MASTER® BUILDERS SOLUTIONS

MasterLife® 300D

Integral waterproofing admixture for concrete

BASF
We create chemistry

MasterLife 300D integral waterproofing admixture for concrete

History

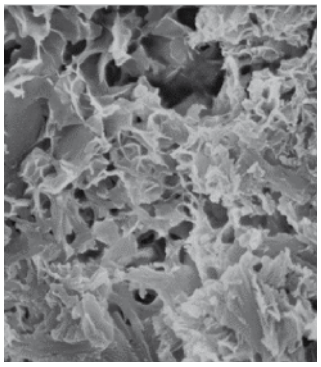
Water can pass through untreated concrete due to the mechanisms of capillary absorption and hydrostatic pressure.

Admixtures have been used for concrete waterproofing in Australia since the late 1950's. The use of this crystalline technology that has an affinity to water (hydrophilic) and when set in concrete repels water (hydrophobic) has become well accepted.

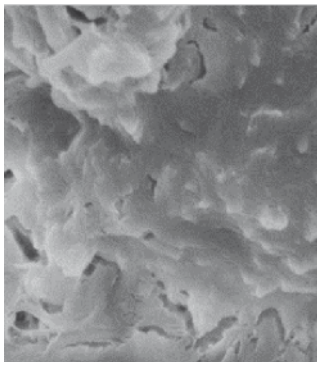
Crystalline technology was originally developed as a waterproofing admixture for pre-mixed concrete and has evolved into a durability enhancing admixture due to its technical performance.

How it works

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 is with the water and the calcium hydroxide in the hydrating cement to form calcium silicate hydrates and migratory pore blocking precipitates. This effectively seals capillaries and heals hairline cracks to 0.4mm after the concrete has passed the plastic state. Interestingly, it allows concrete to breathe. Treated concrete resists positive and negative side hydrostatic pressure.



Concrete without MasterLife 300D



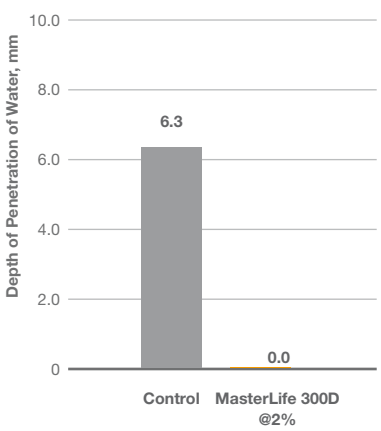
Densification of voids in concrete treated with MasterLife 300D

MasterLife 300D offers a solution to many issues related to the deterioration of concrete structures. These include reduced permeability, reduced chloride ingress, possible containment or conversion of chlorides through on-going reactions, resistance to carbonation, and protection against many other key forms of concrete attack.

Test results show capillary absorption is reduced by 43 per cent, water penetration is reduced by 40 per cent and compressive strength is increased by 7 per cent compared to untreated concrete mixes.

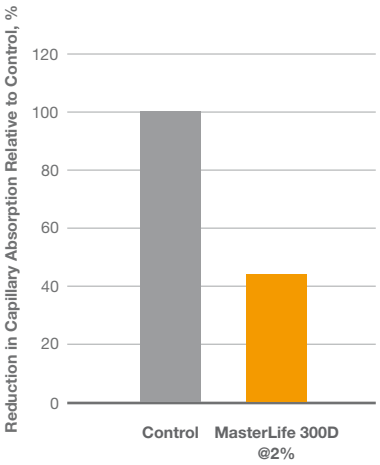
MasterLife 300D is a permeability reducing admixture for concretes exposed to hydrostatic conditions (PRAH) as classified in ACI 212.3R-16.

Water penetration – DIN 1048 part 5 (mm)



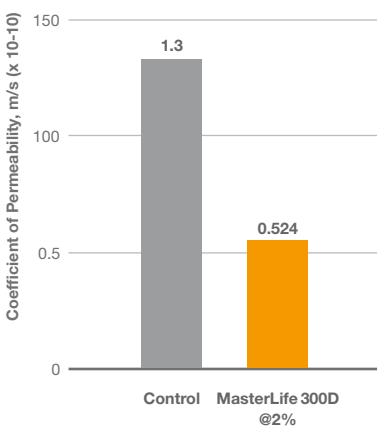
Water Penetration – DIN 1048 Part 5 (mm)

ASTM C 1585 capillary absorption



Capillary Absorption – ASTM C 1585 (%)

Water penetration - CRD C48 independent testing



Water Permeability of Concrete – CRD C48, 13.78 bar of head pressure (m/s)

Why use MasterLife 300D for waterproofing/ watertightness?

The definition of waterproof is that a material is impervious to water, in either a liquid or vapour state. Strictly speaking, “watertight” is a better term because nothing can be completely impervious to water under infinite pressure over infinite time. To further complicate matters, the industry refers to crystalline admixture technology as waterproof.

The MasterLife 300D crystalline technology significantly reduces water penetration into concrete. Where waterproof structures are required such as in carpark roofs or below grade basement structures, it is recommended that MasterLife 300D be used in the concrete. In addition, the BASF MasterSeal® range of engineered waterproofing solutions should be used to create a barrier against water ingress.

For watertight concrete, MasterLife 300D is the best solution because it offers a long term solution, reduces construction time, cannot be damaged by onsite trades, and provides cost savings.

Areas of use include foundations, basements, lift pits, podium decks, terraces, balconies, rooftops, facades, water and liquid retaining structures, substations, parking structures, precast concrete, tunnels, and subway systems.

Why use MasterLife 300D for durability?

The voids and capillaries for water ingress become sealed, eliminating or delaying corrosion initiation. The reactive technology ensures long-term crack protection, which also protects against corrosion. MasterLife 300D hinders the intrusion of chlorides and other aggressive materials thereby protecting steel reinforcement.

Asset owners can expect increased service life and lower maintenance costs when concrete has been treated with MasterLife 300D.

Areas of use include water treatment infrastructure such as sewage treatment plants, water reservoirs, tanks for potable water, dams, bridges, culverts, chemical factories, food processing facilities and anywhere concrete is exposed to wet, harsh and aggressive environments. Large and small projects benefit from MasterLife 300D. Bricklayers and concreters can obtain pails from Master Builders Solutions distributors for use in mortars and concrete.

MasterLife 300D used in over 400 projects

MasterLife 300D has been specified and successfully used in over 400 projects including 175 water/waste water plants in the US and Canada.

Where and how can failure occur?

Structures must be designed with particular consideration given to minimise cracking and cracking tolerances. Concrete must be placed in accordance to the Australian Standard AS 3600-2009. Particular attention must be given to vibration. Newly placed concrete must be protected from the elements such as wind and sun and cured correctly.

Crack tolerances and design

Designers can refer to the following Australian, American and European Standards;

- AS 3600-2009 Concrete structures
- AS 3735-2001 Concrete structures retaining liquids
- ACI 350-06 Code requirements for environmental engineering concrete structures
- ACI 350-5-12 Specifications for environmental concrete structures
- ACI 318-14 Building code requirements for structural concrete and commentary
- BS EN 1992-1-1 2004 Eurocode 2. Design of concrete structures
- BS 8102:2009 Code of practice for protection of below ground structures against water from the ground
- BS EN 1992-3:2006 Eurocode 2. Design of concrete structures. Liquid and retaining and containing structures.

Concrete placement

Vibration or compaction is the principal method of concrete consolidation. Fresh concrete must be properly vibrated so that once hardened its strength and durability are fully realised. Reduced density due to under-consolidation can result in increased permeability and consequently less resistance to deterioration.

Concrete must be placed in accordance with Section 17 Materials & Construction Requirements in AS 3600 – 2009 Concrete structures. Also refer to Concrete Institute of Australia CPN 33 December 2002:Compaction of Concrete Using Immersion and Surface Vibrators.

Concrete protection and curing

Freshly placed concrete must be protected from the effects of rain, running water and freezing or drying prior to hardening. Early care and protection must be taken to avoid cracking within the first few hours of placement. In adverse conditions, apply evaporation retardants such as MasterKure® 111 immediately after screeding and bull floating, and reapply as required.

Curing improves the compressive strength, flexural strength and abrasion resistance. It also reduces porosity, ensures low permeability and enhances resistance to reinforcement corrosion by improving the quality of the concrete in the cover zone.

Concrete must be cured continuously for a period of time so the design requirements for strength, serviceability and stripping are satisfied.

Application of curing compounds such as MasterKure 250, MasterKure 402 and MasterKure 404 are recommended, and must be used in accordance with AS 3799-1998 Liquid membrane-forming curing compounds for concrete.

Quality Assurance (QA) procedure

It is good QA process to have materials signed for when delivered to site, and to have batch codes recorded from MasterLife 300D pails in addition to premix concrete batch records.

MasterLife 300D successful structures

Successful structures

Experience has shown that teamwork is vital to manage concrete cracking. The engineer, builder, concrete supplier, concrete placer and BASF representative should hold a pre-pour meeting to review the project and document the part that each organisation plays in creating a concrete structure that conforms to expectations.

Of course, the meeting could also include the architect, asset owner, concrete curing contractor, post tensioned designer/installer. The BASF project warranty is dependent upon this meeting being held, followed by a post-pour inspection within three days of the pour.

Our tips for success

1. Tight, practical, performance based professional specifications
2. Project specific specification – if required
3. QA procedures included in all specifications
4. Inspection stop points included in specifications
5. Collaborative pre-pour meetings on all projects

BASF has the expertise to assist the construction industry for successful outcomes. We offer advice at no cost, so why not contact your BASF office today to start work on your project.

MasterLife 300D used in over 400 projects

MasterLife 300D has been specified and successfully used in over 400 projects, including 175 water or wastewater plants in North America and Canada.
In Australia, MasterLife 300D has recently been used at Bluescope steel works in Port Kembla, at Manildra Group on a food processing floor, and in medium density apartment developments.

MasterLife 300D dosage

MasterLife 300D dosage

Each 20kg pail of MasterLife 300D contains five bags of product. Each bag contains four kilograms of formulation. The bag is dissolvable. The dosage of MasterLife 300D is 2 per cent by weight of cementitious content per cubic metre. This includes cement, flyash, slag and silica fume. For other materials, consult BASF.

Consult the MasterLife 300D dosage chart available from BASF website, app or sales team, to identify the number of bags for the concrete truck load size and cementitious content.

Add the number of MasterLife 300D bags upfront to the mixer before any cement and aggregates. Agitating/mixing should occur for five minutes to ensure that the bags have dissolved and the contents have dispersed.

Non-chloride, non-corrosive

MasterLife 300D admixture will neither initiate nor promote corrosion of reinforcing or pre-stressing steel embedded in concrete or of galvanised steel floor and roof systems. Neither calcium chloride nor other chloride-based ingredients are used in the manufacture of MasterLife 300D.

Compatibility

MasterLife 300D admixture can be used with Portland cements approved under Australian and New Zealand standards. It is compatible with most concrete admixtures, such as the MasterGlenium® series, for maximum workability while maintaining a low water/binder ratio.

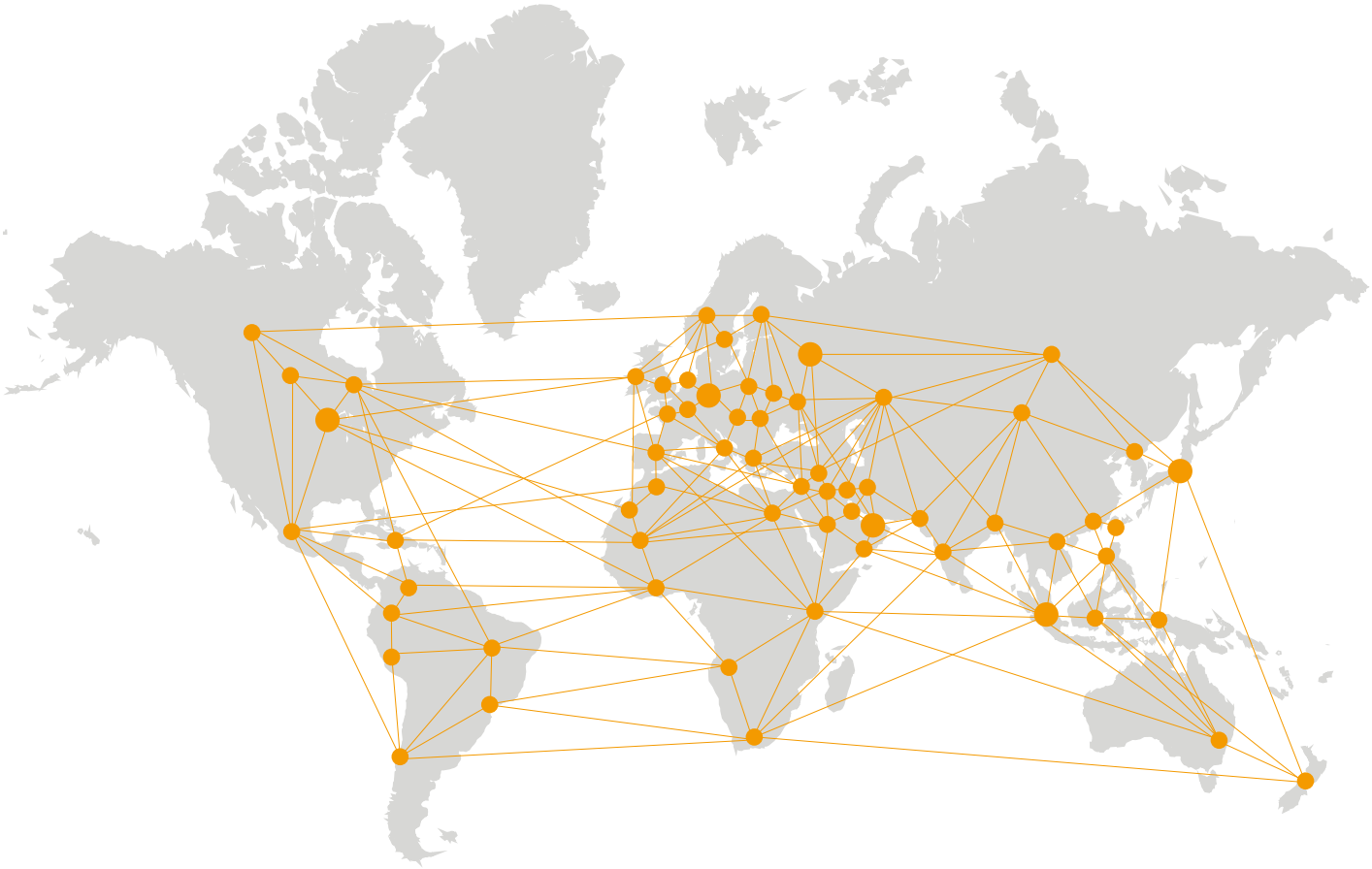
Master Builders Solutions by BASF

Master Builders Solutions

The Master Builders Solutions brand brings all of BASF's 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 BASF 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 world -wide. We leverage global BASF 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



Master Builders Solutions from BASF for the construction industry

MasterAir®
Complete solutions for air entrained concrete

MasterBrace®
Solutions for concrete strengthening

MasterCast®
Solutions for the manufactured concrete product industry

MasterCem®
Solutions for cement manufacture

MasterEase®
Low viscosity for high performance concrete

MasterEmaco®
Solutions for concrete repair

MasterFinish®
Solutions for formwork treatment and surface improvement

MasterFlow®
Solutions for precision grouting

MasterFiber®
Comprehensive solutions for fiber reinforced concrete

MasterGlenium®
Solutions for high performance concrete

MasterInject®
Solutions for concrete injection

MasterKure®
Solutions for concrete curing

MasterLife®
Solutions for enhanced durability

MasterMatrix®
Advanced rheology control for concrete

MasterPel®
Solutions for water tight concrete

MasterPolyheed®
Solutions for mid-range concrete

MasterPozzolith®
Solutions for water-reduced concrete

MasterProtect®
Solutions for concrete protection

MasterRheobuild®
Solutions for high strength concrete

MasterRoc®
Solutions for underground construction

MasterSeal®
Solutions for waterproofing and sealing

MasterSet®
Solutions for set control

MasterSure®
Solutions for extraordinary workability retention

MasterTop®
Solutions for industrial and commercial floors

Master X-Seed®
Advanced accelerator solutions for concrete

Ucrete®
Flooring solutions for harsh environments

Australia

1300 227 300 (1300 BASF 00)

www.master-builders-solutions.basf.com.au

New Zealand

0800 334 877

www.master-builders-solutions.basf.co.nz

W537776 07.2016