



Kansas LTAP Fact Sheet

A Service of The University of Kansas Transportation Center for Road & Bridge Agencies

Just Add Water

By Brandon Garrett

Pre-wetting your salt can save money by making the salt go farther.

When winter weather strikes, a powerful weapon in a road crew's arsenal is salt—or rather, salt brine. Salt by itself does not melt ice. Salt needs moisture so that it can form salt brine, which then begins the chemical reaction that melts ice.

Chemicals like calcium chloride can be used to pre-wet salt, but just plain water works well, too. You can mix salt brine at your shop and use it to pre-wet road salt before it hits the roads.

As a pre-wetting agent, salt brine costs almost one-tenth the price of the popular calcium chloride, and because you can make it at the shop, there are no delivery charges.

Not too much salt, not too little

Although salt brine is simply salt and water, you must be precise in your measurements because salt's ability to melt ice relies on moisture content. To melt ice properly, salt brine should be 23.3 percent salt. If there is too much water, the salt will be diluted too much, and the water in the brine, not to mention the falling precipitation, will freeze on the road. If there is too much salt in the brine mixture, the road salt will lack the moisture needed to melt ice.

Pre-wetting your road salt

After you have finished making the salt brine, it can be added to your road salt using three basic methods. Some of these methods are better than others.

1) Soak the stockpile. At the first onset of winter, stockpiles of road salt can be pre-treated with salt brine. The



Salt does not melt ice by itself. It needs water. Pre-wetting your salt with brine is an effective way to jump-start the melting process and make roads safer, faster.

method is not very effective because it is difficult to make sure that all of the salt in the stockpile is uniformly wet. It is also a challenge to keep the brine from leaching into the ground. Not recommended.

2) Prewet the salt one truckload at a time, using a sprayer at the shop. This method is more effective, because prewetting small amounts of salt increases the likelihood that all of the salt is uniformly prewitted.

3) Pre-wet before the salt hits the ground. This is the best method. It requires a conveyor belt and a flat brine sprayer mounted directly on the back of a truck that pre-wets salt as it enters the spreader.

Special equipment is needed

Salt brine pre-wetting reduces the amount of road salt (and its associated costs) needed to de-ice roads. However, special equipment is required to mix the brine and treat the salt. You need storage tanks, a brine-maker, and salt-brine sprayers. If you plan to use on-board sprayers to pre-wet salt, non-contact pumps that are resistant to corrosion are needed to move the brine to the truck sprayer tanks.

Cost

Brine mixing tanks cost about \$5,000. On-board salt sprayers cost about \$1,000. To avoid large initial investments, many road and bridge agencies have created their own systems for far less money. If you are building your own system, or just want to make sure the equipment you are about to buy is of good quality, it is important that all of the materials be non-corrosive.



Do's and don'ts

You don't need to pre-wet roads that are already wet. You can probably use dry salt alone for wet snow or freezing rain, while low temperatures with ice and powdery snow will require pre-wetted salt. The Federal Highway Administration considers salt brine to be effective in pre-wetting down to 15 degrees Fahrenheit. Below this temperature, they recommend mixing it with other pre-wetting chemicals that have lower freezing points, like calcium chloride.

Conclusion

Pre-wetting road salt with salt brine is an effective method to jump-start the melting process and make roads safer, faster. With the correct equipment and application procedures, pre-wetting can be a time-saving and cost-effective practice.

Sources

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Reprinted from the Spring 2009 issue of the *Kansas LTAP Newsletter*, a publication of the Kansas Local Technical Assistance Program (LTAP) at the Kansas University Transportation Center.