

TB-1702 — CONCERA® SA8080 Control Flow Frequently Asked Questions Technical Bulletin

Rheology Modifying High Range Water Reducer

What is CONCERA® SA8080?

CONCERA® SA8080 is a patented rheology modifying polycarboxylate based high range water reducer that enables the production of Control Flow Concrete with minimal or no segregation using unmodified conventional mix designs. When CONCERA® SA8080 is used in these mix designs, minimal or no mechanical consolidation, including vibration, is required. CONCERA® SA8080 is a component of GCP's Control Flow Concrete System which is a new concrete category that GCP is promoting to the industry with slump flows that reside between conventional and self-consolidating concrete. It does not need to be used with other mid or high range water reducers. CONCERA® SA8080 is formulated primarily for use in ready-mix concrete applications where increased flowability, excellent rheology and segregation resistance properties are desired.

What are the advantages and benefits of CONCERA® SA8080?

CONCERA® SA8080 imparts many desirable properties to Control Flow Concrete including segregation resistance, stability, improved passing and filling ability, excellent tolerance to moisture variation and extended slump life. CONCERA® SA8080 also produces concrete with very consistent, predictable slump flow and air control properties. CONCERA® SA8080 has minimal impact on other concrete properties including early and later age compressive strength and drying shrinkage while initial time of set and total bleed may slightly increase depending on specific conditions.

What are the differences between self-consolidating concrete (SCC) and Control Flow Concrete?

Self-consolidating concrete (SCC) is highly flowable non-segregating concrete that can be spread into place, fill formwork and encapsulate formwork without using mechanical consolidation. SCC slump flows are typically in the 18-32" (457 mm to 813 mm) range and are specified by application requirements. Control Flow Concrete is similar to SCC, but with slump flow values in the 16-25" (406 mm to 635 mm) range that will require minimal external energy to properly consolidate. (Note: 9" (229 mm) slump standard concrete typically has a slump flow of approximately 16" (406 mm)). A primary difference between SCC and Control Flow Concrete is SCC typically requires specifically designed high cement factor, high fine to coarse aggregate ratios using smaller nominal size coarse aggregate mix designs, while Control Flow Concrete often uses conventional mix designs.

Can slight mix design adjustments improve the rheology, stability and segregation resistance properties of CONCERA[®] SA8080 concrete?

In most cases, adding CONCERA[®] SA8080 to unmodified conventional mix designs will increase slump flows to 16-25" (406 mm to 635 mm) range while providing excellent rheology, stability and segregation resistant properties. However, specific characteristics of the conventional mix design will affect the overall properties of CONCERA[®] SA8080 Control Flow Concrete. These characteristics include, but are not limited to, total cementitious, water, coarse aggregate, fine aggregate and plastic air contents along with coarse aggregate nominal size, angularity and gradation. If some segregation or instability is observed with CONCERA[®] SA8080 Control Flow Concrete, slight mix design modifications can be made to improve these properties. Potential modifications include slightly increasing the FA/CA ratio, reducing the W/C ratio while increasing CONCERA[®] SA8080 dosage rate and decreasing nominal coarse aggregate size. Technical Bulletin 1701 discusses these modifications in detail.

How does using CONCERA[®] SA8080 compare to using a HRWR and viscosity modifying agent (VMA) combination?

CONCERA[®] SA8080 or a HRWR and VMA (such as V-MAR3) combination can be used to produce Control Flow Concrete, with the primary difference being CONCERA[®] SA8080 is formulated to be a "one admixture does it all." CONCERA[®] SA8080 is formulated as a stand alone admixture with best in class viscosity modifying agents to enable stable, segregation resistant concrete coupled with PC based dispersant technology to produce consistent and superior water reduction and slump flow retention properties. In addition, if a HRWR mix segregates and a VMA is added to provide cohesiveness and reduce segregation, this can potentially cause the mix to have a higher viscosity and sticky feel.

How do I transport and pump CONCERA[®] SA8080 Control Flow Concrete?

CONCERA[®] SA8080 Control Flow Concrete can be transported using conventional methods, but some precautions should be considered due to the high fluidity of the mix. When CONCERA[®] SA8080 Control Flow Concrete is transported to a jobsite in a ready-mix truck, the concrete volume should not exceed 80% of the maximum drum capacity per ASTM C94. This will ensure no spillage on sloped grades during transit. There are no restrictions related to pumping CONCERA[®] SA8080 Control Flow Concrete and pump pressure reductions will typically make it easier to pump CONCERA[®] SA8080 Control Flow Concrete compared to conventional concrete. It is recommended pump pressures be gradually increased since very high initial pump pressures can cause segregation with Control Flow Concretes.

How do I place CONCERA[®] SA8080 Control Flow Concrete in formed concrete applications?

With CONCERA[®] SA8080 Control Flow Concrete formed concrete applications, it is important that formwork be watertight and grout-tight (non leaking) to prevent honeycombing and other surface defects. Form pressures will also be higher, compared to conventional concrete, due to the highly flowable characteristics and often faster than usual casting rates. Maximum lateral pressure and its rate of drop over time is impacted by the mix design consistency, rheology, thixotropy, casting rate and ambient and concrete temperature. Therefore, with current available information, a conservative approach should be to design formwork for full liquid head, in accordance with ACI 347. It is recommended Control Flow Concrete mix designs be field tested prior to job start up (mock-up), preferably through plant production equipment and with actual casting into simulated formwork.

How do I place and finish CONCERA® SA8080 Control Flow Concrete in slab on grade applications?

Placing and finishing CONCERA® SA8080 Control Flow Concrete in slab on grade applications is typically both easier and somewhat different, compared to conventional concrete. In general, ACI 302.1 - Guide to Concrete Floor and Slab Construction guidelines should be followed when placing a slab using CONCERA® SA8080 Control Flow Concrete. ACI 302.1 Section 8.4 Table 8.4.1 recommendations will require modification to allow > 5" (>125 mm) maximum slumps. Control Flow Concrete should be discharged continuously from one location and allowed to fully flow before moving to the next pour location. The intent should be to allow Control Flow Concrete to fill forms and self-level as much as possible on its own, followed by minimal mechanical consolidation such as raking and vibration. Control Flow Concrete can be poured against concrete that has slightly gelled, but should be vibrated to avoid pour lines. If needed, screeds, vibratory screeds and bull floats used on conventional concrete can be used to level Control Flow Concrete. Control Flow Concrete will accept any type of final finish, including magnesium float swirl, steel trowel or broom.

Is CONCERA® SA8080 compatible with all GCP and competitive admixtures?

CONCERA® SA8080 is compatible with all GCP commercially available admixtures except naphthalene based admixtures including DARACEM®19 and DARACEM®100. It is expected CONCERA® SA8080 will be compatible with most standard competitive admixtures. However, it is recommended pre-job testing with specific concrete mix designs is conducted to verify cement, supplemental cementitious materials (SCM's), aggregate and admixture compatibility and performance.

What is the recommended batch sequencing for CONCERA® SA8080?

In most cases, it is recommended that CONCERA® SA8080 be added to the concrete mix near the end of the batch sequence for optimal performance. Different sequencing may be used if testing shows better performance. CONCERA® SA8080 should not come in direct contact with any other admixture during batching.

When and where is CONCERA® SA8080 available?

CONCERA® SA8080 is commercially available in the U.S. and Canada. CONCERA® SA8080 samples are available for testing through GCP NA customer service (phone: 877 423-6491, email: customersolutions.na@gcpat.com).

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What is the pricing of CONCERA® SA8080?

Contact your local Account Mgr. for Concera SA8080 pricing in your territory.

What is CONCERA® SA8080 status with ASTM testing and certification?

Final 1 year *ASTM C494 Type A and F* and *ASTM C1017-Flowing Concrete* CONCERA® SA8080 reports are available.

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