



# Cold Environment Application Techniques

## 10 Minute Concrete Mender™ & Flexible Cement II™



Cold environments such as walk-in freezers and extreme northern climates pose difficult challenges for repairing concrete. In temperatures less than 0° F, most repair materials become unworkable and may take many hours to set and cure. Roadware Polyurethanes have been used in temperatures as low as -20°F below freezing. Listed below are some problems and solutions for working in cold environments.

### Cold Environment Challenges

**Frost:** Frozen moisture in the concrete will act as a barrier between the repair material and the pours of the concrete. Most repair materials will try to bond to the frost coated concrete. When the temperature increases, the frost melts and so does the bond.

**Working Conditions:** Working with materials in the cold is challenging to both man and materials. Mixing epoxies or mortars in the cold is especially challenging. As the temperature decreases, the viscosity and flow rate of these materials increase making them harder to mix and much more difficult to work with.

**Curing:** With most materials, cure times in cold environments are extended significantly. A product that normally cures in an hour at room temperature may take as much as 12 hours in a cold environment. Some materials may not cure at all before actually freezing solid.

### ROADWARE Solutions

The extremely low viscosity and rapid cure times of Roadware 10 Minute Concrete Repair products make them excellent for cold environment application. Successful repairs are routinely made at temperatures below -20°F in freezer floors.

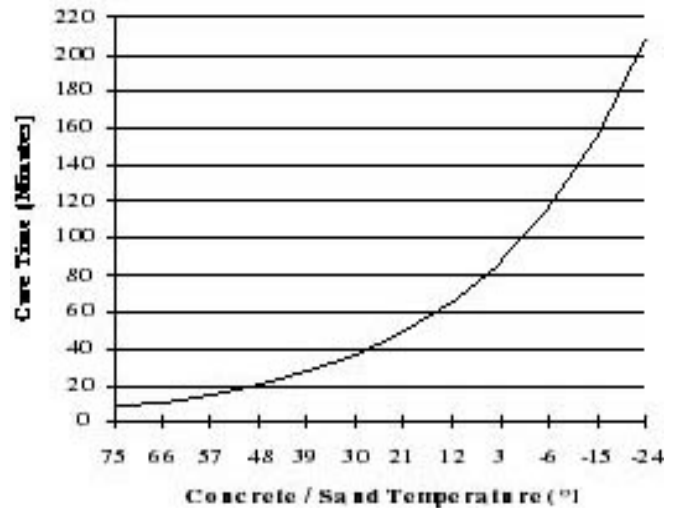
**Preparation:** Prepare cracks, joints, and spalls according to standard recommended methods. Make every effort to remove any moisture from the repair area. A propane torch or heat gun is very helpful in removing frost and moisture. In extreme cold, it is necessary to heat up the concrete prior to application.

**Application:** Keep material and sand or aggregate warm. Place materials in a warm area (between 70°F and 90°F) prior to application. Warm cartridges mix better, flow easier, and cure faster. Apply material as directed. It is a good practice to pre-wet all concrete surfaces with material before the introduction of sand. This insures full penetration and a strong bond.

**Curing:** Roadware materials are designed to cure in approximately 10 minutes when all components involved are at 70° F. In cold environment, the cure time depends on the temperature of the material, the temperature of the sand or aggregate if used, the volume of the repair, and the temperature of the concrete. Below is a chart of approximate cure times at various temperatures and conditions.

**Storage:** Roadware material should be stored between 60°F and 80°F. Material stored in extremely cold environments should be slowly brought up to room temperature before use. It may be necessary to agitate material subject to extreme cold prior to mixing. Call Roadware Technical Services for further instructions (800-522-7623).

Cure time at various temperatures / Roadware material at 75°F



*Note: Actual cure times will vary according to repair volume and material, aggregate, and work site temperatures. Cure time may be accelerated by heating the concrete and the sand or aggregate. This chart will serve as a guide to cure times.*

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