

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/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 (gals/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)	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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Last Updated: 2020-03-09

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