



Concrete Repair & Foundation Installations Cold Weather

Cold temperatures delay set time and strength development of concrete materials. Concrete materials must be allowed to attain a minimum compressive strength before being subjected to freezing temperatures. The following guidelines should be used for cold temperature placement. Contact Five Star Products for Five Star® Structural Concrete ES-60 cold weather usage.

A. Environmental Conditioning

Temperature is a critical factor in the installation of concrete materials. The temperature of the environment and the materials being used must be controlled throughout the installation and curing process using heaters, tenting, insulating materials, etc. as required.

B. Product/Placement Pre-Conditioning

1. Materials shall be preconditioned/stored as necessary, so the mixed product 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 product in an indoor or a tarped and heated area when required.
2. Consult Five Star® Technical Data Sheet for product specific surface preconditioning temperatures. For applications on a concrete substrate, presoaking substrate with hot water may aid in raising substrate surface temperatures. Mixing product with warm or hot water should also be considered. Ensure water used for presoaking does not freeze on substrate surfaces.

C. Post-Placement

1. Consult Five Star® Technical Data Sheet for product specific curing time and/or temperature requirements. After initial wet cure, material shall be coated with an approved curing compound or refer to Five Star® Technical Data Sheet for product specific requirements.
2. Protect installed product from wind, rain, freezing, and vibration until the material reaches a minimum compressive strength of 1,000 psi (7 MPa) and the product has cured. Curing concrete materials at cold temperatures will delay strength development.
3. Field test samples, as needed, shall be maintained at the same installation temperature conditions to monitor strength development.
4. Begin wet cure immediately after product takes final set (color change) and continuously wet cure all exposed material surfaces using wet rags, burlap, wet hessian, or burlene saturated with potable water. Place plastic sheeting over material used for wet cure to protect against evaporation. Monitor condition of material used for wet cure (i.e. rags) to ensure drying does not occur.
5. During the curing process, protect the material from direct sun and wind exposure. Do not allow product or curing materials to freeze.
6. Heating shall be accomplished by indirect exposure (radiant heat recommended). Do **NOT** blow heat directly onto newly placed product surfaces. Heated enclosures must be windproof and weatherproof. **Caution: Combustion heaters must be vented. Exhaust gases may contaminate or cause carbonation in the material within the enclosed environment and create a health and safety hazard.**
7. Gradually reduce the temperature of the material to ambient temperature to avoid thermal shock.
8. In-service operation may begin immediately after the required product compressive strength has been reached.

For additional information, contact your Five Star® Technical Sales Representative.

Five Star Products follows standard industry practices. For more information, refer to ACI 306R-16: *Cold Weather Concreting*; ASTM C109/C109M-20b *Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-In. or [50 Mm] Cube Specimens)*; ASTM C309-19 *Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete*.

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FIVE STAR PRODUCTS, INC.
2 Enterprise Drive • Suite 303
Shelton, CT 06484 USA
Phone: +1 203-336-7900

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