BEET HEET®

THE RED HOT GREEN DEICER

Brought to you by

K-TECH
SPECIALTY COATINGS, INC.

A Klink Group Company www.klinkgroup.com and sole developer, manufacturer and distributor of BEET HEET®, the best performing deicer in North America.

BEET HEET®

users have won the national APWA *Excellence in Snow & Ice Control Award* 7 times in the last 10 years!

PACIFIC NORTHWEST SNOWFIGHTERS

BEET HEET® Concentrate Is 99% Biodegradable

"Readily" Biodegradable in 8 days!

CLEAR ROADS
research for winter highway maintenance

Qualified Products List

In our pursuit of EXCELLENCE we want to thank

Pacific Northwest Snowfighters

ANALYTICAL LABORATORIES, INC.

Fibertec environmental services

SiTU Biosciences, LLC

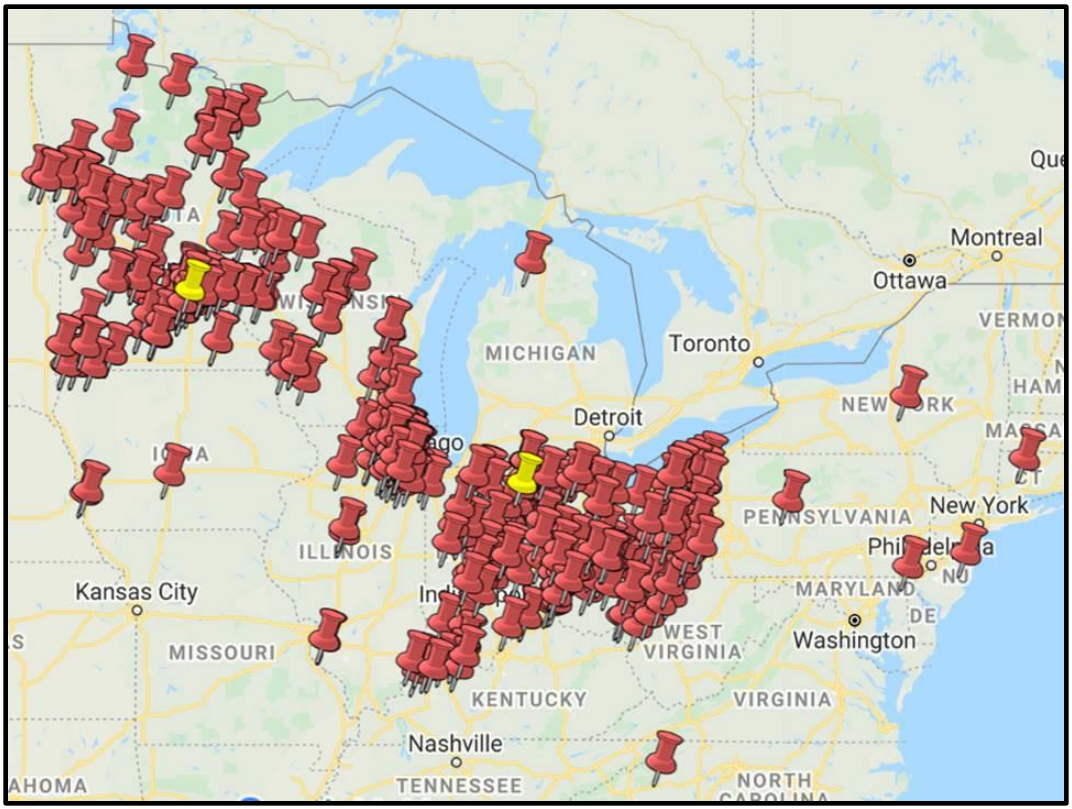
Forensic Dynamics, Inc.

ADVANCED LABORATORIES®

RespirTek™ CONSULTING LABORATORY

BEET HEET®

THE RED HOT GREEN DEICER



Hundreds of agencies in 14 states have transitioned away from 32% $CaCl_2$, "beet juice" and various "super-mix" deicers in favor of BEET HEET. In fact, BEET HEET users have won the National APWA *Excellence In Snow & Ice Control Award* 7 times in the last 10 years! What do all of these agencies see in BEET HEET? Please read on.

WHAT IS BEET HEET®

Far Superior Ice Melting Performance

High Sugar Content - Far Superior Residual & Anti-bonding

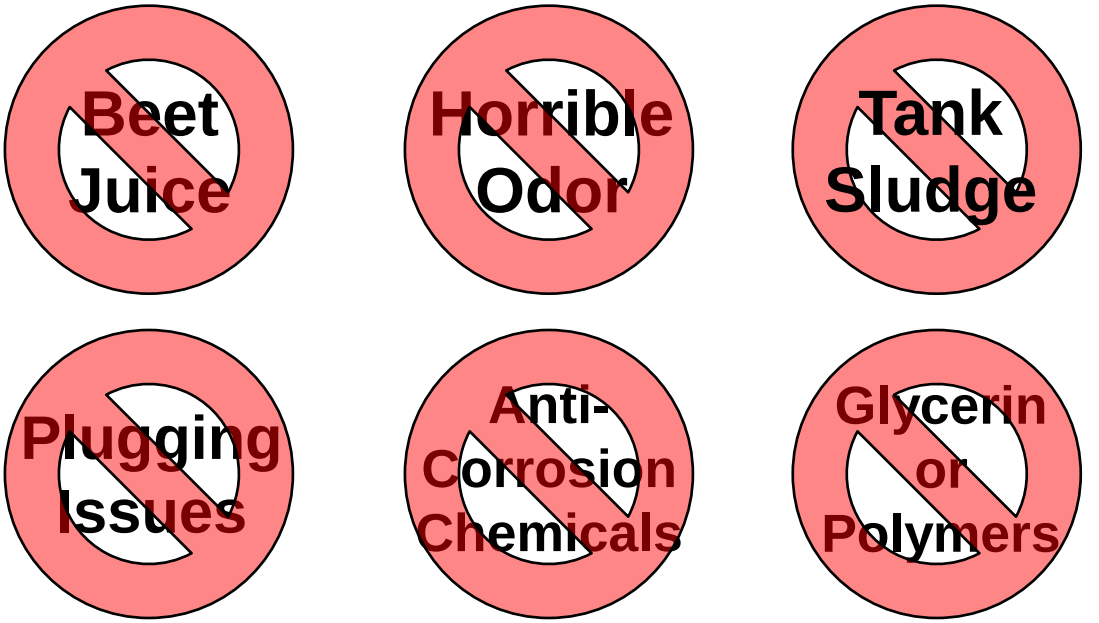
4 CHLORIDES

- Calcium Chloride
- Magnesium Chloride
- Sodium Chloride
- Potassium Chloride

4 CARBOHYDRATES

- Sucrose Sugar
- Glucose Sugar
- Fructose Sugar
- Raffinose Sugar

What BEET HEET® is NOT



BEET HEET®

The Importance of Sugar

BEET HEET® Concentrate (BHC) contains significantly more sugar than any organic/chloride deicer in North America. When it comes to enhancing the deicing and anti-icing performance of rock salt and sodium chloride brine, the benefits of adding sugar are far reaching and significantly more important than many snowfighters realize. Here are several performance enhancing benefits that the sugars in BHC provide when BHC is added to rock salt and brine in meaningful levels.

1. **The sugars in BHC suppress the freeze point of rock salt and brine.**
2. **The sugars in BHC lower the effective working temperature of rock salt and brine.**
3. **The sugars in BHC increase the ice melt capacity of rock salt and brine.**
4. **The sugars in BHC significantly reduce the corrosion value of rock salt and brine.**
5. **The sugars in BHC act as cryoprotectants. Cryoprotectants slow down the rate at which melted snow and ice refreeze. This is a huge benefit because most roadway surfaces deicers are applied to are crowned. Slowing down the rate of refreeze allows much more melted snow and ice to run off the road surface before it refreezes.**
6. **Cryoprotectants also inhibit the formation of ice crystals. Deicers and anti-icers containing sugar at meaningful levels are significantly more effective at preventing frost and ice formations.**
7. **The sugars in BHC significantly strengthen and extend the anti-bonding characteristics of rock salt and NaCl brine. This is huge considering the costs of chiseling and melting off bonded precipitation verses the costs of pealing off un-bonded precipitation.**
8. **The sugars in BHC significantly strengthen and extend the residual effect of rock salt and NaCl brine. In fact, just the leftover residue from BHC treated rock salt acts as an effective anti-icer at the next snow event.**
9. **The sugars in BHC act as a tackifier. Pre-wetting rock salt with a heavy, sticky tackifier reduces bounce and scatter loss far more than pre-wetting agents containing little to no sugar. When it comes to anti-icing, the longer an anti-icer is held in the target area, the more ice it will melt in the target area. Anti-icers with little to no sugar quickly dilute out and are washed away, or they dry up and blow away.**
10. **The dark sugars in BHC darken rock salt and brine which increases their ability to absorb heat in the form of solar radiation. If they absorb heat, they're also emitting heat, which significantly improves their ice melting capacity. Even on cloudy days about 50% of the sun's radiation reaches the earth's surface. Clear deicers like 32% $CaCl_2$, 23.3% NaCl brine and deicers containing corn syrup do not have this transforming ability.**

BEET HEET®

beet juice vs. BEET HEET®

DE-SUGARED 55% Solids Beet Juice

- **Consistency - Very Inconsistent (Easily verified by laboratory testing)**
- **Total Sugar Content 18.3% (Average)**
- **Total Chloride Content 0.6% (Average)**
- **Total Active Ingredient Content <18.9% (Average) (48% less vs. BHC)**
- **Price Per each 1% of Active Ingredient = $0.09 (125% higher vs. BHC)**
- **Breathtaking Odor.**
- **Prone to Bacterial Growth (Sugar eating bacteria reduces sugar content)**
- **Plugging Issues (Tank sludge and plugging issues widely reported)**
- **Promoted as "non-chloride" deicer but can't melt ice without adding chloride! Once activated with chloride, beet juice is a chloride deicer.**
- **At 5 gal. per ton, beet juice treated salt melts about 22.4% less ice than BHC at 25°F.**

BEET HEET® Concentrate (BHC)

- **Absolutely NO "beet juice" added**
- **Contains processed beet molasses. (No sludge or plugging issues)**
- **Consistency - Very Consistent (molasses is not a waste-stream product)**
- **Total Sugar Content >15.1%**
- **Total Chloride Content >21.4% (Over 35 times more vs. beet juice)**
- **Total Active Ingredient Content >36.5% (93% more vs. beet juice)**
- **Price Per 1% of Active Ingredient = $0.04 (55% lower vs. beet juice)**
- **Odor – Coffee, Syrup or Chocolate (sweet compared to beet juice)**
- **Bacteria can't survive in BHC (no loss of sugar either)**
- **No Plugging or Tank Slugging Issues (none reported)**
- **Stand Alone Ice Melter (no time and effort of mixing with chloride required)**
- **At 5 gal. per ton, BHC treated salt melts about 28.8% more ice than beet juice at 25°F.**

Conclusion

Beet juice costs 125% more than BH when considering price per each 1% of active ingredient! Because beet juice contains 48% less active ingredient than BHC, beet juice treated salt melts about 22.4% less ice than BH treated salt at 25°F. Therefore, beet juice users must use about 28.8% more salt to melt the same amount of ice as BHC treated salt. This means that beet juice users are discharging much more chloride into their local environment than necessary.

They're also spending much more on rock salt than necessary. Transitioning to BHC would allow current beet juice users to reduce their salt application rates by about 22.4% and still melt the same amount of ice as beet juice treated salt. Transitioning to BH would also decrease beet juice user's chloride emissions and salt costs by about 22.4%.

BEET HEET®

beet juice vs. BEET HEET®

Category	BEET HEET Concentrate	55% Solids Beet Juice
Appearance	Dark Brown	Dark Brown
Odor	Coffee - Syrup	Offensive
Specific Gravity	1.31 +/- 0.015	1.27 +/- .02
Freeze Point	-23.8°F	-22.5°F*
Weight/Gallon lbs.	10.75 +/- .10	10.5 +/- .20
Solids Content by weight	51%	55%
Ingredient Consistency	Very Consistent	Very Inconsistent
Non-Exothermic (NaCl, KCl) Chloride Content by weight	6.4%	0.6%*
Exothermic (CaCl2) (MgCl2) Chloride Content by weight	15.0%	0.0%*
Sugar Content by weight	15.1%	18.3%*
Total Active Ingredient Content by wt.	36.5%	18.9%* (48% less)
Fallout	No	Yes
Plugging	No	Yes
Bacterial Growth	No	Yes
Tank Sludge	No	Yes
Requires added chloride to melt ice	No	Yes
Ice Melt Performance @ 25°F (Treated salt @ 5 gal/ton)	28% more	22% less
Ice Melt Performance @ 15°F (Treated salt @ 5 gal/ton)	38% more	27% less
Chloride Emissions @ 25°F (Treated salt @ 5 gal/ton)	22% less †	28% more †
Chloride Emissions @ 15°F (Treated salt @ 5 gal/ton)	27% less †	38% more †
Average Delivered Cost Per Gallon (225 mi from K-Tech)	$1.43	$1.70 (18% higher)
Average Delivered Cost Per Each 1% of Active Ingredient	$0.04	$0.09 (125% higher)
Average Delivery Time	24 to 48 hours	3 to 5 days
* Averaged count due to product inconsistancy		
† Based on the amount of treated rock salt required to melt the same amount of ice.		

This Is Simple Logic

More Active Ingredient = Better Performance
Better Performance = Greater Public Safety
Better Performance = Lower Chloride Emissions

32% $CaCl_2$ vs. BEET HEET®

32% Calcium Chloride ($CaCl_2$)

- **Total Sugar Content 0.0%**
- **Total Chloride Content 32.0%**
- **Total Active Ingredient Content 32% (12.3% less vs. BH)**
- **PNS Corrosion Value = 121 (717.5% more corrosive than BH)**
- **At 7 gal/ton, 32% $CaCl_2$ treated salt melts about 27.5% less ice than BH at 25°F.**
- **32% $CaCl_2$ cannot darken rock salt or brine like BH does! The darker rock salt and brine are, the more solar radiation (heat) they absorb. If they are absorbing heat, they are emitting heat as well.**

BEET HEET® Concentrate (BHC)

- **Total Sugar Content >15.1%**
- **Total Chloride Content >21.4%**
- **Total Active Ingredient Content >36.5% (14.0% more vs. 32% $CaCl_2$)**
- **PNS Corrosion Value = 14.8 (87.7% less corrosive than 32% $CaCl_2$)**
- **At 5 gal. per ton, BHC treated salt melts about 38.1% more ice than 32% $CaCl_2$ treated salt at 25°F.**
- **BH darkens rock salt and brine, transforming them into solar radiation absorbers and heat emitters. At 27°F, BHC treated rock salt can be as much as 5°F warmer than white rock salt. A 50/50 blend of BHC and 23.3% NaCl brine can be as much as 10°F warmer than a clear chloride solution.**

Conclusion

Because 32% $CaCl_2$ contains 12.3% less active ingredient than BHC and does not contain any sugar, 32% $CaCl_2$ treated salt melts about 27.5% less ice than BHC treated salt at 25°F. Therefore, 32% $CaCl_2$ users must use about 38.1% more salt to melt the same amount of ice as BHC treated salt. This means that 32% $CaCl_2$ users are discharging about 38.1% more chloride into their local environment than necessary. They're also spending about 38.1% more on rock salt than necessary.

Transitioning to BHC would allow current 32% $CaCl_2$ users to reduce their salt application rates by about 27.5% and still melt the same amount of ice as 32% $CaCl_2$ treated salt. They would also be reducing their chloride emissions and rock salt costs by about 27.5%.

Because 32% $CaCl_2$ does not contain dark sugar like BHC, (See page 4 of this booklet) it has no ability to transform rock salt or brine into radiation absorbers and heat emitters. This, along with a 27.5% lower ice melt capacity makes it impossible for 32% $CaCl_2$ to outperform BHC in the laboratory or in the field. Couple these performance shortcomings with the fact that 32% $CaCl_2$ is over 700% more corrosive than BHC, it's very difficult to justify the use of 32% $CaCl_2$ over BHC.

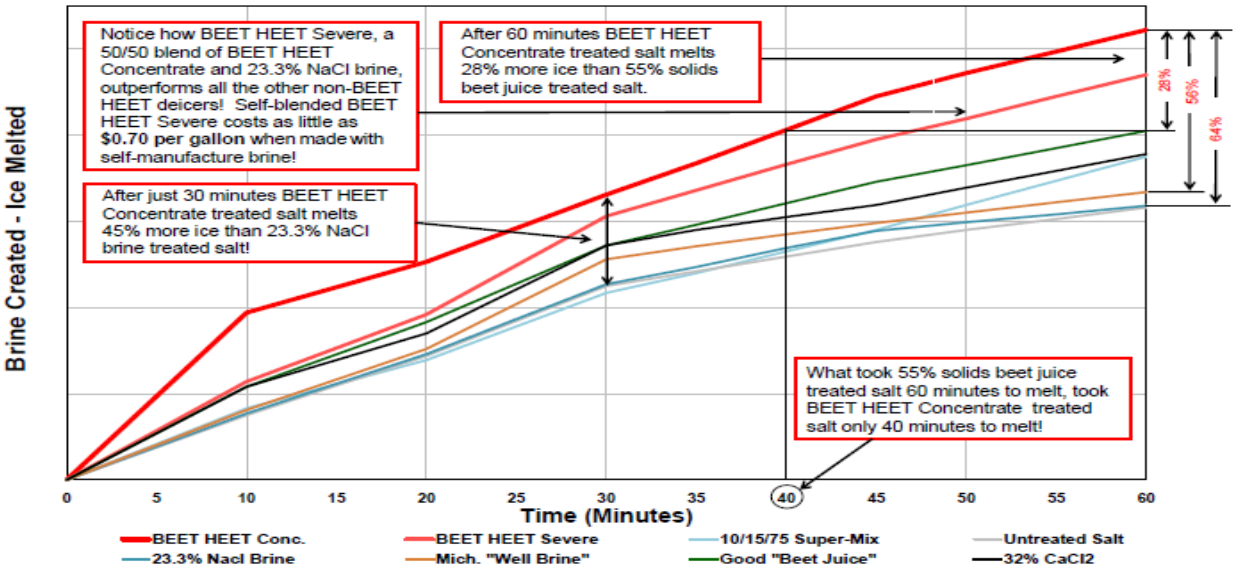
BEET HEET®

PERFORMANCE

Treated Salt Ice Melt Capacity Test Results @ 25°F

Modified SHRP 205.1 Ice Melt Capacity Solids

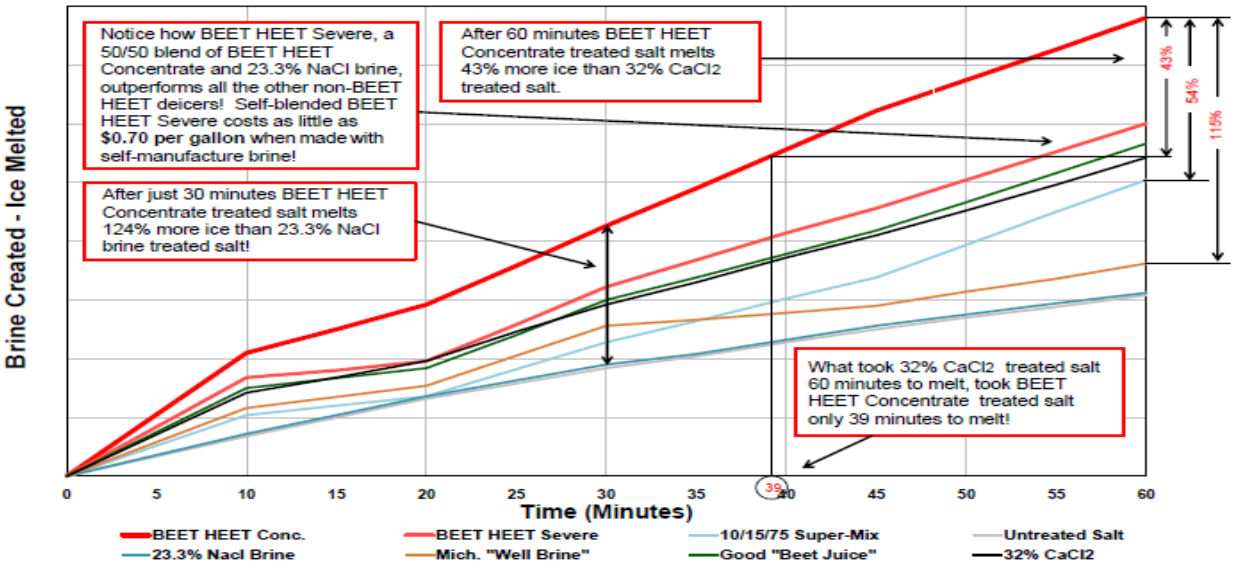
Advanced Laboratories, Inc. Salt Lake City, UT - Margin of Error 3.6%



Treated Salt Ice Melt Capacity Test Results @ 15°F

Modified SHRP 205.1 Ice Melt Capacity Solids

Advanced Laboratories, Inc. Salt Lake City, UT - Margin of Error 3.6%



BEET HEET®

PERFORMANCE

SALT STOCKPILE TREATMENT

BEET HEET® Concentrate (BHC)

- Evenly apply to salt at 5 gallons per ton and turn until uniformly coated and colored.
- Rock salt must have a moisture content of less than 1.5%
- If the salt's moisture content is greater than 1.5%, apply at 4 gallons per ton

Benefits at 5 gal/ton

- Melts up to 65.1% more ice than untreated rock salt at 5 gal. per ton at 25°F*****
- Melts up to 153.2% more ice than untreated rock salt at 5 gal. per ton at 15°F*****
- Melts up to 38.1% more ice than 32% $CaCl_2$ treated salt at 5 gal. per ton at 25°F*****
- Reduce salt application rates 28% at 25°F if transitioning from "beet juice" pre-wet.
- Reduce salt application rates 27% at 25°F if transitioning from 32% $CaCl_2$ pre-wet.
- Reduce salt application rates 39% at 25°F if transitioning from untreated rock salt.
- Low effective working surface temperature, Lower than -12.5°F

SALT PRE-WETTING

BEET HEET® Blends

- BHC can be used as a pre-wet at 100%, but we recommend cutting BHC with 23.3% NaCl brine 50% to 75%.
- Apply at 5 to 20 gallons per ton depending on blend ratio and incoming weather.

Benefits

- Melts up to 65% more ice than untreated rock salt at 25°F*****
- Melts up to 153% more ice than untreated rock salt at 15°F*****
- Melts up to 38% more ice than 32% $CaCl_2$ treated salt at 25°F*****
- Reduce salt application rates up to 28% at 25°F if transitioning from beet juice pre-wet
- Reduce salt application rates up to 39% at 25°F if transitioning from untreated rock salt
- Low effective working surface temperature, -22.5°F

DIRECT APPLICATION ANTI-ICING & DEICING

- Apply at 20 to 57.5 gallons per l/m depending on BHC/NaCl blend and temperature.

Benefits

- Melts up to 26% more ice than 23.3% NaCl brine at 20°F*****
- Melts up to 19% more ice than a 10/15/75 "super-mix" anti-icer at 20°F*****
- Melts up to 16% more ice than a S30/70 "beet juice" anti-icer at 20°F*****
- Far superior anti-bonding properties allowing much easier snow and ice removal
- Superior residual properties reducing the number of applications per event and season
- Low effective working surface temperature, -12.5°F to -17.5°F

*** Advanced Laboratories, Inc. Salt Lake City, Utah**

BEET HEET®

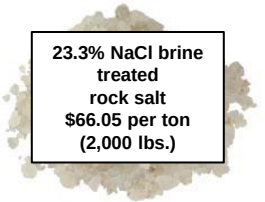
Brine treated rock salt is nearly 50% more costly to use than BEET HEET® treated salt!

23.3% NaCl Brine vs. BEET HEET® Concentrate BHC

+

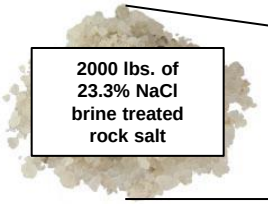
85% LESS costly

=



8.6% LESS costly

64% MORE salt



49.9% MORE costly

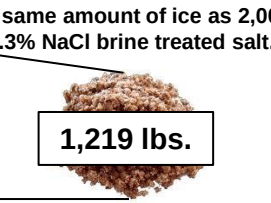
+

590% MORE costly

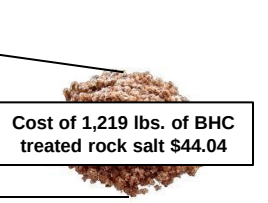
=

9.4% MORE costly

Amount of BHC treated rock salt required to melt the same amount of ice as 2,000 lbs. of 23.3% NaCl brine treated salt.



39% LESS salt



33.3% LESS costly

BEET HEET®

Untreated rock salt is nearly 50% more costly to use than BEET HEET® treated salt!

Untreated rock salt is far and away the most expensive salt any agency could possibly use! When the cost of using untreated rock salt is compared to the cost of using BEET HEET® Concentrate (BHC) treated salt, untreated rock salt is nearly 50% more expensive to use than BHC treated salt! Similarly, 23.3% NaCl brine treated salt is also nearly 50% more costly to use than using BHC treated salt!

This is the primary reason advanced agencies treat 100% of their rock salt with BHC, no matter what the temperature is. Using untreated rock salt over BHC treated salt will cost your agency more money even at 25°F and above.

This is exactly why we say: "The initial cost of a salt pre-wetting agent has little to do with saving money! Saving money has everything to do with the performance of your salt!" The sooner you focus on the performance of your salt, rather than the price of your pre-wetting agent, the sooner you'll experience significant savings!

Untreated Salt Cost Calculator

How much does untreated salt really cost?

Cost of Untreated Salt

Tons of untreated salt used per season	1,000	
Cost of untreated salt per ton	$75.00	
Total cost of untreated salt per season	$75,000.00	$75,000.00

Cost of *BEET HEET® Concentrate* Treated Salt

Tons of ***BEET HEET®*** treated salt needed to melt the same amount of ice	605.4	
Cost of salt to be treated with ***BEET HEET® Concentrate*** per ton	$75.00	
Total cost of salt to be treated with ***BEET HEET® Concentrate*** per season	$45,405.00	$45,405.00
Gallons of ***BEET HEET® Concentrate*** required @ 5 gallons per ton	3,027	
Cost of the ***BEET HEET® Concentrate*** per gallon with freight to midwest	$1.42	
Total cost of the ***BEET HEET® Concentrate*** per season	$4,298.34	$4,298.34
Total cost of ***BEET HEET® Concentrate*** treated salt		$49,703.34
Total saved by using *BEET HEET® Concentrate* treated salt rather than untreated salt		**$25,296.66**

Untreated salt will actually cost your agency 50.9% more than *BEET HEET® Concentrate* treated salt!

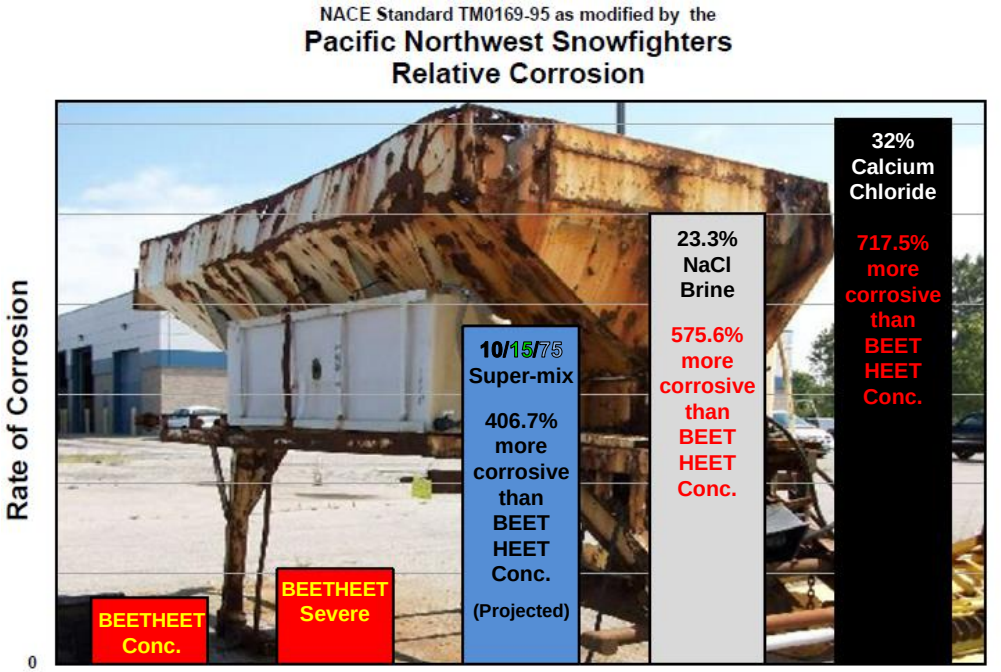
BEET HEET®

CORROSION DATA

How does BEET HEET® Concentrate (BHC) compare to other popular deicers when it comes to corrosion value?

- **32% calcium chloride is more than 700% more corrosive than BHC.**
- **23.3% sodium chloride brine is 575% more corrosive than BHC.**
- **A typical "super-mix" deicer containing 10% 32% $CaCl_2$, 15% beet juice and 75% 23.3% NaCl, is 400% more corrosive than BHC.**
- **Deicers containing beet juice and 23.3% NaCl brine are significantly more corrosive than BHC and they don't even contain performance enhancing exothermic chlorides.**

K-Tech uses all natural sugars to reduce BHC's corrosion rate. Many, if not all, deicers claiming similar corrosion rates contain added chemicals to reduce corrosion values because they do not contain enough sugar to reduce corrosion values much. BHC contains no added corrosion inhibiting chemicals, just all natural sugar.



BEET HEET®

TECHNICAL DATA SHEET

DESCRIPTION

BEET HEET® Concentrate (BHC) is an organic based, corrosion inhibited, liquid deicer.

BHC is a ready-to-use salt stockpile treatment. BHC can also be cut 50/50 with low cost 23.3% Sodium Chloride (NaCl) brine to create BEET HEET® Severe (BHS) a low cost, high performance, salt pre-wetting agent or direct application deicer/anti-icer.

COMPOSITION

Beet Molasses (Liquid Sugar)
Calcium Chloride (Liquid $CaCl_2$) (Exothermic Chloride)
Magnesium Chloride (Liquid $MgCl_2$) (Exothermic Chloride)
Potassium Chloride (Liquid KCl) (Non-exothermic Chloride)
Sodium Chloride (Liquid NaCl) (Non-exothermic Chloride)

PERFORMANCE

BHC, contains more total active ingredient than any deicer in North America.

BHC and BHS have greater ice melt capacities than 32% $CaCl_2$, 28% $MgCl_2$, and “beet juice” deicers, at all temperature ranges.

BHC and BHS provide far superior anti-bonding and residual effects than 32% $CaCl_2$, 28% $MgCl_2$, and 23.3% NaCl deicers.

ENVIRONMENT

BHC and BHS have passed the rigorous testing standards of the Pacific Northwest Snowfighters and are listed on the **PNS Qualified Products List**.

BHC is **99% biodegradable**, and achieves the “**readily biodegradable**” criteria by day 8.

Due to superior ice melting and residual performance, no other salt pre-wetting agent in North America can **reduce chloride emissions** as much as BHC and BHS.

TYPICAL PROPERTIES

Appearance	Dark Brown Liquid
pH	6.0 – 8.0
Specific Gravity	1.28 – 1.30
Lbs. Per Gallon	10.65 – 10.85
Solids Content	>51%
Odor	Chocolate/Syrup/Coffee.

BEET HEET®

THE RED HOT GREEN DEICER

Best Ice Melter Period!

Your options

Lowest Priced Concentrate Available!

Self-cut Concentrate

BEET HEET® CONCENTRATE with **3 Chlorides** & **3 Carbohydrates** = $1.16 per gal

BEET HEET® CONCENTRATE cut 1:1 with your brine to make **BEET HEET® SEVERE**

BEET HEET® CONCENTRATE cut 2:3 with your brine to make **BEET HEET® MODERATE**

BEET HEET® CONCENTRATE cut 1:2 with your brine to make **BEET HEET® TYPICAL**

Self-Blended "Super-Blends"

Costing examples with self-manufactured NaCl brine at $0.16 per gallon

BEET HEET® SEVERE = 50% **CONCENTRATE** + 50% NaCl = $0.66 per gal

BEET HEET® MODERATE = 40% **CONCENTRATE** + 60% NaCl = $0.56 per gal

BEET HEET® TYPICAL = 33% **CONCENTRATE** + 67% NaCl = $0.50 per gal

PRICES DO NOT INCLUDE FREIGHT

Notes

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