

# Liquids

## Overview

Liquid deicers work faster than granular deicers. Adding liquids to dry products will jump-start the dry product, giving faster results. The wet material will stick to surfaces better than a dry product. There are several ways liquids can be incorporated into operations:

- *Pretreated stockpiles* –a liquid added into the salt stockpile.
- *Prewetting* – liquid and granular products stored separately in a truck/equipment. As the materials are discharged, they are mixed, often this mixing occurs at the spinner or in the auger.
- *Anti-icing* – a liquid-only application before the storm to reduce the bonding between the snow and pavement. For more information see Chapter 9.
- *Direct Liquid Application (DLA)* – a liquid-only application during or after the storm. For more information see Chapter 10.

## Adding in liquids

The most common combination rock salt (NaCl) with salt brine (NaCl and water). When combining liquid and granular products that are not NaCl, it's always a good idea to talk to the vendor and discuss how to combine liquid and granular products. It is possible to pick two products that would create a negative reaction.

Liquids offer many benefits:

- Liquids can melt snow faster than granular salt.
- Liquids stay in place and reduce the possibility of the salt being kicked or moved off target.
- Less granular products are needed when adding in liquids, which could reduce costs
- Could be less harmful for the environment (if application rates are controlled). Brine is 77 percent water.



*A cup of brine causes less damage than a cup of granular salt.*

## Pretreated salt stockpile

Pretreated stockpiles are a mix of mostly road salt with a small amount of liquid. It works faster and at a colder temperature range. It can be purchased or made on site. Leaching, or runoff of a deicer out of the stockpile, is a risk with pretreated stock piles.



*Example of a pretreated stock pile*

Purchased pretreated products are less likely to leach than homemade pretreated stockpiles because they have been blended at the proper ratio with ingredients proven to stay in the stockpile.

Proper storage keeps the moisture away from stockpiles and reduces the chance of leaching.

Homemade pretreated stockpiles are often mixed in smaller quantities (enough for one event). This avoids difficulty storing the stockpile and leaching from becoming issues.

These are the most common ingredients in stockpile additives:

- Deicing liquid – Magnesium chloride ( $MgCl_2$ ), Calcium chloride ( $CaCl_2$ )
- Organic additives (i.e. beet juice or corn syrup)
- Dye

These ingredients should **not** be added to stockpiles:

- Salt brine – Sodium chloride brine ( $NaCl$ ) will evaporate out of piles and form a crust.
- Water – It will evaporate out of piles and form a crust.

### Pros of pretreated stock piles:

- Can be purchased ready to go
- No new equipment is needed.
- Less salt is needed to get the same results as dry salt.
- Works faster and at colder temperatures (if  $MgCl_2$  or  $CaCl_2$  are added)
- Can lower application rates

### Cons of pretreated stock piles:

- Extra time to mix piles or extra cost to purchase premium product
- It is better than dry salt, but only a small amount of liquid is used. It is slower acting than strategies using a higher percentage of liquids (i.e. prewetting).
- Difficult to store

### Guidelines for making pretreated salt:

- Start with dry salt.
- The mixing area should be in a storage shed with a waterproof floor.
- Mix rock salt with liquid deicer (not brine) or stockpile additive.
- Use 4-6 gallons/ton. Higher amounts of liquid increase the risk of leaching.
  - See Figure 14 in the Resources Chapter for ounces/pound conversion.
- Best practice is to mix stockpiles before each storm because these stockpiles are difficult to store properly.