

# NINJA DE-ICER



**2023 WINTER RESOURCE GUIDE**  
Product & Educational Information

**BULK SALT  
BAGGED SALT  
TREATED SALT  
LIQUID DE-ICERS**



# MEET JUSTIN



## MISSION & VISION

Our vision is simple, to be the snow professionals' choice for de-icers. We see our clients as partners. Our mission is to take the stress out of the "salt game", so you can focus on your business. We provide our partners with reliable and reasonably priced de-icing products, so our Snow Ninjas can tackle any storm.

**M**y name is Justin Rollin, founder of Ninja De-Icer, a company that supplies quality de-icing products to businesses across the country. I have 25 years of industry experience as an owner and operator of my own successful snow removal company. I started my snow removal company with one truck and trailer and grew the company to servicing upwards of 400 accounts in over 10 states. I started selling de-icing products through my snow removal company 15 years ago, as I watched and experienced the little guy getting taken advantage of by the de-icing companies out there at the time. My business model has always been to take a "big brother" approach in business, as I enjoy helping smaller companies grow.

In 2018, I carved out my de-icing business from my snow removal company and started Ninja De-Icer. My goal is to provide the best de-icing products to my customers. Early in 2021, I sold my snow removal company to give my sole focus to Ninja De-Icer. I want to take a hands-on approach and guide newcomers and veterans alike to navigate the dos and don'ts of this highly competitive industry. I understand the needs of customers and want to share my knowledge.



# THE U.S.' ADDICTION TO ROAD SALT IS OUT OF CONTROL

By Ciara Nugent, TIME Magazine, December 2022

This winter's first snowstorm will be an adjustment for some residents in Davenport, a city of 100,000 on Iowa's side of the Mississippi river, which averages nearly 30 inches of snow over the season. Like many towns across the U.S. and Canada, Davenport dumps a hefty amount of rock salt across its roadways each year, melting ice and keeping conditions easy for drivers. But this year, residential streets on the northwestern side of town will be left salt-free.

The trial, which may see residents have to drive a few blocks over snowy roads to reach major arteries, is Davenport's attempt to "find a balance" between road safety and a growing list of problems associated with road salt, says public works director Nicole Gleason.

Ice-free roads may be good for drivers, but scientists warn that salt is seeping into lakes and rivers, including the Mississippi, killing wildlife and posing health risks to humans. Salt also corrodes asphalt and metal, causing some **\$5 BILLION IN DAMAGE EACH YEAR** to roads and cars. And it lures deer and moose onto highways to lick it up, triggering accidents.

And yet, North Americans are addicted to road salt. Road crews have been pouring the stuff in ever greater quantities since the 1950's, when cars and highways began to proliferate across the region. According to the U.S. Geological Survey, the amount of salt used on U.S. roads ballooned from 1 million tons in 1954, to 10 million tons in 1985, to around 24 million tons a year by 2019, as drivers demanded increasing levels of safety and convenience. "Fifteen years ago, it wasn't common practice to expect dry pavement after snow," Gleason says. "But somehow this idea has taken over that everyone should be driving like it's summer in the winter."

## THE QUEST FOR AN ALTERNATIVE TO SALT

As the case against road salt has become firmer over the last decade, scientists and local governments have led a quest to find a less harmful alternative. But success has been limited. Chemical solutions have proven expensive and carry their own environmental risks, like decreasing oxygen levels in water or damaging foliage. Sand works for driveways or small areas where it can be easily swept up, but if used on a larger scale, it can clog drains, contribute to fine particle air pollution, or damage vehicles. Cheese brine has been used to melt snow in Milwaukee, Wis., since 2013—handily using up waste from the local dairy industry. But the available quantities only make a small dent in salt needs. Beet juice has proved effective in many places, but it releases sugar into waterways, fuelling harmful algae blooms which are just as dangerous for wildlife as salt is. As a result, it can only really be used as an additive to salt.

"People always want a silver bullet, but this is a multi-dimensional problem with a lot of pieces," says Xianming Shi, a leading researcher on alternative deicing methods and professor at Washington State University. "I don't think we will find a magic solution."

With dreams of fully replacing salt on hold, many states and cities are focusing on reduction. Public information appeals can help. For example, this winter Sudbury, a city of almost 170,000 in Ontario, is giving out plastic cups in a bid to change residents' salting habits on driveways. The 12 oz cups, the label notes, hold enough salt to safely de-ice 10 sidewalk squares, or 500 square feet—that's far less than many people think they need. The cups also remind people not to bother salting when it's colder than  $-12^{\circ}\text{C}$  ( $10.4^{\circ}\text{F}$ ), because it simply won't work.

## ROAD CREWS CUT BACK

Officials are also trying to make it easier for road crews to cut back on salt. Minnesota is a leader here. Since 2016, the state has run a "smart salting" program to train public road crews and private maintenance workers to apply salt without wasting any, helping organizations cut their usage by between 30% and 70% per the state pollution control agency. Minnesota also has policies limiting the deployment of salt on residential streets, like Davenport is trialing. The state's legislature is now considering a bill that would protect professional salt-appliers and homeowners from legal liability for accidents if they use too little—a factor advocates say has prevented people from using salt sparingly in the past.

The most effective way to cut back on salt may be a more fundamental change in how it's applied. Spraying brines—roughly one part salt to three parts water—on roads in the hours before snow starts to fall prevents ice from forming in the first place. That proactive approach reduces salt needs by anywhere between 23% and 70%. There are challenges: you need very accurate weather forecasts, and the equipment for mixing and transporting brines is more expensive than for conventional salting. But over the last five years the rising cost of salt and growing awareness of environmental threats has convinced many cities to use brine over salt where possible, including New York, Des Moines and Philadelphia.

For Davenport, which already tries to brine where possible and incorporates 5% beet juice to its deicing solutions to replace some of its salt needs, the next frontier is trying to change public expectations around how clear roads need to be. Judith Lee, the city council member who proposed the trial, says some constituents have expressed anger about the idea of not salting. "They thought we were going to let them slide around on ice, and of course that's not the case," she says, noting that road crews will still attend to the trial area if dangerous conditions develop. "But when we talk through all the reasons we want to cut back, people start to understand."

Shi, the researcher, hopes more local and state governments will find ways to curb their salt addiction. If they can't, 50 years from now the sodium content of many water sources could reach levels unsafe for human consumption, he warns. "Convenience for this generation—driving from point A to point B fast—could mean our grandkids are drinking salty water."

**12 oz. cups hold enough salt to safely de-ice 10 sidewalk squares, or 500 square feet — that's far less than many people think they need.**



# TRUE COST

OF OVER SALTING

## WHY IS SALT REDUCTION IMPORTANT?

- ✓ COST OF **DE-ICING PRODUCTS**  
Increase of **173%** over last 21 years
- ✓ COST OF **REPAIRS TO INFRASTRUCTURE, VEGETATION & EQUIPMENT**  
**\$1 Salt = \$10 Damage**  
(1 ton of salt = \$700 damage)
- ✓ COST TO **ENVIRONMENT**

## ENVIRONMENTAL IMPACT

**WATER WAYS** (*Lakes, Rivers, Streams*)  
Chloride levels are consistently high year round in many waterways (*at or above the toxic level set by EPA*)

**AQUATIC LIFE** (*Fish, Vegetation*)  
Chloride is a growth inhibitor

**DRINKING WATER**  
High chloride levels found in local groundwater

## SMART SALTING FOR PARKING LOTS & SIDEWALKS

*Specifically created for the snow contractors*

Presented by  
Ninja De-Icer & WI Salt Wise

August 24<sup>th</sup> | Eau Claire

September 7<sup>th</sup> | Wausau

October 5<sup>th</sup> | Madison

November 2<sup>nd</sup> | Milwaukee

Register at  
[www.wiSaltWise.com](http://www.wiSaltWise.com)

WHAT CAN YOU DO?

## FOCUS ON THE 3 RIGHTS

- ✓ **RIGHT PRODUCT**  
Treated Salt and Liquid De-Icers
- ✓ **RIGHT AMOUNT**  
Application Rates, Equipment Calibration
- ✓ **RIGHT TIME**  
Anti-Icing and De-Icing Decision Charts

IDENTIFY YOUR **3 RIGHTS**.

CALL NINJA DE-ICER TODAY! **833-SALT-GUY (725-8489)**



# DEMYSTIFYING CHLORIDE DEICERS

By Allison Madison, WI Salt Wise

Chloride-based deicers are the most common ice melters on the market. Also common is misinformation about the effective melting temperatures and safety of these products. There are no truth-in-labeling requirements for deicers, so it's important to educate yourself and use common sense.

Chloride is corrosive and environmentally toxic. Chlorides accumulate in the environment, degrading drinking water quality and negatively impacting plants and animals. This is true of all chloride products. No chloride-based deicers are "pet-friendly" or "environmentally-friendly."

## NaCl

### YOUR CHEAPEST OPTION

Sodium chloride, because it is the least expensive, is the most common deicer and the base of most blended products. Sodium chloride (NaCl) is often called rock salt because it is mined as a solid rock and minimally processed for use in winter maintenance. Table salt is also sodium chloride (NaCl), but it requires additional processing to make it food grade. The removal of impurities increases the cost.

## MgCl<sub>2</sub> & CaCl<sub>2</sub>

### LOWER MELTING TEMPS

Magnesium chloride (MgCl<sub>2</sub>) and calcium chloride (CaCl<sub>2</sub>) are naturally present in the liquid form. The removal of excess water, which occurs in giant evaporation ponds, takes time and makes them more expensive. The big advantage of these salts is their lower effective melting temperatures, but their higher price points and hygroscopic nature means that you need to use them wisely.

### HYGRO-WHAT?

We're all familiar with the ability of salt to clump when exposed to moisture. On a humid day, table salt might clump in the salt shaker. Chloride salts clump because they are effective at absorbing water vapor from the surrounding air. If they attract enough water vapor, the water vapor turns to liquid water, the salt partially dissolves, and clumps form. This ability to absorb water from the air means that chloride salts are hygroscopic.

### HYGROSCOPIC FOR THE WIN!

Calcium chloride and magnesium chloride are often used as dust suppressants on gravel roads because they are highly hygroscopic. They can capture moisture from the air and keep dust levels down. Being hygroscopic seems great, right?

### HYGROSCOPIC SALT + HIGH HUMIDITY = DANGER ZONE

Unfortunately, in the winter, the ability to absorb moisture from the air and concentrate it on the pavement surface is not a desirable trait. If you apply calcium or magnesium chloride when the humidity is too high, you may create a sticky mess or, worse yet, a refreeze event if temperatures continue to drop.

### CONCLUSION

Always remove as much snow and ice as you can mechanically. Chlorides weaken concrete, brick and stone, damage vegetation, and wash into waters putting aquatic life and freshwater resources at risk. Using the right amount of the right material at the right time saves you money and limits damage to hardscaping, landscaping, and freshwater resources.

Chemical Formula	NaCl	MgCl <sub>2</sub>	CaCl <sub>2</sub>
Full Name	Sodium Chloride	Magnesium Chloride	Calcium Chloride
Effective Working Temperature	15 F	-5 F	-15 F
Relative Metal Corrosivity	High	Very High	Highest
Relative Concrete Corrosivity	High	Highest	Very High
Environmental Toxicity	High	High	High

"Alternative Methods for Deicing." Clear Roads Report, May 2020.

"Corrosion of Deicers to Metals in Transportation Infrastructure: Introduction and Recent Developments." Corrosion Reviews, May 2009.

"Investigation of Materials for the Reduction and Prevention of Corrosion on Highway Maintenance Equipment." Iowa Highway Research Board Report, May 2009.



# HOW TO MAKE YOUR OWN SALT BRINE FOR SNOW AND ICE REMOVAL

By Justin Rollin, Ninja De-Icer

**W**hat is salt brine made of? Mainly sodium chloride and water, which makes it an effective snow and ice management solution for parking lots and roads. Its freezing point is lower than pure water, which reduces the adhesion of snow and ice to road surfaces and pavement. Most businesses purchase brine in bulk, but if reducing costs is needed, it's possible to produce your own. Here's how to make salt brine for commercial snow removal.

## WHAT IS SALT BRINE?

Salt brine solution isn't only salt; it's a combination of salt and water that's designed to be sprayed on pavement such as walkways, parking lots, and roads as it helps to melt ice and keep the surface safe.

You might be wondering what is in salt brine and how to make your own salt brine for ice melting. If you are hoping to make your brine, it's important to find the right balance between water and sodium chloride as there needs to be a chemical reaction between the two. There are many companies that also use magnesium chloride and calcium chloride as additives to make salt brine that much more effective at melting ice and snow. Liquid brine solution and liquid de-icer have a lower freezing temperature compared with water due to the salt component, making it ideal to use as an anti-icing component.

## THINGS TO CONSIDER WHILE MAKING SALT BRINE FOR MELTING SNOW

Before learning how to make salt brine, you need to consider your business needs, capabilities, and health hazards that DIY production may bring. The scale of your deicing requirements will ultimately affect logistics and narrow down options.



## CHOOSE THE RIGHT BRINE MAKER

Contrary to what people think, making salt brine involves more than mixing salt with water. During winter months, heavy snow removal can be a continuous process, requiring a significant amount of liquid brine, which is why most municipalities and businesses going the DIY route invest in an automated brine maker.

Always research products and obtain a thorough understanding of your company's water production capability before purchasing a brine maker. It's pointless buying high-output equipment if you can't supply the maker with sufficient gallons per minute.

Brine makers with remote capabilities are conveniently operable from mobile devices, laptops, and tablets. Those made from fiberglass tend to offer the best longevity against salt's corrosive effects. If you have the capability, opt for a powerful pump that can produce thousands of gallons per hour, decreasing manual labor.



## CONSIDER FACILITY CAPABILITIES

Even with the right water system capabilities, making salt brine for melting snow requires storage and loading space. To give you an idea, some commercial tanks can be as big as 30 ft<sup>3</sup>. In addition to storage space, you'll also need to consider that all automated brine makers require pumps, so where and how these will be placed requires some planning.

Moreover, brine makers also have to be periodically cleaned. This may be as simple as opening a valve and pressing a button, entailing disconnecting components and tipping the tank over, or even getting into the tank and shoveling the build-up out. Each system is different, so be certain you know exactly what the cleaning requirements are.

If you don't have the right infrastructure, it might not be worthwhile investing in a maker. Commercial salt brine manufacturing requires careful logistics planning to make a good ROI. Not having enough space for storage or traffic can compromise your efforts.

## HOW TO MAKE SALT BRINE FOR DEICING

Perhaps your business doesn't require the mass production of salt brine, in which case you can produce your own. There are many recipe variations, depending on your needs. Most homemade solutions can be stored in bottles and sprayed on ice as needed. Typically, salt brine should be applied before it snows.

## FOLLOW THESE SIMPLE STEPS TO MAKE A SALT BRINE SOLUTION FOR DEICING

### STEP 1 PREPARE THE INGREDIENTS

Regardless of the quantity, you'll need water and rock salt in an approximate ratio of 4-to-1. It's always advisable to use water because it increases the solubility of the salt, causing it to dissolve at a quicker rate. You'll also want to wear safety glasses to protect your eyes.

### STEP 2 MIX SALT AND WATER

Mix the salt and water in a brine maker to ensure all the salt dissolves. Once your mixture is dissolved, test the solidity using a hydrometer to ensure it is at the consistency of 23.3% (salt to water ratio). In addition, to

increase deicing potency, you can add calcium chloride, potassium chloride, magnesium chloride, and calcium magnesium acetate.

### STEP 3 PREPARE THE SURFACE

Pre-wet the pavement to prevent ice from bonding to the surface or spread the solution on the ice, which will slowly break into fragments and dissolve. Salt brine is most effective before or after snow removal, so you may need to remove the loose snow first.

## COMMON CHALLENGES TO CONSIDER

### WATER FLOW

There are many different brine makers and it is important to know how much water you can obtain in terms of gallons per minute. It won't be beneficial to have a model with high output if you don't have the ability to feed that much water into it. Having a good understanding of your current situation can help you determine the type of brine maker to purchase and whether it's worth it to increase the flow. You'll want to invest in a system that works for your particular facility's capabilities.

### FACILITIES AND PUMPS

In addition to knowing the limits of your water system, you'll want to be aware of how the brine ingredients will be delivered and stored. You'll also want to understand how the finished products will be loaded. Although logistics might not seem important, a lack of logistics can cancel out the efficiencies that stem from making your brine.

You'll also want to think about where the pumps are located and that they have the right ratings and seals.

### BRINE MAKER CLEAN OUT

Another factor is what it will take to clean the system as you'll need to do so regularly. The cleaner you keep the brine maker and the better you're able to remove insoluble materials, the more productive it will be. Even a process as simple as opening a valve and pushing a button is possible compared with other models that require additional steps.

## CONCLUSION

Learning how to make salt brine isn't easy, and for some the effort required to make large amounts of salt brine isn't worth the money saved. At Ninja De-Icer, we have several options of reasonably priced salt brine and liquid deicers available for purchase.

## APPLICATION AMOUNTS

Gallons Per Acre	Lbs. Per Acre @ 23.3 Salt Brine
40	92 lbs.
50	115 lbs.
60	138 lbs.
70	161 lbs.
80	184 lbs.
90	207 lbs.
100	230 lbs.

(Source: Langton Group)





# WHY USE BRINE?

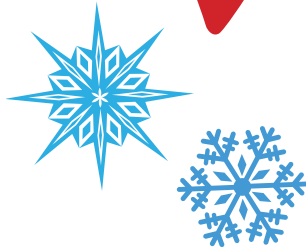
## BENEFITS OF LIQUID BRINE

Liquid de-icers are an amazing ice battling tool. When applied to parking lots, roads, sidewalks, or driveways the liquid doesn't bounce around like the salt crystals from rock salts.



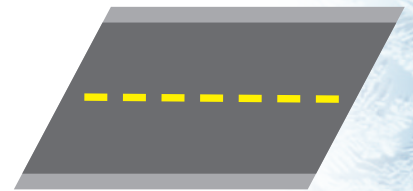
**SALT BRINE**  
23.3% Salt & Water

BRINE WORKS **FASTER** THAN SOLID SALT.



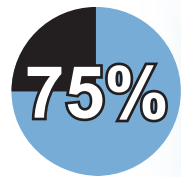
APPLIED BEFORE THE STORM. IT **PREVENTS** SNOW FROM **STICKING** TO PAVEMENT.

LIQUID MATERIAL **STAYS IN PLACE.** WORKING WHERE IT'S NEEDED.



LESS TOTAL SALT MEANS **LESS DAMAGE** TO CONCRETE, METAL AND LANDSCAPING.

Reduces Salt Use By



### LIQUID BRINE APPLICATION RATES

Anti-Icing Application Rates (*pre-storm*): 20-50 gallons/acre  
De-Icing Application Rates (*post-storm*): 70-100 gallons/acre

#### Some Factors Influencing Rates:

- ▶ Pavement Temperature
- ▶ Levels of Traffic
- ▶ Timing Factors





# CONSULTING SERVICES

With over 25 years of experience in the snow industry, we have a diverse background in sales and operations. We have worked with private contractors and public works departments. In addition, we have helped corporations review their snow contracts and save them money.

## SERVICES WE OFFER INCLUDE:

1

### EDUCATIONAL TRAININGS

- ▶ **Deicing Materials and Applications** - Review and discuss the Right Product, Right Amount, and Right Time to apply deicing materials.
- ▶ **Salt Efficiencies** - Review of how to use deicing products more efficiently so you are using less product and saving money.
- ▶ **Liquid Deicers** - How to get started and effectively use liquid deicers.
- ▶ **Calibration of Equipment** - For both solid and liquid materials.

2

### CONTRACT REVIEW & DEVELOPMENT

- ▶ Review existing contracts and give suggestions for win-win language, comparison to best practices, potential level of risk, and understanding of performance requirements.
- ▶ Assist with new contract development.
- ▶ Identify areas in contracts for potential financial savings.

3

### BILLING REVIEW & AUDIT

- ▶ Review and evaluation of invoices to help determine if accurate and appropriate levels of services were utilized.

## POTENTIAL CUSTOMERS WHO WOULD BENEFIT FROM THESE SERVICES:

- ▶ Municipalities
- ▶ Commercial Snow Contractors
- ▶ Large Corporations



# **TRADITIONAL BULK SALT**

This product is traditional white rock salt. It is coarse screened, sodium chloride salt obtained from underground bedded salt deposits extracted by physical mining.

**CHEMICAL COMPOSITION:** Sodium Chloride

**EFFECTIVE TO:** 5°F

**COLOR:** White



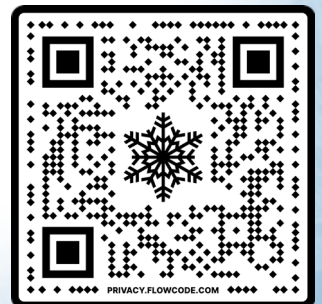
## **BENEFITS**

- ▶ More cost-effective than buying bagged rock salt
- ▶ Control your product supply
- ▶ Better seasonal planning



**CALL US TODAY  
FOR A QUOTE!**

**833-SALT-GUY (725-8489)**





# TREATED BULK SALT

TREATED BULK SALT

## Benefits of TREATED SALT

- ▶ **Use Less Product: 23.6% less versus traditional bulk salt**
- ▶ **Effective at Lower Temperatures: 0°F to -25°F depending on product**
- ▶ **Up to 70% Less Corrosive**
- ▶ **Jump starts the Melting Process- Melts Ice Faster**
- ▶ **Penetrates into the ice deeper**
- ▶ **Stockpiles won't clump or freeze**

## About Our Best Bulk & Treated Salt Products

We offer rock salt in enormous quantities of standard and treated salt to ensure you're stocked up all winter long. Apply after plowing for an ice-free finish. Our bulk salt products help to melt away snow and ice and keep it from reforming.

With proper application, your clients will be safe, happy, and free from the risk of slip-and-fall incidents on their parking lots and sidewalks. Traditional bulk salt and treated bulk salt are also available in one-ton super sacks for cost-effective smaller-scale commercial and industrial applications.



[sales@ninjadeicer.com](mailto:sales@ninjadeicer.com) • 833-SALT-GUY (725-8489)



# BAGGED SALT

At Ninja De-Icer, we offer a variety of bagged de-icing products to fit your needs.

Scan code to see all bagged product options.



## ADVANTAGES

- ▶ Easier outside storage with our UV protection packaging.
- ▶ More options of product types based on chemical composition, effective temperature, etc.
- ▶ More convenient to handle and load.



Ice Away Rock Salt  
5°F



Rock Salt (Halite)  
5°F



Royal Blue Halite  
Rock Salt  
5°F



Thunder Melt  
Ice Melter (Calcium Blend)  
-16°F



Lightning Fast®  
12lb Shaker Jug  
-20°F







**Lightning Premium Ice Melt (Magnesium Blend)**  
-20°F



**Sizzle Premium Ice Melt (Calcium Blend)**  
-25°F



**Peladow™ Calcium Chloride Pellets**  
-25°F

**DO YOU WANT TO KNOW HOW MUCH PRODUCT YOU NEED FOR THIS SEASON?**



SCAN THIS QR CODE FOR OUR PRODUCT ESTIMATOR

**De-Icer Seasonal Product Estimator**

Step 1: Select Coverage Area Measurement	Square Feet
Step 2: Enter your Coverage Area	2500
Step 3: Number of Events per Season	15
Step 4: "Effective To" Temperature (Low Temp)	-10°F
Step 5: Confirm Product Category	Bagged
Step 6: Select your Product	Magnesium Chloride (Sidewalk Blend): 50 lbs (-20°F)
Step 7: Rate of Application	Standard

Secure this amount from Ninja De-Icer: **16.34 bag(s)**

*\*\*\*Note: This is a guide. Other options may be available. Contact us at sales@ninjadeicer.com to explore other options.\*\*\**

**CALL FOR A QUOTE**

**STARTING AT \$4.26 PER BAG**

**sales@ninjadeicer.com • 833-SALT-GUY (725-8489)**



# BAGGED SALT INFORMATION CHART



PRODUCT	EFFECTIVE TEMP	PRODUCT DESCRIPTION	COLOR	Size of Bag	NO. OF BAGS PER PALLET	PRODUCT FEATURES
Ice Away Rock Salt	5°F	Sodium Chloride	White	50 lbs	49 Bags - 18 Pallets/TL	An economical choice, rock salt is made of chunky halite crystals that work quickly and efficiently. Best used in parking lot applications.
Halite Rock Sale	5°F	Sodium Chloride	White	50 lbs	49 Bags - 18 Pallets/TL	An economical choice, rock salt is made of chunky halite crystals that work quickly and efficiently. Best used in parking lot applications.
Winter Melt Rock Salt	5°F	Sodium Chloride	White	10 lbs 25 lbs 50 lb	56 Bags - 18 Pallets/TL 100 Bags - 18 Pallets/TL 49 Bags - 18 Pallets/TL	Has a unique size mixutre of large and small crystals for speed and longevity.
Royal Blue Halite Rock Salt	5°F	Sodium Chloride	Royal Blue	50 lbs	49 Bags - 18 Pallets/TL	A unique blend of small and large crystals. Rock salt that is dyed blue for easy application and that is treated with a special anti-caking agent to prevent the product from clumping or hardening over time.
Green Melt Ice Melt Blend	-5°F	Sodium Chloride & Calcium Chloride Blend	Green	50 lbs	49 Bags - 18 Pallets/TL	Has a special blend for quicker melting action along with a green tint to make application easy to see.
Jiffy Melt Ice Melt Blend	-10°F	Sodium Chloride & Magnesium Chloride Blend	White	12 lb Jug 20 lbs Bag 40 lbs Bag	180 Jugs - 18 Pallets/TL 120 Bags - 18 Pallets/TL 63 Bags - 18 Pallets/TL	Contains a specially formulated blend for quickly melting action at lower temperatures.
Thunder Melt Ice Melter	-16°F	Sodium Chloride & Calcium Chloride Blend	Purple	50 lbs	49 Bags - 18 Pallets/TL	A unique blend of ASTM-1 grade rock salt treated with calcium chloride, organic carbohydrate, and a corrosion inhibitor coating. Melts faster and longer than plain rock salt allowing for reduced application rates. Purple color for improved visual spreading.
Lightening Premium Ice Melter	-20°F	Sodium Chloride & Magnesium Chloride Blend	Aqua	25lbs 50lbs	100 bags - 18 Pallers/TL 49 Bags - 18 Pallets/TL	Premium sized sidewalk salt crystals treated with magnesium chloride, organic carbohydrate, and a corrosion inhibitor that can be used in the coldest temperatures. Designed to melt quickly but still have a long lasting residual effect. Aqua color for improved visual spreading. Safer for pets, sidewalks, plants, and equipment.
Lightening Fast Ice Melter	-20°F	Sodium Chloride & Magnesium Chloride Blend	Aqua	12 lb Jug	160 Jugs - 18 Pallet/TL	A proprietary blend with a corrosion inhibitor. Safer for pets, concrete, plants, and equipment. Smaller sized crystals for reduced abrasion to pet paws. Comes in a easy to use jug with a shaker lid.
Sizzle Premium Ice Melter	-25°F	Sodium Chloride & Calcium Chloride Blend	Pink	50 lbs	49 Bags - 18 Pallets/TL	Premium dry blend consisting of a blend of calcium chloirde pellets and premium sized salt crystals. This blend is pinkish in color for easier application and the to reduce the risk of over application. Quick burn allows for advanced melting stages during extreme weather.
Dead Sea Mag	-13°F	Magnesium Chloride Pellets	White	50 lbs	48 Bags - 18 Pallets/TL	Naturally harvested straight from the Dead Sea. The unique pellet shape can be advantageous due to its ability to bore into the snow/ice. Safe for concrete, people, pets, and the environment. It's 3 times less toxic than conventional table salt.
Peladow	-25°F	Calcium Chloride Pellets	White	30lbs 50 lbs	91 Bags - 16 Pallets/TL 55 Bags - 16 Pallets/TL	Ideal for sidewalks, driveways, and parking lots. The pellet shape is designed to bore through snow/ice faster than traditional products. Generates its own heat resulting in fast-melting action.



# HYDRAULIC-RUN SPREADER CALIBRATION

NH Best Management Practices



## Step 1: Load the Truck

Partially load the truck. Half of a full load should be more than adequate for calibration purposes.

## Step 2: Set Your Controls

**Gate Height:** Set the gate height to its lowest practical setting (~ 2"). This should be kept constant throughout the calibration process. If you find that not enough material is dispensed with this setting, try 2.5" to 3".

**Engine Speed:** Warm the truck up and run the engine at the typical rate seen during spreading (approximately 2000 rpm).

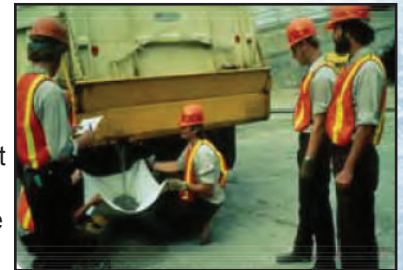


## Step 3: Measure Spread Width

Measure the width that the material covers during spreading. Do this for each conveyor/auger setting you are calibrating. Round your numbers to the nearest half foot and record them in column "W" of the calibration chart.

## Step 4: Collect & Weigh Material

You will need either a sheet of canvas, a tarp, or a bucket to collect the material that is dispensed from the spreader, as well as a scale. Weight the object you are using to collect the material in, and record that value in the purple box above the discharge rate column. Collect material for 1 minute. Weigh the collected material and subtract the weight of the tarp/canvas/bucket. Record this value in the first purple column of the calibration chart. Do this 3 times for each conveyor/auger setting that is typically used. Average these three values together and record in the orange column in the calibration chart.



## Step 5: Perform Calculations

Go inside and calculate your discharge rate using the calibration chart for each truck speed and conveyor/auger setting you normally use. Refer to the reverse side of this fact sheet for calculation instructions. The formula you will be using is shown below:

$$D = \frac{B \times C}{A}$$

## Step 6: Distribute Completed Calibration Cards!

Put a copy of the calibration chart in the truck you just calibrated. Also, leave a copy of the calibration chart in the office so you have a copy in case the original is damaged.

Produced in partnership with:



## WHY CALIBRATE?

You can't reduce your salt use if you don't know how much salt you actually use! The goal of calibrating is to know how much material you are putting down on a roadway or parking lot for every setting on your truck that you use. This is why calibrating your equipment is the first step to reducing salt use and saving money!

## REMEMBER:

Each truck must be independently calibrated for each material it will be used to spread (*the salt calibration chart will be different than the sand calibration chart*).

*Calibrations should be performed annually, or after a spreader is serviced.*







# LIQUID PRODUCTS



## HEADWATERS® HOT LIQUID ADDITIVE

### THE HOTTEST NEW BRINE ENHANCER

Combined the corrosion protection of the proprietary, clean, bio-based Headwaters • Corrosion Inhibitor with the melting power of highly concentrated calcium chloride to create Headwaters® • HOT- the ideal new ultra-efficient salt brine performance enhancer.

With a class leading addition rate of 10-19% by volume, Headwaters® HOT transformed straight brine into "HOT Brine", a high-power, clean, and environmentally friendly deicer that maintains the unbeatable cost-effectiveness of salt brine.

Headwaters® HOT is available nation-wide via rail car, bulk tanker or 275 Gallon Totes – providing the perfect solution to any State DOT, Municipality or commercial deicing operation across the US.

#### Environmentally friendly

- ✓ Bio-based and devoid of harmful contaminants
- ✓ Biodegradable: extremely low Bio Oxygen Demand (BOD)
- ✓ Reduces overall chlorides released to the environment

#### Clean and free-flowing

- ✓ Colorless, Odorless, clean, natural and consistent
- ✓ It won't clog nozzles or cause messy tracking issues

#### Use up to 30% less brine

- ✓ Increased melting capacity means less brine required

#### Melt up to 57% more ice at 0°F

- ✓ Extend the working temperature range of brine

#### Reduce corrosion by 70%

- ✓ Protect your vehicles, equipment and infrastructure, without sacrificing melting performance

#### Longer lasting residual product

- ✓ Decrease run-off and leave longer lasting residual product that sticks to the road, increases friction, and reducing the need for re-application.

#### Clear roads QPL Listed

- ✓ Category A-3: Best in Class addition rate of 19%

## HEADWATERS® SF40 LIQUID DE-ICER

100%  
CHLORIDE  
FREE

HEADWATERS®  
SF40

Headwaters® SF40 is a complete, non-chloride solution that perfectly balances performance, environmental impact and cost.

Headwaters® SF40 is a corrosion inhibited sodium formate solution, which is both **HIGHLY EFFECTIVE AND EXTREMELY ECO-FRIENDLY**- as it is readily bio-degradable.

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## DE-ICE MASTER+ LIQUID DE-ICER



**De-Ice Master+ is a premium blended calcium chloride liquid deicer/anti-icer with corrosion inhibitor Ice Ban that melts to  $-25^{\circ}\text{F}$  and below!**

### Why De-Ice Master + is effective:

- ◆ De-Ice Master + melts ice and snow in temperatures as low as  $-25^{\circ}$
- ◆ Use as a pre-wetting agent on salt spreaders to significantly reduce bounce & scatter of bulk materials during application and lower melt temperature of salt
- ◆ Pre-storm direct application on roads helps prevent surface bonding of ice and snow, allowing for cleaner & quicker snow removal
- ◆ Treat stockpiles to keep materials free flowing
- ◆ Reduce salt usage by as much as 40%
- ◆ Less Salt! Less Labor! Increased Efficiency!
- ◆ Easily blends with most products!
- ◆ Cost competitive versus other corrosion inhibited products

## MINERAL WELL BRINE LIQUID DE-ICER & ADDITIVE



**Mineral Well Brine is a calcium chloride product that is obtained from one mile below ground and has a freeze point of  $-25^{\circ}\text{F}$  or lower.**

### Why Liquid Calcium Chloride is effective:

- ◆ Reacts with snow and ice upon application with faster melting than rock salt, potassium chloride or magnesium chloride.
- ◆ Many government agencies and commercial snow and ice removal professionals have endorsed its use as an effective pre-wetting, anti-icing and de-icing agent.
- ◆ Many rock salt blends are ineffective at temperatures below  $20^{\circ}\text{F}$ . Liquid Calcium Chloride melts ice and snow in temperatures as low as  $-25^{\circ}\text{F}$ .
- ◆ Easily blends with other products and does not diminish their performance, making them even more environmentally safe.
- ◆ Can be used as a stand alone product or mixed with salt brine to improve performance.

### Why Use Liquid Calcium Chloride for Winter Ice Control?

- ◆ Improved road and parking lot maintenance service. Prevent ice bonding to pavement.
- ◆ More effective anti-icing & de-icing with ability to melt snow & ice as temperatures plunge.
- ◆ Reduce environmental impacts of oversalting causing ground water contamination.
- ◆ Lower overall ice and snow melting costs.



# HELPFUL TERMS

## Snow Professionals Should Know

### SALT BRINE

Rock salt (sodium chloride) dissolved in water. For the purpose of deicing, it's important that your salt brine has a salinity of 23.3%. At this salinity rate, salt brine has no shelf life and will remain a solution forever.

### EFFECTIVE TEMPERATURE VS. EUTECTIC TEMPERATURE

There is no standard definition for Effective Temperature. It is more of a subjective range depending on how much snow/ice you need to melt, the surface temperature, and how fast you want it to melt. Eutectic Temperature is based on science, in that the chemicals in the products will not work below a certain temperature. (For Example: Rock Salt- Sodium Chloride. Effective Temperature: 15°F. Eutectic Temperature: -6°F.)

### ENDOTHERMIC

Draws heat from its surroundings to create the change from the granular salt into a liquid salt brine mixture. (Sodium Chloride works this way)

### EXOTHERMIC

Gives off heat which makes them work much faster. (Magnesium and Calcium Chlorides work this way)

### HYGROSCOPIC

Absorbs moisture from the air. All chlorides have hygroscopic properties, however calcium and magnesium chlorides are much more hygroscopic than traditional rock salt (sodium chloride). That's why using sodium chloride in high moisture events is more effective than other chlorides.

### ANTI-ICING

A proactive strategy to prevent snow and ice from bonding to the surface. Anti-icing can be done before, during, or after a storm by using a liquid deicer product. However, once the snow and ice has started to stick to the surface, you need to switch to a de-icing strategy.

### DE-ICING

A reactive strategy of applying a granular deicer product to snow and ice that has already bonded to the surface to help break up that bond.

### PRETREATING SALT

This is when you apply a liquid additive to a stockpile of rock salt to improve the effectiveness at lower temperatures. You mix the liquid additive with the granular salt so it becomes a liquid coated salt (or treated salt). Using treated salt can reduce your salt application rates by up to 40%.

### PRE-WETTING SALT

This is where a liquid deicer is applied to the granular rock salt at the spinner as it is dispersed to the surface. By wetting the rock salt, it starts the chemical reaction as it lands on the surface and will start to work more quickly.





# USING WEATHER INFORMATION IN WINTER OPERATIONS

Wilfred Nixon, Professional Snow Fighters Association

It is obvious that the weather impacts winter maintenance operations – if it snows, we have work to do! So, in that regard, it is fair to say that weather information helps us in our maintenance operations. But what sort of information is going to be most helpful to those operations and how can we access that sort of information at an appropriate cost level.

First, let's consider what we need to know. We want to know if winter weather (that could be snow, freezing rain, or even just frost) is going to happen. We would like to know when it is going to start, how long it will last, whether any snow will accumulate and if so, how much, and whether we are likely to see slippery conditions developing. Those are quite specific questions (and we may have more) so where can we best find them?

In general, the best, most detailed global weather models are run by State level meteorology organizations – here in the U.S. that is the National Weather Service (NWS). However, that does not mean that they provide the best answers to our questions. For example, the NWS is primarily focused (by legislative action) on aviation weather rather than road weather. It does not provide the critical information needed to determine whether we are likely to see slippery conditions developing (more on that below). It does provide excellent information on weather in general and how various weather conditions move across the country. You might think that would mean that it provides good answers to when a storm is going to start, but again, that is not its focus (in terms of winter weather anyway – it is very different with severe summer storms). So, an NWS forecast might talk about snow starting in Eastern Iowa (where I live) “over the evening hours.” First, what time is “the evening hours” and second, where in Eastern Iowa will that snow be? Most likely the storm is

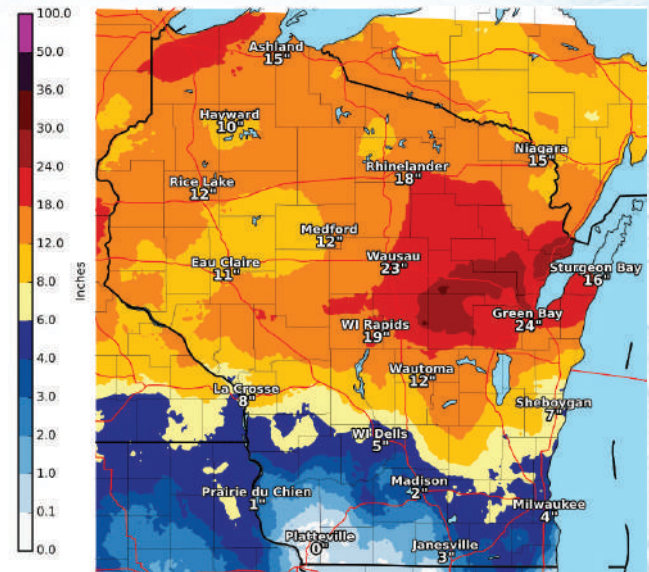
progressing from West to East so the more western parts of Eastern Iowa will see the snow first, but when? And more importantly, when will I see it starting?

There are specific challenges associated with forecasting and tracking winter storms not least of which is how snow does not reflect radar as well as rain does. However, these are not the reasons why the NWS weather forecast is less useful than it might be. The real issue is that it is focused on too large an area. I might be looking for information for my town or city, but the NWS cares about things on the scale of states, or big parts of states.

So, if the NWS is not ideal, what about the media, or even the weather apps that are so numerous these days? Well, more likely than not their forecasts are based on the NWS or their local equivalent, primarily because modeling the weather to create a forecast takes a truly stupendous amount of computing power. And again, these forecast sources do not have the information to create good information about those slippery conditions.

**What does it take to get good information on the road condition, slippery or not?** The primary piece of information is the pavement temperature. Let's be clear, a lot of people (including NWS) will talk about surface temperature, and you might assume that is the temperature at the surface – in other words, on the pavement. It is not! **When the NWS and the equivalent talk about surface temperature, they are talking about the air temperature at about 6 feet (specifically at 2 meters) above the surface.** Not much use if you want to know the temperature of the pavement, where things might or might not be slick...

**How can you get information about pavement temperatures?** Well, there



are two ways. First, you can get **sensors that can be placed to measure the pavement temperature conditions.** Lots of agencies have these, and some of them make the information from them available to anyone to see whenever they want. The Iowa Department of Transportation does this, for example (see <https://data.iowadot.gov/maps/lowaDOT::weatherview/about>). So, you can perhaps find out the pavement temperature near you by using someone else's sensors. Or you can get your own, and again many agencies mount such temperature sensors on their trucks. This tells you what conditions are now. To get a sense of what conditions might be, you will need a special, pavement temperature forecast. These are known as a **Value Added Meteorological Service (VAMS)** and as the name implies, they may cost you some money. But, they will give you all those bits of information we mentioned above (when will the storm start at my location, and so forth) and can tailor that information to your specific needs (some will provide a warning service so that if certain weather conditions are met, like frost being predicted, you will receive a warning text, for example).

There is an old saying when it comes to information – GIGO (garbage in, garbage out). The other side of that saying is that if you want to make good decisions, you need the best possible information (not nearly as pithy as GIGO!). So, to make good decisions in your winter maintenance operations, get the best weather information that you can afford.





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# PRE-SEASON

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