

Prewetting

Prewetting is the practice of adding liquid to the road salt as it leaves the truck/equipment.

The most common combination is rock salt and salt brine.

What liquids to use:

- Most common is salt brine (NaCl)
- Next most common is a brine blend
 - Many options for brine additives
 - Research options before blending.
- Other options exist for extreme cold or for situations where chlorides should be avoided.

Pros of prewetting:

- Easily change the liquid/granular ratio
- Easily change type of liquid
- NaCl brine can be used, which is easy and inexpensive to make
- Easily lower application rate

Cons of prewetting:

- Requires additional equipment (e.g. tanks, hoses, pumps)
- Requires additional training for crew
- Requires accessible liquid storage to refill tanks

Guidelines for prewetting on board

- Average application of prewet is at a ratio between 8-12 gal/ton.
 - See Figure 14 in the Resources Chapter for ounces/pound
- The higher the ratio of liquid to granular, the faster it works.

Brine Specifics

Brine is the mixture of rock salt (NaCl) and water. It works at the same temperature range as dry salt.

If you are new to liquids, start by using brine on pavement temps above 15° F.



An example of a prewetting tank is shown above. This tank holds liquid deicer which is added to the granular deicer as it leaves the truck.

Purchasing brine

Many companies sell liquid deicers. The City of Madison and Dane County both make brine locally and have it available for sale. See Chapter 15 for more information on purchasing brine from the City of Madison or Dane County.

Making and testing brine

You can easily make your own brine with rock salt and water. Combine to a 23.3 percent concentration. This will ensure effectiveness at the coldest possible temperature. It is important to use a salt brine hydrometer to test brine concentration. To read the hydrometer and determine the salt concentration, look for the number at the surface of the brine. Mixing brine to other concentrations could create problems as it will freeze at warmer temperatures.

To make brine you will need:

- Water
- Rock salt
- Salt brine hydrometer

How to make brine:

1. Combine rock salt and water at approximately 2.3 lbs. of salt to 1 gallon of water ratio
2. Brine can stratify in the tank. Stir before testing concentration.
3. Use hydrometer to check concentration of brine solution
4. Adjust as needed
 - a. If concentration is below 23.3 percent, add more salt.
 - b. If concentration is above 23.3 percent, add more water.

Brine additives

It is becoming more popular to add other products to brine to enhance performance in cold conditions by lowering the freezing point. This practice is sometimes called a “hot mix”.

There is a large selection of different brine additives. Talk to your vendor about how much product to use, how to test that it is properly mixed and what the practical melting range for the blend is. There should be a protocol in place for measuring and mixing the additive with the brine to ensure accuracy. Ignoring or not implementing a proper protocol can result in damage to equipment, dangerous conditions or other unwanted results.

Refer to Chapter 4 for best practices when storing brine and other liquids.



The photo above shows where to read a hydrometer to determine concentration. (marked by the arrow and dotted line)

Optimal Concentration of Deicers Chart

Deicer	Optimal Concentration
Sodium Chloride (NaCl)	23.3%
Magnesium Chloride (MgCl ₂)	27-30%
Calcium Chloride (CaCl ₂)	30%
Calcium Magnesium Acetate (CMA)	32%
Potassium Acetate (KAc)	50%
Blends	Talk to supplier

Figure 6: Optimal concentration of deicers²⁰

Waste stream products

The repurposing of other waste stream products such as water softener discharge, pickle juice, cheese brine, soy sauce, or perfume factory alcohols is a tempting idea. However, research is required. You may be creating more of a problem than you are solving. Here are two case studies about waste stream products. One from the [Minnesota Local Road Research Board](#), where Carver County, Minnesota evaluated pickle brine as a potential deicer. Another is a [water softener reclamation operation](#), at Steve Brown Apartments in Madison, Wisconsin.

Routine maintenance required

Routine maintenance of equipment is required when working with liquids. Liquids should be flushed out of lines, hoses, pumps and nozzles after every storm or before switching chemicals to reduce clogging of nozzles and corrosion.