Effect on Water Reduction, Air Entrainment and Setting Time by Daraccel® Accelerator

Water Reduction

Daraccel® meets the requirements of ASTM C494, Type E, accelerating and water-reducing admixture. Over the range of 750–1100 mL/100 kg (12–16 oz/100 lbs) of cement addition rate, Daraccel will provide 5–10% water reduction, depending on the temperature, cement factor, cement composition, etc. This water reduction, in combination with the chemical control of the cement hydration, produces strength increases in cold-weather concrete as high as 165% in the early life of the concrete and up to 125% at 28 days. While higher dosages such as 1500–2100 mL/100 kg (24–32 oz/100 lbs) of cement do not substantially increase water reduction, some increase may be obtained. Significant increases in high-early strengths are gained at the 1500–2100 mL/100 kg (24–32 oz/100 lbs) dosage rate due to increased rate of cement hydration.

Air Entrainment

Daraccel does entrain some incremental air. On the average, and over the recommended addition rate range, this value will be close to 1.5%. When added in conjunction with an air-entraining admixture, the two appear to act synergistically to produce more than the anticipated amount of air. Therefore, it is recommended that the normally used addition rate of the air-entraining admixture be reduced approximately 25% when used in concrete that is admixed with Daraccel. With increasing addition rates of Daraccel, the amount of air-entraining admixture may need to be proportionally reduced.

Setting Time

Above 10°C (50°F) concrete temperature, Daraccel, used at a dosage rate of 750–1100 mL/100 kg (12–16 oz/100 lbs) of cement will produce approximately 25–40% set acceleration. Addition rates in excess of this range may give some increase in acceleration; however, the degree of set acceleration is not directly proportional to the addition rate.