



Liquid Roadway Treatments Start-Up Reference Guide

For Clear Roads by Stonebrooke Engineering
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Benefits of Liquid Roadway Treatments

Liquid roadway treatments are:

- **Responsive:** Liquid treatments begin working immediately
- **Reliable:** Liquids work predictably and accurately
- **Straightforward:** Liquids are easy to control and apply
- **Effective:** Liquid treatments stick to the road better than solids
- **Efficient:** Reload times can be shorter for liquids than solids, depending on pump capacity
- **Controlled:** There is less waste with liquids due to the bounce rate of solids
- **Economical:** Most agencies decrease their salt usage by 25-50%



Definitions

- **Anti-icing:** A proactive treatment (sometimes called pretreatment) that involves the application of a liquid treatment prior to the onset of a snow event that prevents snow and ice from bonding to the road surface.
- **De-icing:** A reactive treatment for melting existing snow and ice from a surface, either as a treatment by itself, or to aid in mechanical removal.
- **Direct Liquid Application (DLA):** The use of liquid-only treatments before, during, and after a storm event for anti-icing and de-icing.
- **Liquid-Only Plow Route:** A plow route on which only liquid treatments are used for anti-icing and de-icing when weather conditions fall within appropriate usage parameters.
- **Salt Brine:** A solution comprised of 23.3% sodium chloride (NaCl) and 76.7% water by weight.
- **Magnesium Chloride:** A solution comprised of magnesium chloride (MgCl) and water (ratio varies).
- **Calcium Chloride:** A solution comprised of calcium chloride (CaCl₂) and water (ratio varies).
- **Granular:** Rock salt in solid form.



Tips for Gaining Buy-In

- **Start Slowly:** Consider supplementing existing granular applications with liquids. As success is observed and confidence increases, expand the liquid program and reduce granular rates.
- **Visit Other Shops:** Visiting facilities that already have a successful liquid program can accelerate team buy-in.
- **Partner:** If you do not have a brine maker, consider purchasing brine from a nearby agency while you start your program.
- **Contact Experts:** Utilize online resources to get contact information for liquid treatment experts, including the Clear Roads website at www.clearroads.org
- **Utilize Existing Equipment:** Consider converting or upgrading existing equipment to save on up-front costs.
- **Communicate Effectively:** Keep your team informed of all lessons learned, challenges, and success stories as you test the products. Keeping your team involved in the program can help turn critics into advocates
- **Know the Limitations:** Remember that liquid roadway treatments are just one tool in the toolbox, and they are only effective during certain weather conditions.



Equipment Recommendations

- **Applicator Loading Pump:** This pump will be pumping chemicals, so make sure it is designed for a specific gravity of approximately 1.5 (not a water pump). The minimum port size is 2", but many agencies prefer a 3" size for faster flow rates. The minimum flow rate should be 110 gallons per minute (gpm) at 20 psi. A preferred flow rate is 275 gpm at 20 psi. The discharge hose length should be as short as possible. When choosing the port size, consider the applicator tank inflow line size, outflow line size, and valve sizes. These should match the pump capacity. Most liquid deicers are corrosive, so you will need to select a pump that can resist corrosion. Rock salt also contains stone partials that can cause excessive wear on pump parts, which should be considered when selecting your equipment.
- **Applicator Discharge Pump and Plumbing:** Heavier snowfall with lower temperatures typically requires high application rates. Larger pumps will increase your speed and efficiency. The actual size will depend on your applicator spread width. In one case, an agency suggested 370 gpm pumps for agencies with heavy usage.
- **Applicator Spray Bars:** Spray bars either mount to the tank, the pump, a slide-in bar, or are attached to the truck like a hitch receiver. Many varieties are available, including single, two-lane, and three-lane assemblies.
- **Storage Tanks:** Storage tank size and material will vary, but most agencies have a minimum tank size of 5,000 gallons. The most common types are polyethylene or fiberglass vertical storage tanks. Before choosing a tank, check with your local environmental control agency to determine what your state requires for containment.
- **Loading Area:** Design your loading set-up to be as user-friendly as possible. This will help gain buy-in among the entire team, and will result in a more efficient operation. The number of pumps required for loading will vary depending on your number of trucks using liquids.

