

Concrete Producers

Central Concrete Supply Company, Inc. and Right Away Redy Mix, Inc. (Northern California business units of U.S. Concrete, Inc.)

Product Used

MasterSet® DELVO Hydration-Controlling Admixture from BASF Corporation

Market Sector

Ready-mixed concrete

Solution Profile

Treating Returned Fresh Concrete

Improving Job Site Productivity While Reducing Waste



The Background

At times, a project does not require quite as much concrete as was originally expected. As a result, ready-mixed concrete producers are left with varying amounts of fresh concrete for disposal. Central Concrete Supply Company and Right Away Redy Mix were interested in finding a solution that would allow them to reuse this fresh concrete, thereby eliminating its disposal, and hence the wastage. In addition, this solution needed to deliver equal or better performance.

Improving Job Site Productivity While Reducing Waste

The Challenges

- Varying degrees of concrete may be left over after a job.
- Ready-mixed concrete producers are seeking ways to reuse the returned fresh concrete to reduce waste, improve job productivity and achieve equal or better performance.

Industry Expectations

The desire to reuse returned fresh concrete has also been bolstered by Caltrans' specification that permits this practice and was validated with the development of ASTM C1798, "Standard Specification for Returned Concrete for Use in a New Batch of Ready-Mixed Concrete." This ASTM specification outlines all the processes, verification requirements and recording procedures to ensure the highest levels of quality of returned fresh concrete.

In addition, per California Assembly Bill AB 2355, local governments that have jurisdiction over a street or highway are required to either adopt the standards developed by the Department of Transportation for recycled paving materials and for recycled base, subbase, and pervious backfill materials, or discuss why they are not adopting those standards at public hearings.

As a result, municipalities, developers and the Architecture, Engineering, and Construction (AEC) community are demanding solutions that meet the following requirements, without compromising performance:

- Reduce waste and conserve their landfills
- Decrease fleet trips and associated gas emissions
- Conserve natural resources
- Meet environment standards set forth by their respective communities

The Solution

To meet the needs of the concrete producers, BASF Corporation recommended the use of MasterSet DELVO hydration-controlling admixture. This innovative admixture was the first such product designed to control the hydration of portland cement and supplementary cementitious materials (fly ash, silica fume, metakaolin and slag cement). This product has been widely used to preserve the freshness of concrete for long hauls — keeping the returned concrete "plastic" through a process called "Same-Day Stabilization" — and to treat concrete washwater.

By using MasterSet DELVO admixture, and adopting the guidelines provided in ASTM C1798, Central Concrete Supply Company and Right Away Redy Mix are now able to reuse returned fresh concrete in producing consistent, highly constructible concrete mixtures that meet or exceed the performance specifications set forth.

MasterSet DELVO Admixture: A Closer Look

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

Performance Benefits

As shown in Figure 1, concrete mixtures developed in accordance with ASTM C1798, containing returned fresh concrete treated with MasterSet DELVO admixture technology, achieved better performance relative to target design strengths. The chart further identifies the performance data for typical applications, such as sidewalks, curb and gutter, flatwork and foundations developed by Central Concrete Supply Company and Right Away Redy Mix.

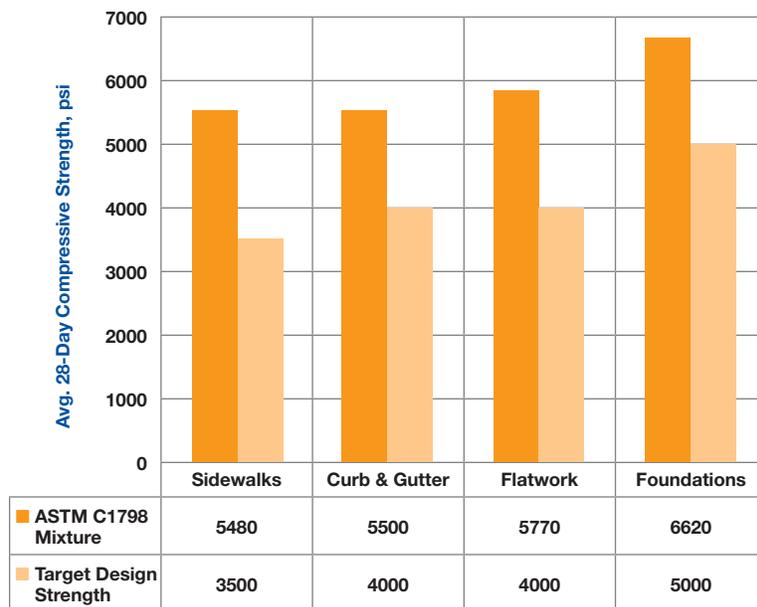


Figure 1 – Average 28-Day Compressive Strength of ASTM C1798 Proportioned Concrete Mixtures for Typical Applications

Added Benefits of Reusing Returned Fresh Concrete

- Improved jobsite productivity: Cycle times are a key measure of productivity in the ready-mixed concrete business. By decreasing or eliminating trips to dispose of concrete, trucks are not sidelined for concrete disposal, thus, enabling greater jobsite productivity.
- Reduces the use of reclaimer/recycling units
- Significantly reduces disposal of returned concrete
- Results in reduced environmental concerns pertaining to the disposal of concrete washwater and plastic concrete

Summary

BASF Corporation's MasterSet DELVO admixture was instrumental in Central Concrete Supply Company and Right Away Redy Mix in meeting their stated goals: to reuse their returned fresh concrete and thereby reduce waste, improve job site productivity and achieve equal or better performance for their customers.

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