. It consists of a water-soluble polymer which modifies the rheological properties of the concrete mix.



When used in conjunction with one of our MasterGlenium products, MasterMatrix brings a level of viscosity to the mix that allows the right balance between fluidity, passing ability and resistance to segregation opposing properties to be achieved. Thus enabling the production of a self-consolidating concrete.

## Master Builders Solutions

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### Master Builders Solutions

The Master Builders Solutions brand brings all of its expertise together to create chemical solutions for new construction, maintenance, repair and renovation of structures. Master Builders Solutions is built on the experience gained from more than a century in the construction industry. The know-how and experience of a global community of Master Builders Solutions construction experts form the core of Master Builders Solutions. We combine the right elements from our portfolio to solve your specific construction challenges. We collaborate across areas of expertise and regions and draw on the experience gained from countless construction projects worldwide. We leverage global Master Builders Solutions technologies, as well as our in-depth knowledge of local building needs, to develop innovations that help make you more successful and drive sustainable construction.

### Our Comprehensive Portfolio

- Concrete Admixtures
- Cement Additives
- Chemical Solutions for Underground Construction
- Waterproofing Solutions
- Sealants
- Concrete Repair and Protection Solutions
- Performance Grouts
- Performance Flooring Solutions

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