Why Salt Brine?

Since the weather is beginning to turn colder and we get a number of questions on salt brine, we thought it would be a good time to talk about its use and application. The first thing to discuss is what salt brine is. It contains two ingredients: rock salt and water. The rock salt is dissolved in the water to create a solution. This solution, when applied to surfaces, lowers the freezing point of water to around 15 degrees Fahrenheit. It can be applied to the roadways as a pretreatment to prevent ice formation or during a storm to assist with removal.

Why pretreat a roadway before a storm or freezing conditions? It is a proactive approach. Applying brine before a storm is a preventative measure that stops ice formation before it starts. Brine prevents snow and ice from bonding with the pavement, making it easier to remove and keeping roads from forming ice in the first place. Studies have shown that pretreating requires four times less salt than using straight rock salt to turn a road back to clean pavement. Additionally, it makes the salt reaction last longer by getting the salt down on the pavement's base verses on top of the snow. This allows the salt to keep working while mechanical means like plows can scrape away the top layers, rather than a reactive approach that puts more wear and tear on both the plows and the roads, with lower quality results.

What about during the storm? Brine is typically used as an additive to salt or a salt sand mix to help it cut into packed snow and ice. Brine is often more effective than dry salt alone, especially in cold temperatures, because dry salt can just lie on the road or be blown away before it has a chance to work. By holding it in place and activating it, the rock salt starts to melt faster.

How is brine beneficial? It is cost-effective. Less material is needed, which can lead to cost savings and environmental benefits. Do not just take our word for it – we pulled the following information from the Wisconsin DOT report, "Winter Maintenance at a Glance 2024-2025." Despite being in the second highest category for snowfall, Kewaunee County has been able to see a 17% reduction in salt use per lane mile based on a five-year average. This is compared to surrounding counties who have seen a more than 10% increase in salt usage. This proactive approach has saved the county almost $50,000 per year in salt purchases. Coupled with effectiveness, this makes brine the most cost-effective approach for treating our roadways.

We hope this helps explain how and why brine works, and it helps in your understanding to the "why" of salt brine.

Kewaunee County Highway Department