



TECHNICAL BULLETIN 101

Cementitious Grouting in Cold Weather

Cold temperatures delay set time and strength development of cementitious grout. Cementitious grout, like concrete, must be allowed to attain a “green strength” before being subjected to freezing temperatures. The following guidelines may help compensate for cold temperature placement.

- A. Materials should be preconditioned/stored as necessary so the mixed grout is between 40°F and 80°F (4°C and 27°C). Due to the mass of palletized (bagged) material, up to 72 hours of preconditioning may be required. Store grout in an indoor or a tarped and heated area when required.
- B. All surfaces in contact with grout should be preconditioned and maintained at a temperature between 35°F and 90°F (2°C and 32°C) for 8 - 24 hours. Presoaking concrete with hot water (90°F/32°C) may aid in raising concrete surface temperatures. Mixing grout with warm or hot water should also be considered. Ensure water used for presoaking does not freeze on concrete surfaces.
- C. Heating shall be accomplished by indirect exposure - do not blow heat directly onto newly placed grout surfaces. Heated enclosures should be windproof and weatherproof as much as possible. Combustion heaters must be vented and shall not be permitted to heat and dry the concrete locally. Caution: Exhaust gases may contaminate or cause carbonation within the enclosed environment.
- D. Grout temperature shall be maintained above 35°F (2°C) until the grout reaches a minimum compressive strength of 1000 psi (6.9 MPa). Depending upon grout mix temperature and grout thickness, this may take upwards of 48 hours. For Five Star® Instant Grout, this time period is usually only 4 hours when air temperatures are at 35°F (2°).
- E. Gradually reduce temperature of grout to ambient temperature to avoid thermal shock.

REFERENCE:

ACI 306R-88: “Cold Weather Concreting”

ACI 351.1R-99: “Grouting Between Foundations and Bases for Support of Equipment and Machinery”

PIP/API RP 686: “Process Industry Practices”



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