

**TECH
TIPS**

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Cold-Weather Injection Grouting: Key Considerations for Below-Grade Structures

By NASSCO ICGC Chair Jessica Williams, Avanti

Cold weather doesn't stop grouting—but it does change how the work should be completed. In regions that experience prolonged periods of below-freezing temperatures, cold weather and frozen ground can complicate injection grouting operations for below-grade wastewater structures. Lower temperatures affect material behavior, reaction times, and installation performance, making proper planning, grout selection, and implementation critical. This NASSCO Tech Tip explores considerations and solutions for successful, long-lasting grout installations in winter conditions.

Temperature Effects on Cure Time

Temperature plays a critical role in injection grout curing and reaction times. For acrylic grouts, a common rule of thumb is for every 10°F decrease in temperature (ex. 75°F to 65°F), cure time doubles. Conversely, for every 10°F increase (ex. 75°F to 85°F), cure time is reduced by half. While these values are approximate, it emphasizes how significantly cold temperatures can impact grouting performance.

To help offset cold conditions, grouters can increase material or batch mix temperatures using methods like heat banding, heated storage, or using warm water during mixing. As temperatures drop, grout materials tend to thicken, increasing viscosity and extending cure times which can impact permeation and overall effectiveness.

For polyurethane grouts, the same rule of thumb does not apply. Temperature impacts hydrophilic and hydrophobic polyurethane differently than acrylics. Hydrophobic polyurethanes offer greater flexibility in cold weather because the required catalyst amounts can be adjusted to either accelerate or slow the reaction. Hydrophilic grouts are usually not ideal for areas that have constant freeze/thaw cycles as they are moisture dependent. Always consult the product's Technical Data Sheet (TDS) for guidance regarding temperature sensitivity and acceptable catalyst adjustments.

Increasing Catalyst Amounts

Catalysts initiate the chemical reaction that allows the injection grout to cure. Not all grout systems utilize catalysts; some are water- or chemical-activated, while others require dedicated additives. Depending on site conditions and the desired reaction time, catalyst amounts may be adjusted within manufacturer-recommended limits.

Generally, reducing the amount of catalyst will increase cure time, while increasing the catalyst will shorten reaction time. A standard cup test using site water should always be performed to verify the targeted gel and reaction times are achieved prior to injection. Catalyst adjustments should only be made in accordance with the manufacturer's TDS to ensure predictable performance and long-term durability.

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Optional Additives

Optional additives can enhance grout performance during cold-weather installations. Certain additives are designed to lower freezing points, strengthen gels, and improve adhesion and flexibility at reduced temperatures. These products can help maintain effective permeation and performance when working in cold conditions. Compatibility and dosage recommendations should always be reviewed before use.

Material Storage

Proper material storage is essential during cold-weather grouting operations and storage. Grout materials, catalysts, and additives should be stored in heated or insulated environments to prevent freezing and maintain consistent properties (ex. keep products within or near 45°F-95°F). Frozen or partially frozen materials may experience irreversible changes in viscosity, reaction time, and performance. Staging materials in temperature-controlled areas prior to mixing and injection helps ensure consistent results. Keep out of direct sunlight.



Equipment Maintenance

Cold temperatures can affect pumps, hoses, seals, and fittings. Equipment should be inspected regularly for stiffness, cracking, or reduced performance caused by cold exposure. In very cold conditions, moisture in compressed air systems can freeze, blocking airflow. To prevent this, ensure the air dryer is functioning effectively to remove humidity, and drain the air system. Lines and pumps should be flushed and drained at the end of each shift to prevent freezing, and insulated or heated enclosures should be used for extended cold-weather operations. If grout remains in the tanks, pumps, or hoses overnight and the vehicle cannot be parked in a heated garage, use space heaters inside the truck to maintain temperatures above freezing to protect the material and equipment. Proper equipment helps maintain accurate mixing, reliable grout delivery, and uninterrupted production.

Key Takeaway

Cold weather injection grouting presents unique challenges but is entirely achievable with the right approach. Understanding temperature impacts, selecting appropriate materials, adjusting application techniques, and maintaining proper material storage and equipment care are all essential components of cold weather grouting success. By following manufacturer guidelines and best practices, contractors can minimize risks, maintain performance standards, and deliver durable, long-lasting rehabilitation solutions—even in harsh winter conditions.

Learn more about injection grouting and the Infiltration Control Grouting Committee (ICGC) at NASSCO.org/grouting.

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