

# DARACEM<sup>®</sup> 50

Mid-range water-reducing admixture ASTM C494 Type A

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## Product Description

DARACEM<sup>®</sup> 50 is a mid-range water reducer specifically formulated to produce concretes with dramatically enhanced finishing characteristics and normal setting times. Effective through a wide addition rate range, DARACEM<sup>®</sup> 50 combines the benefits of normal and high-range water reducers allowing for the ultimate control of the concrete's placing and finishing properties.

DARACEM<sup>®</sup> 50 is formulated with set accelerators (calcium chloride), which promotes more complete hydration of Portland cement to assure superior strength performance. It is manufactured under rigid controls which provide uniform, predictable performance. Supplied as a dark brown, low viscosity liquid, one gallon weighs approximately 10.5 lbs (1.26 kg/L).

## Uses

DARACEM<sup>®</sup> 50 produces a concrete with lower water content, improved placement properties, and enhanced finishability. It yields a less permeable and more durable concrete. DARACEM<sup>®</sup> 50 is used in ready-mix, job site and concrete paving plants for normal and lightweight concrete, in block and precast. It imparts a "slickness" to the surface of the concrete making it most appropriate for concrete flatwork as well as slip form work. DARACEM<sup>®</sup> 50 is also effective in fly ash and slag compensated mixes.

## Advantages

DARACEM<sup>®</sup> 50 offers significant advantages over conventional water reducers. Laboratory and field work has consistently demonstrated:

### Ultimate workability and finishability

The exceptional water-reducing capabilities allow for concrete production at higher slumps with better water retention and internal cohesiveness, providing a less "sticky" concrete with improved placement properties. Formulated with proven finishing enhancing components, DARACEM<sup>®</sup> 50 controls bleeding while bringing the mortar to the surface. Finishers have stated that the concrete has improved trowelability. The influence of DARACEM<sup>®</sup> 50 on the finishability of lean mixes has been particularly noticeable. Floating and troweling, by machine or by hand, easily imparts a smooth, close tolerance surface with less machine time and labor.

### Neutral setting times

Formulated with a set control agent, DARACEM<sup>®</sup> 50 provides normal setting characteristics throughout its addition rate range. This allows for increased water reduction and increased slump without significantly extended setting times. It also allows the flexibility to vary addition based on specific job and weather requirements.

## Superior strength performance

The water reduction properties and dispersion characteristics allow the production of lower water to cement ratio concretes and more complete hydration. The combined effect is increased compressive and flexural strengths at all ages.

## Addition Rates

The addition rate range of DARACEM<sup>®</sup> 50 is 3 to 9 fl oz/100 lbs (190 to 590 mL/100 kg) of cement. Typically excellent results are achieved between 5 to 7 fl oz (325 to 460 mL). Optimum addition depends on the other concrete mixture components, job conditions and desired performance characteristics.

## Compatibility with Other Admixtures and Batch Sequencing

DARACEM<sup>®</sup> 50 is compatible with most GCP admixtures as long as they are added separately to the concrete mix. In general, it is recommended that DARACEM<sup>®</sup> 50 be added to the concrete mix near the beginning of the batch sequence but after the cement and water are combined for optimum performance. Different sequencing may be used if local testing shows better performance. Please see GCP Technical Bulletin TB-0110, *Admixture Dispenser Discharge Line Location and Sequencing for Concrete Batching Operations* for further recommendations.

Pretesting of the concrete mix should be performed before use, as conditions and materials change in order to ensure compatibility, and to optimize dosage rates, addition times in the batch sequencing and concrete performance. For concrete that requires air entrainment, the use of an ASTM C260 air-entraining agent (such as Daravair<sup>®</sup> or Darex<sup>®</sup> product lines) is recommended to provide suitable air void parameters for freeze-thaw resistance.

## Packaging & Handling

DARACEM<sup>®</sup> 50 is available in bulk, delivered in metered tank trucks, totes and drums.

DARACEM<sup>®</sup> 50 will freeze at approximately 15 °F (-9 °C) but will return to full strength after thawing and thorough mechanical agitation.

## Dispensing Equipment

A complete line of accurate, automatic dispensing equipment is available. DARACEM<sup>®</sup> 50 may be added to the concrete mix on the sand or in the batch water.

## Specifications

Concrete shall be designed in accordance with *Standard Recommended Practice for Selecting Proportions for Concrete*, ACI 211.

The water-reducing admixture shall be a mid-range water-reducing admixture such as DARACEM<sup>®</sup> 50 as manufactured by GCP Applied Technologies, or its equivalent. It shall meet the requirements of *Specification for Chemical Admixtures for Concrete* ASTM Designation C494 as a Type A admixture. Certification of compliance shall be made available on request. The admixture shall be considered part of the total mixing water.

The admixture shall be delivered as a ready-to-use liquid product and shall require no mixing at the batching plant or job site.

DARACEM<sup>®</sup> 50 contains 0.007 lbs/fl oz of chloride ion (0.1073 g/mL). At 9 oz/100 lbs (590 mL/100 kg) of cement the chloride ion contribution of this admixture is 0.06% by weight of cement. This is below the recommendations of ACI 202.2 R-77 *Guide to Durable Concrete* and ACI 318-83 *Building Code Requirements for Reinforced Concrete*. DARACEM<sup>®</sup> 50 should not be used in prestressed concrete.

Where specifications further restrict the use of chlorides in concrete, GCP manufactures non-chloride mid-range water reducers; DARACEM<sup>®</sup> 55, DARACEM<sup>®</sup> 65 and MIRA<sup>®</sup>70.

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