



Product in Focus

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 accelerator¹ 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.
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.

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.

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.

More Information

The Master Builders Solutions brand brings expertise 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 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 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.

The comprehensive portfolio under the Master Builders Solutions brand encompasses concrete admixtures, cement additives, chemical solutions for underground construction, fiber reinforcement solutions, waterproofing solutions, sealants, concrete repair & protection solutions, performance grouts, and performance flooring solutions.

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