

Catalyst Technology for Increasing the Durability of Concrete

Benjamin Ramsay¹

¹ VULK

One of the main issues in building structures is the durability of concrete, which is significantly affected by shrinkage micro cracks and reduced density of the concrete upper layer.

The main cause of concrete shrinkage is excess water, which is not involved in the hydration process, but is necessary for concrete placement. Excess water remains even when high-range water reducers are used.

Imbalances in the water/cement ratio leads to shrinkage microcracks and increased porosity of concrete, most extensively at the exposed upper layer, which dramatically reduces the strength and durability characteristics.

The use of relatively costly shrinkage reducing admixtures generally only delays shrinkage cracking over time. Other methods for reducing shrinkage cracking include expanding shrinkage compensating admixtures for conventional concrete, but these are impractical for technological and economic reasons and only applicable to special concrete and mortars.

Thus, conventional concrete production for the most part, is initially produced with reduced durability, strength and performance characteristics and therefore is inherently partially incomplete.

To improve concrete production, a method has been developed that does not have these disadvantages. The function of the method is to use the internal reserves of the cement stone of concrete to enable self-healing of shrinkage micro cracks and increase the density of the upper layer of concrete. This is achieved by initiating "secondary hydration" in the cement stone by treating the surface layer with a special Aardcure Catalyst hydration activator.

As a result, the durability of concrete increases dramatically and its strength and performance characteristics improve.