

MNDOT
WINTER CHEMICAL CATALOG
OFFICE OF MAINTENANCE



February 2012





De-Icing Chemicals and the Environment

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 cause lakes to stratify; chloride contaminated water is denser than fresh water so it sinks. This dense layer of water at the bottom of the lake prevents mixing from occurring as it normally should. Lakes studied in the metro area were shown to mix only once per year or every other year. This reduction in mixing results 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, electrodialysis and distillation, are three processes that will reduce the chloride content of water. The standard set by the EPA for chlorides in surface water is 230 mg/L.



Magnesium Chloride, (MgCl₂)

Magnesium is a central element of chlorophyll in plants, essentially a nutrient. The Mg portion of this molecule is rarely the culprit when we observe “burnt” vegetation along roadsides or sidewalks. It is most likely the chloride that is causing the problem.

Calcium Chloride, (CaCl₂)

Calcium is also an essential nutrient for plants. The Ca portion of this molecule is also probably not the culprit in “burnt” vegetation. It is most likely the chloride that is causing the problem.

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. In very large quantities, these organic materials could produce an excessive amount of phosphorus in water which would allow algae and aquatic plants to grow in large quantities. When these algae and plants die bacteria decompose them which use up oxygen in the water causing a biological oxygen demand (BOD). The low oxygen levels in the water make it impossible for fish to breathe causing fish kills.

Acetates

See Organic Additives



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

North American Salt Co. (Compass Minerals)

Heidi White 801-732-3239 whiteh@compassminerals.com

- Arcticlear Gold
- Thawrox MG clear
- Thawrox MG plus

Envirotech Services

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

- LCS concentrate
- LCS 5000
- Ice Slicer
- Meltdown APEX
- S.O.S

SNI Solutions

Mike Bellovics 309-944-3168 mike@snisolutions.com

- Geomelt 55
- Geomelt S
- Geomelt Gen 3



Tiger Calcium Services (Green Touch Systems)

Bruce Zadach 651-414-6246 bzadach@chemstation.net

- Road Guard Plus 8
- TC Econo

Cargill

Phil Knapp 952-984-7415 phi_knap0p1@cargill.com

- Clearlane Enhanced De-icer

Cryotech De-icing

Tina Edger 319-372-6012 bid-receiving@cryotech.com

- CF7
- NAAC (pellets)

Scotwood Industries, Inc.

Mike Maphies 800-844-2022 mmaphies@scotwoodindustries.com

- Ice Ban 200
- FreezeGuard CI plus
- Alpine Ice Melt

Prairie Supply (Univar)

Chris Wehri 701-282-5656 chris.wehri@prairiesupply.com

- Ice Bite 55

For more information on the catalog contact:

Salt Solutions Coordinator 651-366-3586/651-592-4440

Kathy Schaefer 651-366-3575/612-418-6938 Kathleen.schaefer@state.mn.us



Alpine Ice Melt

Scotwood Industries

Lowest working temp:	Contact Vendor
Active Ingredient:	Potassium Acetate
Vendor suggested use:	Liquid De-icing/Anti-icing chemical
Vendor suggested rate:	3gal/per 100 sq. ft.
Suggested Rates: (MNDOT)	Same as Vendor
Salt Brine Compatible:	NA
Mixing Guidelines:	Do not mix with calcium chloride
Operator Feedback:	Provisional Approved/No field trials yet

Conclusions:

- Alpine Ice Melt can be used for anti-icing or de-icing operations
- Should be considered in chloride sensitive areas
- Works at low temperatures

Districts using product:

Material Safety Data Sheet:

\\ad\co\Public\MSDS\MSDS_Docs\Alpine Ice Melt.pdf



Arcticlear Gold

North American Salt

Lowest working temp

Contact Vendor

Active Ingredient:

Magnesium Chloride w/Molasses or Sugar beet product

Vendor suggested use:

De-icing, Anti-Icing Chemical/Salt Brine Additive

Vendor suggested rate:

Pre-wet-10+ gallons/ton

Anti-ice- 15-30 gallons/LM

Suggested Rates: (MNDOT)

Anti-Icing-15-30 gallons/LM for frost

Pre-wet-10+ gallons/LM

Salt Brine Compatible:

Yes

Mixing Guidelines:

- This product is designed to be mixed @ 20% Arcticlear Gold To 80% salt brine

Operator Feedback:

- Operators like it as a pre-wet agent when mixed in the sander or at the spinner
- Using it as a pre-wet helps keep the salt on the road better than dry salt alone
- The chemical mixes well with the salt brine and sticks to the salt very well
- The chemical is effective to prevent frost but the chemical did not work effectively as an anti-icing chemical for pre storm treatment

Conclusions:

- Arcticlear Gold works well as a salt brine additive
- Field results proved it's effective as an anti-icing agent for frost events
- Arcticlear Gold works as a pre-wet agent and sticks very well to the salt

District using product:

D1, D2, D6W

Material Safety Data Sheet:

file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/ArctiClear%20Gold.pdf



CF7

Cryotech De-icing Technologies

Lowest working temp:	Contact Vendor
Active Ingredient:	Potassium Acetate
Vendor suggested use:	Liquid De-icing chemical
Vendor suggested rate:	Pre-Wet 30 gallons/LM
Suggested Rates: (MNDOT)	Same as Vendor
Salt Brine Compatible:	Yes
Mixing Guidelines:	Do not mix with calcium chloride

Operator Feedback:

- Very effective for anti-icing on bridge decks when used in automated anti-icing systems.

Conclusions:

- CF 7 is used in bridge anti-icing units across the state
- Should be considered in chloride sensitive areas
- Works well at very low temperatures

Districts using product:

D4, Metro

Material Safety Data Sheet Link:

[file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/Cryotech%20CF7%20\(Liquid\)%20Potassium%20Acetate.pdf](file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/Cryotech%20CF7%20(Liquid)%20Potassium%20Acetate.pdf)



Clearlane Enhanced Deicer

Cargill

Lowest working temp:	Contact Vendor
Active Ingredient:	Magnesium Chloride treated salt
Vendor suggested use:	De-icing Chemical
Vendor suggested rate:	20-30% less than Regular rock salt
Suggested Rates: (MNDOT)	20-30% less than regular rock salt, as much snow as possible should be cleared mechanically (plowing) prior to using Clearlane
Salt Brine Compatible:	Yes
Mixing Guidelines:	This product is premixed at delivery

Operator Feedback:

- More Effective Deicer than straight salt in temperatures below 5 F
- Activates faster and returned road to bare lane faster than straight salt

Conclusions:

- Clearlane is an effective deicing chemical that can be used in colder temperatures
- Clearlane is treated with a corrosion inhibitor

Districts using product:

City of St. Paul, Scott County, City of Shakopee

Material Safety Data Sheet Link:

file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/ClearLane%20Enhanced%20Deicer.pdf

*See De-Icing Chemicals and the Environment sheet for chloride effects



FreezGard (liquid)

Scotwood Industries

Lowest working temp:	Contact Vendor
Active Ingredient:	Magnesium Chloride 28% w/corn based inhibitor
Vendor Suggested Use:	Stockpile treatment, anti-icing, or pre-wet
Vendor Suggested Rates:	<u>Anti-icing</u> 15-30 gal/LM <u>Stockpile treatment</u> - 6gal/Ton
Suggested Rates: (MNDOT)	<u>Anti-icing</u> - 15-30 gal/LM or as conditions would permit <u>Pre-wet</u> - 10 gallons/ton at the spinner or sander
Salt Brine Compatible:	No

Mixing Guidelines:

Operator Feedback:

- Effective as an anti-icing agent
- Sticks well to both salt and sand
- Makes the salt/sand sticky and sticks to the road better than dry salt

Conclusions:

- FreezGard is an effective anti-icing agent as well as an effective stockpile treatment and is very versatile
- Not recommended for stockpile treatments held over the summer
- Not recommended to mix with salt brine
- Can keep stockpiles free flowing in cold temps

Districts using product:

Metro, D3A

Material Safety Data Sheet Link:

file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/FreezGard%20CI%20Plus.pdf

*See De-Icing Chemicals and the Environment sheet for chloride effects



Geomelt 55

SNI Solutions

Lowest working temp:	Contact Vendor
Active Ingredient:	55% solids from Sugar Beets.
Vendor suggested Rate:	Depending on Application
Salt Brine Compatible:	Yes
MNDOT Suggested Use:	Anti-icing, Pre-wet, De-icer
Suggested Rates: (MNDOT):	<u>Stockpile Treatment</u> -5 to 6 gallons/ton <u>Pre-wet</u> - 10 gallons/ton <u>Anti-icing</u> - depend on Blend

Mixing Guidelines:

- Stockpile treatment higher than 6 gallons/ton, tends to have leaching problems

Operator Feedback:

- Geomelt 55 blended salt works better in colder temps than untreated salt
- Operators reported less salt consumption and a faster return to bare pavement

Conclusions:

- Geomelt can be used in a variety of ways including pre-wet, anti-icing and stockpile treatment.
- It can be mixed with any chloride
- Geomelt is 55% organic and has a “sticky” property to promote less scatter and bounce
- Organics have an ability to enhance the melting capacity of chlorides and carbohydrates help keep the ice from forming a bond to the highway

Districts using product:

D1, D3A

Material Safety Data Sheet:

<\\ad\co\Public\MSDS\MasterMSDS.html>

*See De-Icing Chemicals and the Environment sheet for chloride effects



Geomelt Gen3

SNI Solutions

Lowest working temp:	Contact Vendor
Active Ingredient:	Potassium Acetate/Agricultural bi-product
Vendor suggested use:	Liquid De-icing chemical
Vendor suggested rate:	<u>Prewet</u> -20-30 gal/ton <u>Anti-icing</u> -20-40 gal/Lane mile <u>De-icing</u> -50-70 gal/lane mile
Suggested Rates: (MNDOT)	Same as Vendor
Salt Brine Compatible:	NA
Mixing Guidelines:	Product is pre-mixed and is designed to be used alone
Operator Feedback:	New product No feedback yet

Conclusions:

- Geomelt Gen3 can be used in pre-wet, anti-icing, and de-icing operations
- Should be considered in chloride sensitive areas

Districts using product:

D1

Material Safety Data Sheet:

<\\ad\co\Public\MSDS\MasterMSDS.html>



Geomelt S

SNI Solutions

Lowest working temp:	Contact Vendor
Active Ingredient:	Organic solution 55% solids from Sugar Beets/with salt brine
Vendor suggested use:	Anti-icing, Pre-wet
Vendor suggested rate:	Depending on Application
Suggested Rates: (MNDOT)	<u>Pre-wet-</u> 10 gallons/ton <u>Anti-icing-</u> 15-30 gallons/lm
Salt Brine Compatible:	yes

Mixing Guidelines:

- Geomelt S can be used as a Pre-wet

Operator Feedback:

- There is no operator feedback at this time, MNDOT is not currently using this product

Conclusions:

- Geomelt S can be used in a variety of ways including pre-wet and anti-icing
- It can be mixed with any other chloride
- Geomelt S is a 55% organic product and has a “sticky” property to promote less scatter and bounce when used as pre-wet
- Organics have an ability to enhance the melting capacity of chlorides and carbohydrates help keep the ice from forming a bond to the highway

Districts using product:

Material Safety Data Sheet:

[file:///ad/co/Public/MSDS/MSDS_Docs/GEOMELT®%2055%20anti-icing-deicing%20fluid.pdf](file:///ad/co/Public/MSDS/MSDS_Docs/GEOMELT%2055%20anti-icing-deicing%20fluid.pdf)

*See De-Icing Chemicals and the Environment sheet for chloride effects



Ice Slicer

Envirotech Services

Lowest working temp:	Contact Vendor
Active Ingredient:	Naturally occurring complex chlorides (granular)
Vendor suggested use:	De-icing chemical
Vendor suggested rate:	30-50% less than Regular salt
Suggested Rates: (MNDOT)	Same as Vendor
Salt Brine Compatible:	Yes
Mixing Guidelines:	This is a granular product
Operator Feedback:	<ul style="list-style-type: none">• Activated faster than straight salt• Faster return time to bare lane than straight salt• May leave a small residue on road that can raise concerns with the public

Conclusions:

- Less corrosive than regular salt
- Ice Slicer is less invasive than regular salt to vegetation and the environment
- Activates faster than straight salt

Districts using product:

D2

Material Safety Data Sheet:

\\ad\co\Public\MSDS\MSDS_Docs\Ice Slicer RS.pdf

*See De-Icing Chemicals and the Environment sheet for chloride effects



Ice Ban 200 M (liquid)

Scotwood Industries

Lowest working temp:	Contact Vendor
Active Ingredients:	28% Magnesium Chloride and a corn based organic Modifier
Vendor suggested use:	Stockpile treatment, anti-icing, or pre-wet
Vendor suggested rates:	<u>Anti-icing</u> - 15-30 gal/LM <u>Stockpile treatment</u> - 6gal/Ton (20-30% reduction in rates)
Suggested Rates: (MNDOT)	<u>Stockpile treatment</u> - 6 gal/ton <u>Pre-wet</u> - 10 gallons/ton at the spinner <u>Anti-icing</u> - 15-30 gal/LM or as conditions would permit.
Salt Brine Compatible:	NO

Mixing Guidelines:

- Do not mix with salt brine
- Stockpile treatment 6/gallons ton

Operator Feedback:

- Did not work any better than sodium chloride at temps colder than 15 F, either in anti-icing or de-icing
- Stockpile treatment has had little or no leaching problems (6gal/ton) during the winter season
- If held over summer leaching may occur in some cases
- Need to keep dry otherwise it tends to clump and freeze

Conclusions:

- Mixing with salt brine can cause crystallization in the tank and create problems
- Keeps stockpiles free flowing and ready to apply in temps near zero
- Not recommended as a cost effective alternative chemical

Districts using product:

D6E, D1, D3

Material Safety Data Sheet Link:

file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/Ice%20Ban%20200%20Concentrate.pdf

*See De-Icing Chemicals and the Environment sheet for chloride effects



Liquid Corn Salt (LCS 5000)

Envirotech Services

Lowest working temp:	Contact Vendor
Active Ingredient:	Carbohydrate from corn and Salt brine mix
Vendor suggested use:	Salt Brine Additive
Vendor suggested rate:	<u>Anti-icing</u> -15-20 gallons/LM
Suggested Rates: (MNDOT)	<u>Pre-wet</u> -90-10% Mix <u>Anti-icing</u> - 90-10% mix
Salt Brine Compatible:	Yes

Mixing Guidelines:

- LCS 5000 is 50% salt brine and 50% LCS mix needing to be diluted
- Mix at 90% salt brine and 10% LCS

Operator Feedback:

- Performs good as an anti-icing chemical for residual effect
- When used as a pre-wet, it helps salt stick to the road
- Melts at a slightly lower temp than regular salt brine

Conclusions:

- LCS 5000 is not intended to be used as is, it is designed to be diluted
- Operators use LCS as an effective pre-wet and anti-icing chemical
- Mixture concentration will be determined by need and storage availability
- Once LCS is mixed it requires little or no agitation in storage tanks

Material Safety Data Sheet Link:

[file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/Liquid%20Corn%20Salt%20\(LCS\)%205000.pdf](file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/Liquid%20Corn%20Salt%20(LCS)%205000.pdf)

*See De-Icing Chemicals and the Environment sheet for chloride effects



Liquid Corn Salt (LCS Concentrate)

Envirotech Services

Lowest working temp:	Contact Vendor
Vendor suggested use:	Salt Brine Additive
Vendor suggested rate:	LCS Concentrate needs to be mixed with salt brine 50-50 at delivery <u>Anti-icing</u> - 15-20 gallon/LM
Suggested Rates: (MNDOT)	LCS should be used in a 90-10 mix <u>Pre-wet</u> - 90-10% mix
Salt Brine Compatible:	Yes

Mixing Guidelines:

- LCS Concentrate needs to be diluted with 50% salt brine at delivery
- Final product should be 90% salt brine and 10%LCS

Operator Feedback:

- Good performance as an anti-icing chemical for residual effect
- When used as a pre-wet, it helps salt stick to the road
- Melts at a slightly lower temp than regular salt brine
- Some areas have used LCS as a stockpile treatment although it is not recommended by the vendor

Conclusions:

- LCS Concentrate is not intended to be used as is, it needs to be blended
- Product needs to be diluted at delivery or it will set up in the tank
- Operators use LCS as an effective pre-wet and anti-icing chemical
- Mixture concentration will be determined by need and storage availability
- Once LCS is mixed it requires little or no agitation in storage tanks

Districts using product:

Metro, D1

Material Safety Data Sheet Link:

[file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/Liquid%20Corn%20Salt%20\(LCS\)%205000.pdf](file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/Liquid%20Corn%20Salt%20(LCS)%205000.pdf)

*See De-Icing Chemicals and the Environment sheet for chloride effects



Meltdown Apex (liquid) Envirotech Services

Lowest working temp:	Contact Vendor
Active Ingredient:	Magnesium Chloride 28% w/corn based inhibitor
Vendor suggested use:	De-Icing, anti-Icing, or pre-wet
Vendor suggested rates:	<u>Anti-icing</u> - 15-30 gal/LM
Suggested Rates: (MNDOT)	<u>Anti-icing</u> - 15-30 gal/LM or as conditions would permit <u>Pre-wet</u> - 10 gallons/ton at spinner/sander
Salt Brine Compatible:	No
Mixing Guidelines:	Not to be mixed with salt brine
Operator Feedback:	<ul style="list-style-type: none">• Works well to limit ice and frost on bridge decks and roadways when used when anti-icing in extreme temperatures
Conclusions:	<ul style="list-style-type: none">• Meltdown Apex is an effective anti-icing agent with little refreeze in cold temperatures• Not recommended for stockpile treatments• Not recommended to mix with salt brine
Districts using product:	D3A, Metro

Material Safety Data Sheet Link:

file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/Meltdown%20Apex.pdf

*See De-Icing Chemicals and the Environment sheet for chloride effects



NAAC (Pellets)

Cryotech De-icing Technologies

Lowest working temp:	Contact Vendor
Active Ingredient:	Sodium Acetate
Vendor suggested use:	Solid De-icing chemical
Vendor suggested rate:	Depending on conditions of snow pack
Suggested Rates: (MNDOT)	Same as Vendor
Salt Brine Compatible:	NA
Mixing Guidelines:	Do not mix with calcium chloride

Operator Feedback:

- MNDOT is not currently using this product
- Airports have used this product to limit corrosion

Conclusions:

- NAAC can be used for anti-icing just as an event starts
- Should be considered in chloride sensitive areas
- Works at low temperatures

Districts using product:

Airports

Material Safety Data Sheet:

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Road Guard Plus-8

Tiger Calcium

Lowest Working Temp:	Contact Vendor
Active Ingredients:	26.5% Calcium Chloride, 8% Corrosion Inhibitor (Beet Juice or Molasses)
Vendor's Suggested Use:	Anti-icing, Pre-wet, stockpile Treatment
Vendor's Suggested Rate:	Depending on Application
MNDOT's Suggested Rates:	<u>Anti-icing</u> -depends on blend <u>Pre-wet</u> -10gallons/ton <u>Stockpile treatment</u> -5-8 gallons/ton
Salt Brine Compatible:	Yes

Mixing Guidelines:

- RG8 can be used as a pre-wet and during anti-icing operations in a variety on concentrations
- RG8 can also be used as a stock pile treatment in a range from 3-8 gallons a ton (keep in mind the higher gal/ton the more likely leaching will occur)

Operator Feedback:

- RG8 can be used as a pre-wet with concentrations ranging from 90-10% to undiluted
- Pretreating stockpiles has been very effective, this keeps piles free flowing in cold temps and throughout the summer months
- Treated salt stays on the road better, starts working faster, and has a longer effectiveness
- Anti -icing with RG8 is also effective when used in a straight concentration or mixed with salt brine (effectiveness will be determined by the concentration)
- RG8 leaves a residue on the road and can pull moisture out of the air and can cause the road to glaze.
- If Mixed more than 20% with salt brine and left for long periods of time it may settle out

Conclusions:

- RG8 is a very effective enhancement to anti-icing or deicing operations
- It can also be used as a stockpile treatment
- It is very versatile which makes it a popular chemical for many situations

Districts using product:

D1, D2, D6W, Metro

Material Safety Data Sheet Link:

<\\ad\co\Public\MSDS\MSDS Docs\Snow and Ice\Road Guard Plus-8.pdf>



S.O.S

Envirotech Services

Lowest working temp:	Contact Vendor
Active Ingredient:	Magnesium chloride
Vendor suggested use:	Pre-treated Salt
Vendor suggested rate:	<u>Stockpile</u> -6 gallons/ton
Suggested Rates: (MNDOT)	Same as Vendor
Salt Brine Compatible:	No
Mixing Guidelines:	Stockpile Treatment

Operator Feedback:

- Becomes thick in cold temperatures, very hard to pump while loading and while blending
- It did not perform better than straight salt on getting the roads to bare lane
- Plugs filters on blender and brine makers
- Keeps salt piles free flowing
- Do not mix with salt brine, will settle out and leaves a sludge in tank

Conclusions:

- S.O.S is a new stockpile treatment chemical
- Sticks will to salt to limit bounce and scatter effect
- Reduce salt use by 30%

Districts using product:

D2, D4, Metro

Material Safety Data Sheet:

\\ad\co\Public\MSDS\MSDS_Docs\S O S Treated Salt Agent.pdf



TC Econo

Tiger Calcium Services (Green Touch Systems)

Lowest working temp:	Contact Vendor
Active Ingredient:	Calcium and magnesium chloride w/salt brine
Vendor suggested use:	Liquid de-icing chemical
Vendor suggested rate:	Same as current rates
Suggested Rates: (MNDOT)	Same as Vendor
Salt Brine Compatible:	Yes
Mixing Guidelines:	This product is premixed at delivery
Operator Feedback:	MnDOT is not using this product currently

Conclusions:

- TC Econo is designed to be used as a salt brine
- It can be used in place of current brine or in colder situations

Districts using product:

Material Safety Data Sheet Link:

file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/TC%20Econo.pdf

*See De-Icing Chemicals and the Environment sheet for chloride effects



Thawrox MG Clear (Additive)

North American Salt Co

Lowest working temp:	Contact Vendor
Active ingredient:	26% Magnesium chloride with corrosion inhibitor
Vendor suggested use:	De-icing Chemical (stockpile treatment)
Vendor suggested rate:	20-30% less than non-treated salt
Suggested Rates: (MNDOT):	<u>Stockpile</u> -5 gallons/ton
Salt Brine Compatible:	NA

Mixing Guidelines:

- This product is a pretreated salt used primarily in cold weather situations
- It can be used in warmer temps at a reduced rate
- This product can be purchased as a liquid or premixed w/salt from the vendor

Operator Feedback:

- Thawrox can be used in very cold temps without a pre-wet solution
- Thawrox holds the road better than white salt and keeps road wet longer in most cases
- Has been mixed with sand in some cases
- Keeps piles free flowing
- Has a high tendency to leach out of stockpiles

Conclusions:

- Thawrox can be effective down to 0 degrees
- This product also stays workable in cold weather
- Can be purchased pre-mixed, or in liquid form
- Can be dyed to whatever color preferred when mixing

Districts using product:

D1, D3A, D7, D8, Metro

Material Safety Data Sheet Link:

file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/Thawrox%20Mg%20Plus%20&%20Mg%20Clear.pdf

*See De-Icing Chemicals and the Environment sheet for chloride effects



Thawrox MG Plus (Additive)

North American Salt Co

Lowest working temp	Contact Vendor
Active ingredient:	26% Magnesium chloride with a molasses based corrosion inhibitor
Suggested Rate: (Vendor)	20-30% less than non-treated salt
Salt Brine Compatible:	NA
Suggested Use: (Vendor)	De-icing Chemical (stockpile treatment)
Suggested Rates: (MNDOT)	<u>Stockpile</u> - 5gallons/ton

Mixing Guidelines:

- This product is a pretreated salt used primarily in cold weather situations
- It can be used in warmer temps at a reduced rate
- This product can be purchased as a liquid or premixed w/salt from the vendor

Operator Feedback:

- Thawrox can be used in very cold temps without a pre-wet solution
- Thawrox holds to the road better than white salt and keeps the road wet longer in most cases
- Has been mixed with sand with good results in some cases
- Has a high tendency to leach out of stockpiles
- Keeps piles free flowing

Conclusions:

- Thawrox can be effective down to 0 degrees
- This product also stays workable in cold weather
- Can be purchased pre-mixed, or in Liquid form

Districts using product:

D3A, Metro

Material Safety Data Sheet Link

file:///ad/co/Public/MSDS/MSDS_Docs/Snow%20and%20Ice/Thawrox%20Mg%20Plus%20&%20Mg%20Clear.pdf

*See De-Icing Chemicals and the Environment sheet for chloride effects



Ice Bite 55

SNI Industries

Lowest working temp:	Contact Vendor
Active Ingredient:	55% Beet juice
Vendor Suggested Use:	Anti-Icing, De-icing, Pre-wet
Vendor Suggested Rates:	<u>Anti-icing</u> - 20 gallons per lane mile <u>De-icing</u> - 40 gallons pre lane mile depending on accumulation <u>Pre wetting</u> - 4-6 gallons per tons of salt or sand
Suggested Rates: (MNDOT)	<u>Pre-wet</u> - 4-6 gallons/ton at the spinner or sander

Salt Brine Compatible: Yes

Mixing Guidelines:

Operator Feedback:

- New product, no feedback at this time

Conclusions:

Districts using product:

Material Safety Data Sheet Link:

\\ad\co\Public\MSDS\MSDS_Docs\Ice Bite 55.pdf

*See De-Icing Chemicals and the Environment sheet for chloride effects