

MN/DOT

WINTER CHEMICAL CATALOG

OFFICE OF MAINTENANCE



October 2015

De-Icing Chemicals and the Environment

MN/DOT does not endorse any product in this document

This is for informational purposes only

MnDOT operates under a high expectation to balance safety, mobility, environmental and budgetary priorities. In order to mitigate environmental impacts, provide safe winter driving conditions and maintain mobility during winter storm events, MnDOT employs a variety of strategies and materials to help keep the roads clear while continually striving for more effective and efficient use of all types of snow and ice treatments on our roadways.

Surface Water

Lakes normally mix or turn over twice each year, in the spring and fall. This mixing brings oxygen to the deepest water and moves nutrients throughout the water column. Chlorides can cause lakes to stratify; chloride contaminated water is more dense than fresh water so it sinks. This dense layer of water at the bottom of the lake can prevent mixing from occurring as it normally should. This reduction in mixing can result in low oxygen levels in deepest water which is also fish habitat. Fish and aquatic organisms cannot survive in water with high chloride content. High salinity may also interfere with the growth of aquatic vegetation. Researchers at the University of Minnesota speculate that if we completely stopped using chlorides for deicing, our lakes would eventually flush and return to more normal chloride levels.

Ground Water

75 % of Minnesota's drinking water comes from ground water. Unlike surface water, our aquifers do not have the ability to flush as easily. Researchers are unsure how long it would take for chloride levels to return to normal.

NaCl, Sodium Chloride

Sodium Chloride, NaCl, is the most commonly used deicing chemical. Other chemicals used include, Magnesium Chloride, (MgCl₂) and Calcium Chloride, (CaCl₂), Acetates, and various blends of different chemicals. These materials can be harmful to the soils, plants, animals, fish and water.

Sodium, (Na⁺)

When sodium is introduced to our soils, it causes clay particles to expand and swell, plugging soil pores. This reduces soil permeability and adds to greater compaction of our roadside soils. This compaction reduces water infiltration and slows root growth. Weeds, such as Canada Thistle, thrive in these poor soil conditions and native plants struggle to become established.



Chloride, (Cl⁻)

Chlorides, (Cl⁻) are harmful to surface and ground water. Once chloride ions attach to water molecules it is difficult to remove them. Reverse osmosis filtration, electro dialysis and distillation, are three processes that will reduce the chloride content of water. The chronic standard set by the EPA for chlorides in surface water is 230 mg/L.

Magnesium Chloride, (MgCl₂)

Magnesium chloride is highly soluble in water. When dissolved the compound disassociates (separates) into magnesium and chloride ions. Magnesium is an essential plant nutrient.

Calcium Chloride, (CaCl₂)

Calcium chloride is highly soluble in water. When dissolved the compound disassociates (separates) into calcium and chloride ions. Calcium is an essential plant nutrient.

Acetates

See Organic Additives

Organic Additives/Corrosion Inhibitors

Most of the MgCl₂ and CaCl₂ deicers used, contain an organic additive such as corn molasses or beet juice added as a corrosion inhibitor. These additives are also nutrients.



Vendor Contacts

**MN/DOT does not endorse any product in this document
This is for informational purposes only**

Always contact the vendor of any product for recommendations before purchase or use

Tiger Calcium Services (Green Touch Systems)

Matt Friedrich 612-481-8731 Matt@greentouchsystems.com

- Road Guard Plus 8
 - TC Econo
-

Envirotech Services

Tom Broadbent 218-834-9449 Tbroadbent@envirotechservices.com

- Ice Slicer
 - LCS concentrate
 - C1000
 - S.O.S -C
 - S.O.S
 - Meltdown APEX -C
 - Meltdown APEX
-

North American Salt Co. (Compass Minerals)

Sean Lierz (Granular) 913.344.9330 LierzS@compassminerals.com

Steve Laliberte (Liquids) 218-740-5136 LaliberteS@compassminerals.com

- Freezgard CI Plus

Cryotech De-icing

Tony Myhra 218-251-3911 Tony.Myhra@cryotech.com

- CF7
 - NAAC (pellets)
-

Smith Fertilizer

Steve Leeds 641-828-8500 SteveL@sfgiowa.com

- Beet55
-

Cargill

Roger Wilson 920-889-3583 Roger_Wilson@cargill.com

- Clearlane Enhanced De-icer





Scotwood Industries, Inc.

Mike Maphies 800-844-2022 Mmaphies@scotwoodindustries.com
• Ice Ban 200

SNI Solutions

Dan Freeman 563-506-8828 DanFreeman@snisolutions.com
• Geomelt 55
• Geomelt Gen 3

Rivertop Inc.

Jason Kiely 406-532-3262 Jason@rivertop.com
• Headwaters 10F
• Headwaters

Prairie Supply (Univar)

Chris Wehri 701-282-5656 Chris.Wehri@prairiesupply.com
• Ice Bite 55

For more information on the catalog contact:

Joe Huneke 651-366-3586/651-900-5300 Joseph.Huneke@state.mn.us
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Steve Blaufuss 612-216-9885 Steven.Blaufuss@state.mn.us



Product Title: **CF7**

Material Type: Granular Liquid

Vendor name: Cryotech Deicing Technology

Active Ingredient: Potassium Acetate

Vendor suggested use: Deicing/anti-icing highways, bridges, parking lots, and other pavements

Vendor suggested rate: For anti-icing, 25-60 gallons/lane mile. For deicing, 60-180 gallons/lane mile

Salt Brine Compatible: No compatibility issues when applied over pavement where salt brine has already been applied or vice versa. It is recommended not to mix salt brine and CF7 in storage tanks as solubility issues may occur.

Mixing/Storage Guidelines: Polyethylene or SS containers are preferred; otherwise use carbon or low alloy steel. CF7 should not be stored or plumbed through systems that use galvanized, zinc, or brass components. It can, however, safely be used on or around galvanized bridge and parking deck components, signage, and guardrails.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:

CF7 is non-persistent, readily biodegrades at low temperatures and does not contain nitrogen or chlorides. Low toxicity to fish, mammals, and vegetation. CF 7 is used in bridge anti-icing units across the state



- Product Title:** NAAC
- Material Type:** Granular Liquid
- Vendor name:** Cryotech Deicing Technology
- Active Ingredient:** Sodium Acetate 97%
- Vendor suggested use:** Deicing/anti-icing highways, bridges, parking lots, and other pavements.
- Vendor suggested rate:** Near 32°F, on thin ice, evenly spread 5-7 lbs/1000 sq. ft. Less than 10°F or on 1 inch ice, apply 10-25 lbs/1000 sq. ft.
- Salt Brine Compatible:** No issues expected.
- Mixing/Storage Guidelines:** Store in original containers, or in bulk. Avoid excess moisture which may cause caking. Preserve pellet integrity by not over-handling.
- Lowest working temp:** Contact Vendor

Additional Vendor Supplied Information:

Cryotech NAAC biodegrades quickly at low temperatures and has low toxicity to fish and mammals. It is less persistent in the environment than other solid deicers. NAAC is not a chloride and naturally exhibits low corrosion, particularly against steel. It is produced using a patented Unipel technology that ensures uniform shape and composition of each pellet. It is produced to a very tight size specification. This allows it to penetrate directly to the pavement; irregular shaped deicers penetrate laterally, inefficiently expending chemical energy before reaching the pavement.



Product Title: **BEET 55**

Material Type: Granular Liquid

Vendor name: Smith Fertilizer & Grain Company, Inc.

Active Ingredient: Carbohydrates (Sugar)

Vendor suggested use: Anti-icing, Deicing, Pre-wet, Stock pile treatment

Vendor suggested rate: Anti-Icing:: 40-80 gallons per lane mile. De-icing: 50-90 gallons per lane mile.
Stockpile: 5 gallons per ton of salt.

Salt Brine Compatible: BEET 55 can be blended with salt brine down to a 50/50 ratio. BEET 55 cannot exceed the amount of salt brine in the mixture.

Mixing/Storage Guidelines: When mixing BEET 55 with salt brine or any other chlorides, it is important to make sure that your blend ratios are where you want them to be. Having too much of one product than what is recommended can cause the mixture to perform at a level that is not desired. Since BEET55 is an agricultural product, it will settle out if it is not being used. To take care of the settling issues, we suggest that you agitate your product once every 30 to 40 days for an hour or so to ensure that product has been mixed thoroughly throughout the entire mixture. At the end of the season, it is perfectly fine to add salt brine to your remaining BEET 55 product down to a 50/50 blend to make the beet juice thinner and easier to pump when the next winter season rolls on in.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:

BEET 55 is an ecological friendly and economically smart product that can reduce corrosion levels and provide a longer residual than chlorides alone. BEET 55 is a very versatile product that can be blended at different ratios to achieve the working temperatures that fit your climate and situation. Although salt brine mixed with BEET 55 is the most inexpensive but yet effective mixture, BEET 55 can be blended into “super blends” that contain other chlorides such as calcium chloride or magnesium chloride to achieve less corrosion and quicker burns for ice and snow. Along with liquid application to roadways, BEET 55 as a stockpile treatment will help keep your rock salt on the roadways by providing a tacky texture to keep your salt where you need it decreasing scatter and bounce loss. On average, a 30% savings is recognized in the amount of road salt used in an application. BEET 55 as a stockpile treatment will also keep your salt free flowing when it is stored between events or even seasons, leaving no boulders that require much time and effort to break them apart.



Product Title: Clearlane Enhanced Deicer

Material Type: Granular Liquid

Vendor name: Cargill Deicing Technology

Active Ingredient: Sodium chloride & Magnesium chloride.

Vendor suggested use: Deicer

Vendor suggested rate: As with all chemical deicers, field application rates are highly dependent upon weather, temperature, and precipitation conditions. We recommend that ClearLane® Enhanced Deicer be applied initially at the same application rates that would be used for white salt under the given conditions and then gradually reduced as the user becomes comfortable and familiar with its performance. We have found that most customers can use 20-40% lower application rate compared to white salt with our previous ClearLane® Enhanced Deicer formula.

Salt Brine Compatible: Yes

Mixing/Storage Guidelines: To improve caking resistance and reduce run-off, it is recommended that the product be stored in a covered storage shed or tarped. Normal precautionary measures for the safe handling of deicers should be observed.

Lowest working temp: Contact Vendor



Product Title: Ice Ban 200

Material Type: Granular Liquid

Vendor name: Scotwood Industries Inc.

Active Ingredient: Liquid magnesium chloride + CI Plus Corrosion Inhibitor (the CI Plus Corrosion inhibitor is a proprietary formulation that is optimized to significantly reduce metal corrosion in winter conditions).

Vendor suggested use: A Multi-Use Product for snow and ice fighting program, ideal for Anti-Icing and De-Icing.

ANTI-ICING- Applied ahead of a storm event to prevent ice and snowpack from bonding to pavement.

DEICING/PREWETTING – Used in the application of materials (salt and abrasives) during and after a storm event.

STOCKPILE TREATMENT- Applied to a stockpile to help dry material work more efficiently at colder temperatures...reduces bounce and scatter.... Keeps material free-flowing.

Vendor suggested rate: Approximate 25-35 gallons per road mile.

Salt Brine Compatible: Yes

Mixing/Storage Guidelines: No mixing or diluting needed. It comes ready to use from plant. Store either in steel or poly tanks, inside or outside.

Lowest working temp: Contact Vendor





Product Title: **FreezGard CI Plus**

Material Type: Granular Liquid

Vendor name: Compass Minerals

Active Ingredient: Magnesium Chloride 28% w/ corrosion Inhibitor

Vendor suggested use: Anti-Icing, Pre-Wet or Stockpile treatment

Vendor suggested rate: Anti-icing 15-30 gal/ LM , Pre-Wet 6-10 gal/ ton , Stockpile Treatment 6 gal/ ton

Salt Brine Compatible: No

Mixing/Storage Guidelines: Application specific – Contact vendor for more information

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:

Reduces scatter during application. Coats all deicing media efficiently. As magnesium chloride absorbs moisture from air not recommended for long term storage in warm climates. Prevents salt piles from freezing or refreezing after application





Product Title: Ice Slicer

Material Type: Granular Liquid

Vendor name: EnviroTech Services Inc.

Active Ingredient: Sodium Chloride, Magnesium Chloride, Calcium Chloride, Potassium Chloride

Vendor suggested use: Ice Slicer is an effective stand-alone cold weather granular deicer. Ice Slicer will also increase the melting speed and lower the working temperature of white salt.

Vendor suggested rate: De-icing: 100 lbs-400 lbs/mile. *30-50% less than white salt

Salt Brine Compatible: Yes

Mixing/Storage Guidelines: Please store in a clean, dry area (preferably covered).

Lowest working temp: Contact Vendor



Product Title: **LCS Concentrate**

Material Type: Granular Liquid

Vendor name: EnviroTech Services Inc.

Active Ingredient: Proprietary Carbohydrates

Vendor suggested use: Upon delivery, LCS Concentrate should be diluted 50/50 with 23.3% salt brine. The finished LCS deicing liquid is made by blending the 50/50 solution 4:1 with 23.3% salt brine to achieve a 10% LCS to Salt Brine mix.

Vendor suggested rate: Final liquid: 10% by volume - LCS to 23.3% salt brine. Anti-icing application rates for LCS are 20% less than non-inhibited salt brine.

Salt Brine Compatible: Yes

Mixing/Storage Guidelines: A properly labeled “poly” or steel (preferably lined) tank. “Poly” Construction: Heavyweight, HDPE Resin such as Exxon Mobil HD8660 as used by Norwesco Tanks; which contains a UV inhibitor. Steel Construction: Unlined steel tanks are acceptable. For extended tank life & ease of cleaning coat interior with Carboline Plasite 7122, or 9133 over steel prepped per manufacturer's instructions.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:

A 10% LCS salt brine solution will resist “dusting” that is common with non-inhibited brines. This allows more time before refreeze occurs. LCS is applied at lower application rates and holds the road longer than standard salt brine.





Product Title: C1000 PRO

Material Type: Granular Liquid

Vendor name: EnviroTech Services Inc.

Active Ingredient: Liquid Calcium Chloride, Apex-C (proprietary corrosion inhibitor), carbohydrates and organic polymers

Vendor suggested use: Deicing & Anti-icing. (WARNING: We do not recommend anti-icing until precipitation has started to occur. Studies have shown that anti-icing on dry surface may reduce friction.)

Vendor suggested rate: Anti-icing: 20 -30 gal/lane mile (1-2 gallons per 1000 square feet). WARNING: We do not recommend anti-icing until precipitation has started to occur. Studies have shown that anti-icing on dry surface may reduce friction. Deicing: 30-50 gal/lane mile. Application method: pencil streams NOT fan sprayers recommended for deicing. Fan sprayers do not provide sufficient pressure to penetrate ice and may experience clogging issues.

Salt Brine Compatible: Yes

Mixing/Storage Guidelines: A properly labeled "poly" or steel (preferably lined) tank. "Poly" Construction: Heavyweight, HDPE Resin such as Exxon Mobil HD8660 as used by Norwesco Tanks; which contains a UV inhibitor. Steel Construction: Unlined steel tanks are acceptable. For extended tank life & ease of cleaning coat interior with Carboline Plasite 7122, or 9133 over steel prepped per manufacturer's instructions.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:



Product Title: **SOS-C**

Material Type: Granular Liquid

Vendor name: EnviroTech Services Inc.

Active Ingredient: Calcium Chloride, Proprietary Performance Additive

Vendor suggested use: Pre-Treatment of Salt or Sand

Vendor suggested rate: Pre-Treatment of Salt: 4-10 gallons per ton. Pre-Treatment of Sand: 1-4 gallons per ton. NOTE: This number may vary depending on storage conditions. The salt application recommendations are higher due to the goal of increasing melting performance. If the main goal is to prevent freezing and maintain flow ability (as in the case with sand) lower application rates may be used.

Salt Brine Compatible: While SOS-C is compatible with salt brine, the product should not be used as such due to the physical properties precluding it from being used in direct pavement applications.

Mixing/Storage Guidelines: Applying to Salt or Sand: Apply using any salt or sand treating procedure. At lower temperatures, be aware of viscosity issues. Storage: A properly labeled “poly” or steel (preferably lined) tank. “Poly” Construction: Heavyweight, HDPE Resin such as Exxon Mobil HD8660 as used by Norwesco Tanks; which contains a UV inhibitor. Steel Construction: Unlined steel tanks are acceptable. For extended tank life & ease of cleaning coat interior with Carboline Plasite 7122, or 9133 over steel prepped per manufacturer's instructions.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:

Low BOD/COD, Product leaching is significantly reduced. Recommended stockpile application rates are 4 – 8 gallons / ton



Product Title: **SOS**

Material Type: Granular Liquid

Vendor name: EnviroTech Services Inc.

Active Ingredient: Magnesium Chloride, Proprietary Performance Additive

Vendor suggested use: Pre-Treatment of Salt or Sand

Vendor suggested rate: Pre-Treatment of Salt: 4-10 gallons per ton. Pre-Treatment of Sand: 1-4 gallons per ton. NOTE: This number may vary depending on storage conditions. The salt application recommendations are higher due to the goal of increasing melting performance. If the main goal is to prevent freezing and maintain flowability (as in the case with sand) lower application rates may be used.

Salt Brine Compatible: No, mixing with Salt Brine will lead to precipitation of NaCl from the brine.

Mixing/Storage Guidelines: Applying to Salt or Sand: Apply using any salt or sand treating procedure. At lower temperatures, be aware of viscosity issues. Storage: A properly labeled “poly” or steel (preferably lined) tank. “Poly” Construction: Heavyweight, HDPE Resin such as Exxon Mobil HD8660 as used by Norwesco Tanks; which contains a UV inhibitor. Steel Construction: Unlined steel tanks are acceptable. For extended tank life & ease of cleaning coat interior with Carboline Plasite 7122, or 9133 over steel prepped per manufacturer's instructions.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:

Low BOD/COD, Product leaching is significantly reduced. Recommended stockpile application rates are 4 – 8 gallons / ton



Product Title: **Meltdown APEX-C**

Material Type: Granular Liquid

Vendor name: EnviroTech Services Inc.

Active Ingredient: Calcium Chloride, Apex-C (Proprietary Corrosion Inhibitor)

Vendor suggested use: Deicing & Anti-icing. (WARNING: We do not recommend anti-icing until precipitation has started to occur. Studies have shown that anti-icing on dry surface may reduce friction.)

Vendor suggested rate: Anti-icing: 20 -30 gal/lane mil. WARNING: We do not recommend anti-icing until precipitation has started to occur. Studies have shown that anti-icing on dry surface may reduce friction. Deicing: 30-50 gal/lane mile. Application method: pencil streams NOT fan sprayers recommended for deicing. Fan sprayers do not provide sufficient pressure to penetrate ice and may experience clogging issues.

Salt Brine Compatible: Yes

Mixing/Storage Guidelines: A properly labeled “poly” or steel (preferably lined) tank. “Poly” Construction: Heavyweight, HDPE Resin such as Exxon Mobil HD8660 as used by Norwesco Tanks; which contains a UV inhibitor. Steel Construction: Unlined steel tanks are acceptable. For extended tank life & ease of cleaning coat interior with Carboline Plasite 7122, or 9133 over steel prepped per manufacturer's instructions.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:

MeltDown Apex-C is commonly used in anti-icing applications. MeltDown Apex-C can also be used to enhance the working temperature of common salt. Apex-C can be applied directly to the stockpile or used in pre-wetting applications. Recommended rates for short term stockpile treatments are 4 – 6 gallons / ton.



Product Title: **Meltdown APEX**

Material Type: Granular Liquid

Vendor name: EnviroTech Services Inc.

Active Ingredient: Magnesium Chloride, Shield AP (Proprietary Corrosion Inhibitor), Proprietary Performance Additive

Vendor suggested use: Deicing & Anti-icing. (WARNING: We do not recommend anti-icing until precipitation has started to occur. Studies have shown that anti-icing on dry surface may reduce friction.)

Vendor suggested rate: Anti-icing: 20 -30 gal/lane mile (1-2 gallons per 1000 square feet). WARNING: We do not recommend anti-icing until precipitation has started to occur. Studies have shown that anti-icing on dry surface may reduce friction. Deicing: 30-50 gal/lane mile (2-4 gallons per 1000 square feet). Application method: pencil streams NOT fan sprayers recommended for deicing. Fan sprayers do not provide sufficient pressure to penetrate ice and may experience clogging issues.

Salt Brine Compatible: No, mixing with Salt Brine will lead to precipitation of NaCl from the brine.

Mixing/Storage Guidelines: A properly labeled “poly” or steel (preferably lined) tank. “Poly” Construction: Heavyweight, HDPE Resin such as Exxon Mobil HD8660 as used by Norwesco Tanks; which contains a UV inhibitor. Steel Construction: Unlined steel tanks are acceptable. For extended tank life & ease of cleaning coat interior with Carboline Plasite 7122, or 9133 over steel prepped per manufacturer's instructions.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:

MeltDown Apex is commonly used in anti-icing applications. MeltDown Apex can also be used to enhance the working temperature of common salt. Apex can be applied directly to the stockpile or used in pre-wetting applications. Recommended rates for short term stockpile treatments are 4 – 6 gallons / ton.





Product Title:	Road Guard Plus 8
Material Type:	<input type="checkbox"/> Granular <input checked="" type="checkbox"/> Liquid
Vendor name:	Green Touch Systems LLC
Active Ingredient:	Corrosion Inhibited Calcium Chloride
Vendor suggested use:	Anti-icing, De-Icing, Stock Pile Treatment and Salt Brine Additive
Vendor suggested rate:	3-5 Gallons per ton of White Salt for Stock Pile Treatment. 8-10 Gallons per lane mile for Anti-Icing/Deicing and Blend with Salt Brine at a 80/20 mix—80% Salt Brine and 20% RG8
Salt Brine Compatible:	Yes
Mixing/Storage Guidelines:	Agitate Once per week during the season and once a month in off season
Lowest working temp:	Contact Vendor
Additional Vendor Supplied Information:	



Product Title:	TC Econo
Material Type:	<input type="checkbox"/> Granular <input checked="" type="checkbox"/> Liquid
Vendor name:	Green Touch Systems LLC
Active Ingredient:	Corrosion Inhibited Calcium Chloride and Sodium Chloride
Vendor suggested use:	Anti-Icing and Deicing
Vendor suggested rate:	10-12 Gallons per Lane Mile
Salt Brine Compatible:	No
Mixing/Storage Guidelines:	Agitate Once per week during the season and once per month in the off season
Lowest working temp:	Contact Vendor
Additional Vendor Supplied Information:	



Product Title: **Geomelt 55**

Material Type: Granular Liquid

Vendor name: SNI Solutions

Active Ingredient: Organic accelerator

Vendor suggested use: Geomelt 55 is PNS Qualified Product and MN DOT Approved, Geomelt 55 is 100% organic concentrate at 55% solids, no added chlorides, acetates, formates, glycols. Geomelt can be applied as is for salt stock pile treatment and/or pre-wet at spinner. Geomelt 55 can be blended with sodium chloride brine at 70% sodium chloride. 30% Geomelt 55 and applied as anti-icing or deicing agent.

Vendor suggested rate: Salt Stock pile treatment 4-5 gallons per ton, pre-wet at spinner 6-10 gallons per ton, anti-icing 20-30 gallons per lane mile, de-icing 50-60 gallons per lane mile.

Salt Brine Compatible: 100% compatible no special procedures or equipment necessary.

Mixing/Storage Guidelines: No mixing issues, circulate storage tank every other month during off season on preventive maintenance schedule.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:



Product Title: **Geomelt Gen 3**

Material Type: Granular Liquid

Vendor name: SNI Solutions

Active Ingredient: Organic Accelerators Geomelt, Biomelt, plus Potassium Acetate blended formulation.

Vendor suggested use: Geomelt Gen 3 is MN DOT Approved and was specifically engineered with input from MN DOT Research members to provide a Non Chloride product for application on Bridge Decks, high value infrastructure or environmentally sensitive areas. Geomelt Gen 3 can be applied as road salt stock pile treatment, pre-wet at spinner, anti-icing and deicing methods.

Vendor suggested rate: Geomelt Gen 3 can be applied to road salt stock pile treatment at 4-5 gallon per ton, pre-wet at spinner at 4-10 gallons per ton, anti-icing at 20-30 gallons per lane mile, deicing at 50-60 gallons per lane mile.

Salt Brine Compatible: 100% compatible, no special procedures or equipment.

Mixing/Storage Guidelines: No mixing issues, circulate storage tank every other month during off season on preventive maintenance schedule.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:



Product Title: **Headwaters® 10F Corrosion Inhibitor**

Material Type: Granular Liquid

Vendor name: Rivertop Renewables

Active Ingredient: Proprietary plant-derived, biodegradable chemicals.

Vendor suggested use: Reducing the corrosiveness of salt brine by 73%.

Vendor suggested rate: Anti-icing: Apply 20-50 gallons/LM of salt brine treated with inhibitor. Deicing: Inhibited brine can also be used for deicing at same rate as straight brine

Salt Brine Compatible: Yes, compatible with sodium chloride brine and sodium/calcium chloride blended brine.

Mixing/Storage Guidelines: At end of season, add remaining product into brine (at rate recommended above) to avoid microbial growth during the summer.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:

Corrosion inhibitors can drastically reduce the cost of corrosion. Inhibitors allow MnDOT to realize significant savings by avoiding repair and replacement of vehicles, snow fighting equipment and highway infrastructure that are subject to costly salt corrosion. Commercial, private and other public constituencies will share in those savings.



Product Title: **Headwaters® Corrosion Inhibitor**

Material Type: Granular Liquid

Vendor name: Rivertop Renewables

Active Ingredient: Proprietary plant-derived, biodegradable chemicals.

Vendor suggested use: Reducing the corrosiveness of salt brine by 75%.

Vendor suggested rate: Anti-icing: Apply 20-50 gallons/LM of salt brine treated with inhibitor. Deicing: Inhibited brine can also be used for deicing at same rate as straight brine

Salt Brine Compatible: Yes

Mixing/Storage Guidelines: At end of season, blend remaining product into brine (at rate recommended above) to avoid microbial growth during the summer.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:

Corrosion inhibitors can drastically reduce the cost of corrosion. Inhibitors allow MnDOT to realize significant savings by avoiding repair and replacement of vehicles, snow fighting equipment and highway infrastructure that are subject to costly salt corrosion. Commercial, private and other public constituencies will share in those savings.





Product Title: Ice Bite 55

Material Type: Granular Liquid

Vendor name: Univar

Active Ingredient: 55% Beet Juice

Vendor suggested use: Anti-icing- 20 gallons per lane mile /De-icing- 40 gallons pre lane mile depending on accumulation / Pre wetting- 4-6 gallons per tons of salt or sand

Vendor suggested rate: Pre-wet- 4-6 gallons/ton at the spinner or sander

Salt Brine Compatible: Yes

Mixing/Storage Guidelines: We advise the recirculation is done once a month to keep the product from settling.

Lowest working temp: Contact Vendor

Additional Vendor Supplied Information:

