

TB-0903 — General Properties and Benefits of DCI® S Corrosion Inhibitor Technical Bulletin

/ concrete / mix design

Introduction

DCI®S Corrosion Inhibitor is formulated for situations where accelerated concrete set times are not required or desired. Such applications may include warm or hot weather cast-in-place construction and prestress concrete. DCI®S is a non-accelerating version of DCI®Corrosion Inhibitor. DCI®S contains a set control component that compensates for the accelerating effect of DCI®. The result is:

- Corrosion protection identical to DCI®
- Set time performance similar to untreated concrete
- DCI® concrete with improved slump life

DCI®S will not be exactly neutral setting for all cements at all weather and project conditions. Preconstruction testing is required.

Corrosion Protection

For corrosion protection, DCI®S is equivalent to DCI®on a unit to unit basis. If a project specification requires 20 L/m³ (4.0 gal/yd³) of DCI Corrosion Inhibitor, 20 L/m³ (4.0 gal/yd³) of DCI®S may be substituted.

Mix designs for DCI®S concrete should be handled as described in the technical bulletin, "Proportioning DCI®(and DCI®S) Concrete Mixes" (TB-0900), with one exception — little correction has to be made for acceleration. Because DCI®S is essentially a neutral set admixture, offsetting acceleration with a retarder may not be necessary. It is important to remember, however, that the set control component of DCI®S only compensates for the accelerating effect of the DCI®. When weather conditions warrant the use of a retarder in normal concrete, it should be included with a DCI®S mix. As with DCI®, trial mixes with the project's concrete materials must be performed with DCI®S several weeks before the project start-up in order to adjust the mix to obtain the desired air content, set time and slump.

Example 1: Concrete Temperature 21 °C (70 °F); Ambient Temperature 21 °C (70 °F)

Materials	DCI® Mix	DCI® S Mix
Cement, kg/m ³ (lbs/yd ³)	390 (658)	390 (658)
Water, kg/m ³ (lbs/yd ³)	156 (263)	156 (263)
DCI® /DCI® S, L/m ³ (gal/yd ³)	19.8 (4.0)	19.8 (4.0)
ADVA®, mL/100 kg (oz/100 lbs)	261 (4.0)	261 (4.0)

DARATARD® 17, mL/100 kg (oz/100 lbs)	261 (4.0)	0 to 130 (0 to 2.0)
DARAVAIR®, mL/100 kg (oz/100 lbs)	as needed	as needed

Comparable Concrete Mix Designs

The following two examples show DCI® mix designs altered for DCI® S. Note that the water content includes the 0.86 kg/L (7.0 lbs/gal) of water contributed by the DCI® or DCI®S.

Example 2: Concrete Temperature 32°C (90°F); Ambient Temperature 32°C (90°F)

Materials	DCI® Mix	DCI® S Mix
Cement, kg/m³ (lbs/yd³)	390 (658)	390 (658)
Water, kg/m³ (lbs/yd³)	156 (263)	156 (263)
DCI® /DCI® S, L/m³ (gals/yd³)	19.8 (4.0)	19.8 (4.0)
ADVA®, mL/100 kg (oz/100 lbs)	261 (4.0)	261 (4.0)
DARATARD® 17, mL/100 kg (oz/100 lbs)	391 to 522 (6.0 to 8.0)	261 to 326 (4.0 to 5.0)
DARAVAIR®, mL/100 kg (oz/100 lbs)	as needed	as needed

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