

DELVO[®] System Application: Stabilisation of concrete wash water

NOTE: The discussion below describes one application of the DELVO[®] System: overnight / weekend stabilisation of concrete wash water. Additional applications of the DELVO[®] System are outlined in the DELVO[®] System Information Sheet.

Overview

At the end of each day, when a 7.0 cubic metre ready-mix truck returns to the plant with no leftover concrete, that truck will contain approximately 350 kg of cement, fine aggregate and coarse aggregate adhering to the inside of the truck drum. It is a common practice in the ready-mixed concrete industry to wash this residue out using approximately 600 to 2000 litres of water to thoroughly clean the inside of the drum. Conventional methods for the disposal of concrete wash water include dumping:

- **At the jobsite**
- **At a landfill**
- **Into a reclaimer / recycler unit**
- **Into a concrete wash water pit**
- **In the ready-mix plant yard**

The removal of hardened residual wash-out can result in expensive labour costs, excessive wear and tear on front-end loaders, and costly hauling charges. Some environmental protection agencies consider concrete wash water to be a hazardous material and regulate its disposal. Ready-mix producers could easily comply with these regulations if they had a cost-effective solution to the problem.

DELVO[®] System

BASF has pioneered the use of a new and unique, cost-effective alternative to the disposal of concrete wash water by developing the DELVO[®] System.

The DELVO[®] System is a two-component, non-chloride chemical system originally developed to control the dynamics of concrete setting time through the process known as pre-manufacturing concrete.

Pre-manufacturing concrete is the process by which returned plastic concrete treated with the DELVO[®] System can be kept in a plastic state in the drum of a ready-mix truck or in a central holding vessel for a few hours, overnight or over a weekend. On the same day, the next day or after a weekend, the pre-manufactured concrete is combined with freshly manufactured concrete and sent to the jobsite.

The DELVO[®] Stabiliser, when dispensed into plastic concrete containing an BASF admixture or admixture system, stops cement hydration by forming a protective barrier around cementitious particles. This barrier prevents Portland cement, micro silica and fly ash from achieving initial set. The DELVO[®] Activator, when dispensed into stabilised concrete, counteracts the protective barrier around cementitious particles and allows cement hydration to proceed normally.

Treating concrete wash water

The DELVO[®] Stabiliser can be used to stabilise concrete wash water in the drum of a ready-mix truck, on an overnight and weekend basis, and provides the following benefits:

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- Reduces the amount of water needed to clean ready-mix truck drums.
- Reduces the labour costs of washing out trucks.
- Eliminates concrete wash water disposal.
- Eliminates the need for concrete wash water pits, the resulting wear and tear on front-end loaders, and hauling charges.
- Acts as a cleansing agent to reduce concrete build-up on mixing blades, thereby reducing maintenance costs incurred from chipping out hardened concrete.
- Concrete containing stabilised wash water will experience strength performance equal to or greater than reference concrete without stabilised wash water.
- Reduces / eliminates environmental concerns relating to the disposal of concrete wash water.

For overnight stabilisation of concrete wash water, use 1000 to 2000 ml of DELVO[®] Stabiliser per truck. For weekend stabilisation, 2000 to 3000 ml of DELVO[®] Stabiliser per truck.

When using Type III cement, use 1400 to 2400ml of DELVO[®] Stabiliser per truck for overnight stabilisation of concrete wash water, and 2400 to 3300 ml per truck for weekend stabilisation.

The stabilised concrete wash water is reused as mix water in the subsequent manufactured concrete either the next day or after a weekend. If weather conditions or scheduling problems **do not** permit the use of a ready-mix truck containing stabilised concrete wash water either the next day or after a weekend, the concrete wash water may

be re-stabilised **once** before being used as mix water the following day.

Note:

When subjected to ambient temperatures below freezing, the stabilised concrete wash water may freeze. If this occurs, add hot water to the truck and mix at agitation speed to melt the frozen material. The transfer of stabilised concrete wash water into one or more ready-mix trucks parked indoors, into a central holding vessel kept indoors or the use of water heaters will prevent the freezing of stabilised concrete wash water.

The stabilised concrete wash water is reused as mix water in the subsequent freshly manufactured concrete.

Stabilisation procedure

The procedure for overnight / weekend stabilisation of concrete wash water is easy, but it is important that each step be correctly followed.

1. The ready-mix truck should be empty of any returned concrete. Add 120 to 250 litres of water to the truck drum.
2. Back up the concrete wash water to the rear of the truck drum..
3. Dispense 1000 to 2000 ml of DELVO[®] Stabiliser into concrete wash water for overnight stabilisation. For weekend stabilisation, dispense 2000 to 3000 ml into the concrete wash water. Safety glasses or goggles and rubber gloves must be worn when handling the DELVO[®] Stabiliser.
4. Return the stabilised concrete wash water to the front of the drum and mix at high speed for 1 minute.

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5. Back up the stabilised concrete wash water quickly to the rear of the drum for maximum fin cleaning
6. Return the stabilised concrete wash water to the front of the drum and mix at high speed for 1 minute. Park the truck for the night or weekend.
7. The next day or after a weekend, reduce the water content of the freshly manufactured concrete by the amount of water added in step No. 1.

Packaging

The DELVO[®] Stabiliser is supplied in 210 litre drums

Temperature precaution

Store the DELVO[®] Stabiliser at 1°C or above. If the DELVO[®] Stabiliser has frozen, thaw at 1°C or above and completely reconstitute by mild mechanical agitation. DO NOT use pressurised air for agitation.

Safety precautions

In case the DELVO[®] Stabiliser comes into contact with eyes, skin or clothing, immediately flush with water (for skin, wash with soap and water) for 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Do not take internally. Keep product away from children at all times.

Concrete technology innovation

The development of the DELVO[®] System is a technological breakthrough in the concrete industry. It is a cost-effective alternative to the disposal of returned plastic concrete and concrete wash water. Through its numerous applications, the DELVO[®] System will allow ready-mix producers to more efficiently utilise their concrete materials on a daily basis.

For additional information on the various DELVO[®] System applications, contact your local BASF representative.

Note

Field service, where provided, does not constitute supervisory responsibility. For additional information contact your local BASF representative.

BASF reserves the right to have the true cause of any difficulty determined by accepted test methods.

Quality and care

All products originating from BASF's Dubai, UAE facility are manufactured under a management system independently certified to conform to the requirements of the quality, environmental and occupational health & safety standards ISO 9001, ISO 14001 and OHSAS 18001.

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