

MasterSet[®] DELVO

Admixture Technology

Stabilization of Returned Plastic Concrete

Description

The discussion below pertains to the application of MasterSet DELVO admixture technology for same day and overnight stabilization of returned plastic concrete.

Overview

The disposal of returned plastic concrete has become a challenge for the ready-mixed concrete industry. Conventional methods for the disposal of returned plastic concrete include:

- Being sold as part of the next load
- Paving the ready-mix plant yard
- Producing concrete products (barrier blocks, manhole covers, etc.)
- Using reclaimer/recycler units
- Dumping the returned concrete

The challenge of returned concrete also increases environmental concerns throughout the industry. Many ready-mix concrete producers have sought a cost-effective solution to this problem. The solution is MasterSet DELVO admixture technology.

MasterSet DELVO Admixture Technology

MasterSet DELVO admixture technology provides a unique, cost-effective alternative to the disposal of returned plastic concrete.

MasterSet DELVO admixture, when dispensed into plastic concrete, stops cement hydration by forming a protective barrier around cementitious particles. This barrier prevents portland cement, fly ash, and granulated slag from achieving initial set. Returned plastic concrete treated with MasterSet DELVO admixture can be kept in a plastic state in the drum of a ready-mix truck or in a central holding vessel for a few minutes, a few hours, or longer.

Treating Returned Plastic Concrete

MasterSet DELVO admixture provides the following benefits:

- Reduces the use of reclaimer/recycler units and associated maintenance costs
- Reduces dumping of returned concrete which can result in expensive labor costs, excessive wear and tear on front-end loaders and costly hauling charges
- Reduces environmental (EPA) concerns pertaining to the disposal of returned plastic concrete
- Concrete treated with MasterSet DELVO admixture technology results in superior performance qualities

Dosage Requirements

The specific dosage for a given concrete mixture depends on the chemical admixtures, concrete materials and mix designs used, the elapsed time from initial batching, the returned plastic concrete temperature, the quantity of concrete being treated, and the stabilization time required.

Concrete treated with MasterSet DELVO admixture is combined with fresh concrete either the same day, or the next day. If weather conditions or scheduling challenges do not permit the use of the ready-mix truck containing stabilized concrete, it may be restabilized once before being used.

Stabilization Procedure (Same day, or overnight)

The procedure for same day and overnight stabilization of returned plastic concrete is easy, and it is important that each step be correctly followed.

1. From the batch ticket, identify the mix design, admixtures used and the initial batch time of the returned concrete.
2. Determine the quantity (cubic yards / cubic meters) of returned concrete.
3. Add enough cold water to the returned concrete to obtain the desired slump. Mix the concrete for 1 minute at the normal mixing speed.

Note: The desired slump range for sameday stabilization is 5 to 7 in. (125 to 175 mm).

4. Measure and record the concrete temperature.
5. Determine the total amount of cement per cubic yard (cubic meter) corresponding to the mix design of the returned concrete.
6. Determine the total MasterSet DELVO admixture dosage in fluid ounces per cubic yard (milliliters per cubic meter) from the appropriate MasterSet DELVO dosage chart.
7. Calculate the total MasterSet DELVO dosage in fluid ounces (milliliters) to be dispensed into the returned concrete.
8. Dispense the required amount of MasterSet DELVO admixture into the returned concrete and record the time it was stabilized.

Note: When stabilizing returned plastic concrete for a few minutes or several hours (same day stabilization), in most cases, an accelerator is not needed. At this point, batch fresh concrete on top of the stabilized concrete. The minimum amount of fresh concrete to be batched on top is based on a ratio of 1:1.

9. After mixing the stabilized concrete for 5 to 7 minutes, park the truck and turn it off.

Notes: In very dry and windy conditions, parking the truck with the cab into the wind will reduce surface evaporation. The drum safety hatch should be located in the 3 or 9 o'clock position.

Activation Procedure (Overnight)

1. Mix the stabilized concrete at agitation speed (6 to 8 rpm) for 1 minute.

Note: When subjected to ambient temperatures below freezing, the stabilized concrete may freeze. If this occurs, back the truck underneath the batch plant and add 5 to 25 gallons (20 to 95 liters) of hot water to melt the frozen material before mixing at agitation speed (6 to 8 rpm) for 3 minutes.

To prevent the freezing of stabilized concrete, transfer the concrete into one or more ready-mix trucks parked indoors, into a central holding vessel kept indoors or implement the use of water heaters.

2. Determine and record the concrete temperature.
3. Determine the accelerator I dosage using the appropriate accelerated dosage chart and record the total accelerator dosage in fluid ounces (milliliters).
4. Dispense the required amount of accelerator into the stabilized concrete.
5. Record the time the stabilized concrete was activated.
6. Mix the activated concrete for 5 to 7 minutes at the normal mixing speed.

¹ MasterSet AC 122, MasterSet FP 20, MasterSet AC 534 admixtures can be used. The proper dosage must be verified by a Master Builders Solutions sales representative.

7. Batch fresh concrete on top of the activated concrete contained in each ready-mix truck at a 2:1 ratio (fresh concrete: stabilized concrete). This must be done within 1 hour after activating the stabilized concrete.
8. Record the quantity (cubic yards or cubic meters) of fresh concrete batched and the mix design used.

Note: When batching fresh concrete on top of concrete treated with MasterSet DELVO admixture, the water content for each cubic yard (cubic meter) of fresh concrete should be reduced to compensate for the additional water added the previous day.

About Master Builders Solutions

Master Builders Solutions is a leading global manufacturer of concrete admixtures, as well as other sustainable solutions for the construction industry, focussed on delivering its vision: **Inspiring people to build better**. Master Builders Solutions provides value-added technology and market-leading R&D capabilities to improve the performance of construction materials and to enable the reduction of CO₂ emissions in the production of concrete. Founded in 1909, Master Builders Solutions has ca. 1600 employees operating 35 production sites globally, supporting their customers in mastering their building challenges of today – for a decarbonised future.

Master Builders Solutions Admixtures US, LLC

23700 Chagrin Boulevard
Beachwood, OH 44122 USA
(800)628-9990

Master Builders Solutions Canada, Inc

1800 Clark Boulevard
Brampton, Ontario L6T 4M7 CANADA
(289) 360-1300

master-builders-solutions.com/en-us
admixtures@masterbuilders.com

LIMITED WARRANTY NOTICE: We warrant our products to be of good quality and will replace or, at our discretion, refund the purchase price of any products proved defective. Satisfactory results depend not only upon quality products, but also upon many factors beyond our control. Therefore, except for such replacement or refund, MASTER BUILDERS SOLUTIONS MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, RESPECTING ITS PRODUCTS, and Master Builders Solutions shall have no other liability with respect thereto. Any claims regarding product defect must be received in writing within one (1) year from the date of shipment. User shall determine the suitability of the products for the intended use and assume all risks and liability in connection therewith. Any authorized change in the printed recommendations concerning the use of our products must bear the signature of the Master Builders Solutions Technical Manager.

This information and all further technical advice are based on Master Builders Solutions' present knowledge and experience. However, Master Builders Solutions assumes no liability for providing such information and advice including the extent to which such information and advice may relate to existing third party intellectual property rights, especially patent rights. MASTER BUILDERS SOLUTIONS SHALL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, INDIRECT OR INCIDENTAL DAMAGES (INCLUDING LOSS OF PROFITS) OF ANY KIND. Master Builders Solutions reserves the right to make any changes according to technological progress or further developments.