



Technical Bulletin: Cold Weather Products

With winter arriving soon we should start to consider cold weather concreting practices, many of which also apply to the application of repair & restoration mortars and grouts as well. The American Concrete Institute (ACI) and Portland Cement Association (PCA) have recommendations and guidelines which outline best practices and industry recommendations.

Cold weather conditions are outlined in ACI 306R, Guide for Cold Weather Concreting, as 'cold weather' existing "when air temperatures have fallen below 40°F (4°C) during the protection period", where the 'protection period' is defined as "the time required to prevent concrete from being affected to cold weather". ACI 306R continues to state that "the necessary degree of protection increases as the ambient temperature decreases".

The PCA notes that "significant ultimate strength reduction (up to 50%) can occur if the concrete is exposed to freezing within a few hours after placement" and recommends a compressive strength of at least 500 psi (3.5 MPa) be attained before the concrete is subjected to freezing.

According to ACI 318, at 50° (10°C) most well-proportioned concrete mixtures reach 500 psi (3.5 MPa) within 48 hours.

ACI 308 recommends a compressive strength of 4500 psi (31 MPa) for concrete subjected to deicers and freeze/thaw conditions. It is generally accepted that concrete mixtures should contain a minimum cement content of 564 lb. (255.8 kg) of cement and an air content of 5-7% for good freeze thaw resistance.

Curing methods and procedures during cold weather concreting are variable depending on what type of cold weather protection is used (blankets, heated enclosures, or internal heating).

If insulated blankets are used there is not a concern as there would be if a heated enclosure was used where the temperature was warm, the humidity typically low and the surface prone to rapid drying; therefore in heated enclosures a membrane forming curing compound or a or other curing methods meeting ACI 308 is recommended.

Evaporation Retardants

In the cold weather, where concrete sets much slower and the humidity is typically much lower, more moisture can be lost from the concrete therefore making the use of an evaporation retardant just as beneficial, if not more, as in the hot weather.

AquaFilm J74 & J74RTU

Repair Mortars

These rapid setting, and very rapid setting, repair mortars can be placed at temperatures as low as 40°F (4°C). Rapid setting and very rapid setting mortars require less protection time from colder weather.

HD 50

- ASTM C928, Rapid set repair mortar
- Pourable consistency for horizontal repairs
- Polymer modified; fiber reinforced

HD 25VO

- ASTM C928, Rapid set repair mortar
- Designed for vertical and overhead applications
- Polymer modified; fiber enhanced



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Curing & Sealing:

Cure & Seal LV 25% J20UV

- Solvent-based
- 25% Solids
- Sprayable from 35°F to 90°F (2°C to 32°C).
- Meets ASTM C309, AASHTO M148 Type I, Classes A & B
- Meets ASTM C1315, Type I, Class A

Non-Shrink Grout

Turbo Grout LT-12

- Meets ASTM C1107
- Non-shrink, non-metallic, non-corrosive cementitious grout.
- Designed for wind turbine industry
- Low Temp! Install down to 35°F ((2°C)
- 12,000 psi @ 28-day in 35°-40°F (2°C to 5°C).

Epoxy Repair Mortar Kit

Rapid Resin Repair

- 3-component, 100% solids
- Epoxy/urethane hybrid for concrete repair and patching
- Fast setting, horizontal epoxy repair mortar
- Cures in temps down to -20°F (-29°C)

Chemical Anchoring & Adhesives

Pro-Poxy™ 400

- Non-sag gel for epoxy
- Down to temperatures of 5°F (-15°C).