

Product in Focus

**MasterLife[®] 300 Series Crystalline Capillary
Waterproofing Admixtures**

For Producing Watertight
Concrete Structures

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MasterLife® 300 Series Crystalline Capillary Waterproofing Admixtures

Achieving Watertight Concrete

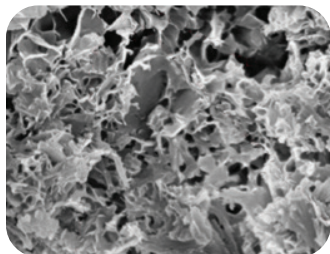
Strategies to help achieve watertight concrete include proper construction practices, and the use of a water-reducing admixture, supplementary cementitious materials, and a permeability-reducing admixture (PRA), each working in concert to lower concrete permeability, thereby improving its watertightness. MasterLife 300 Series, integral, crystalline-based, permeability-reducing admixtures are a key component for producing durable, watertight concrete. The MasterLife Series of admixtures consist of MasterLife 300D, MasterLife 300C and MasterLife 300L admixtures.

The Role of MasterLife 300 Series Admixtures in Watertight Concrete

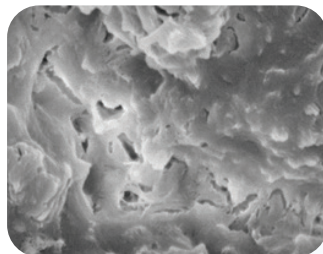
MasterLife 300 Series admixtures are uniquely formulated to react in concrete, in the presence of moisture, to form additional calcium silicate hydrate gel and insoluble crystalline products that fill fine pores and seal hairline cracks in concrete. Concrete structures containing MasterLife 300 Series admixtures will have reduced penetration of water and other liquids, enhanced resistance to hydrostatic pressure, and protection against sewage and industrial wastes*.

Concrete at 40,000x Magnification

The following images captured with a scanning electron microscope (SEM) compare concrete microstructure with and without the use of MasterLife 300D admixture.



This image shows a typical concrete microstructure containing a high number of capillary pores represented by the darker shaded areas.



The capillary pore-filling and crack-sealing ability of MasterLife 300D admixture results in minimized permeability (note the reduced amount of darker shaded areas).

Quantifying Performance

The penetration of water into concrete can be measured by the commonly specified DIN 1048 water penetration test method [DIN 1048, Part 5 – Testing Concrete: Testing of Hardened Concrete (specimens prepared in mould)].

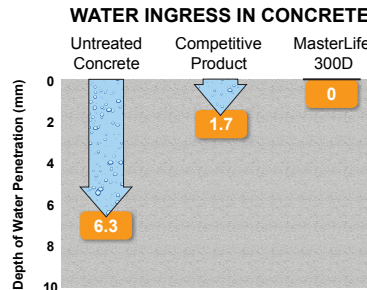


Figure 2. Independent DIN 1048 Data

As shown in Figure 2, water penetration into the concrete sample treated with MasterLife 300D admixture could not be measured.

The figure at left shows the results of independent testing conducted on various concrete samples of identical mixture proportions using the DIN 1048 test, extended to 96 hours.

Concrete Permeability

Concrete is a porous and absorptive material susceptible to cracking. It contains pores and microcracks that when interconnected become pathways for movement of water (referred to as its permeability) as illustrated in Figure 1.



Figure 1.



Sarasota Memorial Hospital, Sarasota, FL

Applications

MasterLife 300 Series of admixtures have been used or specified for use in hundreds of structures requiring waterproofing, including precast elements, water treatment plants, wastewater treatment facilities, recreation ponds, swimming pools and other above- and below-grade concrete structures.

Sustainability

Today's demands for high-quality, long lasting structures include the need for more sustainable concrete solutions to reduce environmental impacts. We support our customers by quantifying the environmental impacts of concrete mixtures containing MasterLife 300 Series admixtures using science-based, third-party verified Eco-Efficiency Analyses and Environmental Product Declarations.

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