Liquid De-icing

A Sustainable Replacement for Traditional Dry Salt Application

What is a Liquid De-icer?

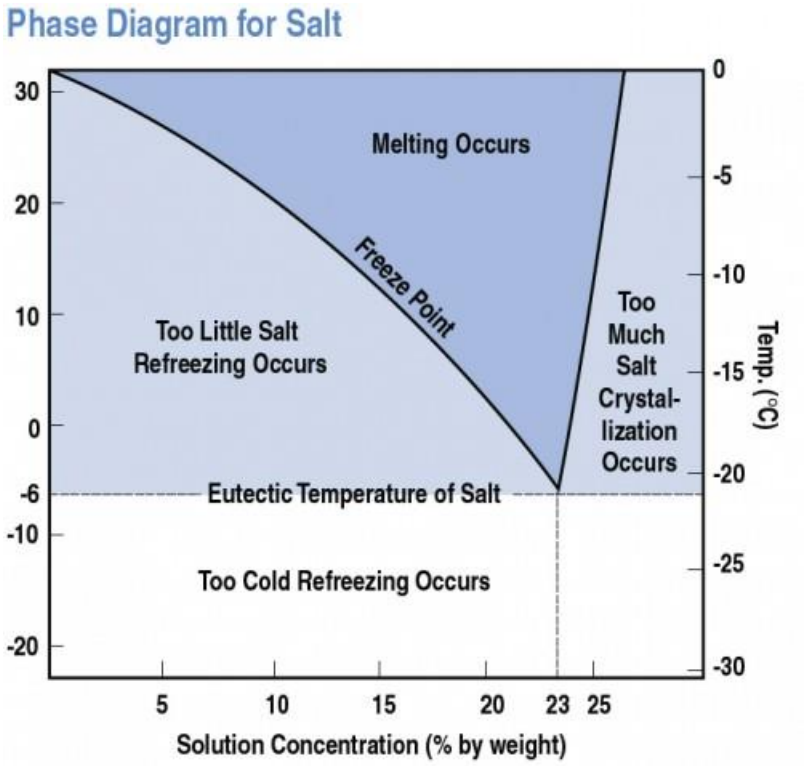
- A liquid de-icer is nothing other than a dry, solid de-icer (like rock salt or calcium chloride or magnesium chloride flakes) that has been dissolved in water to make a solution
- Most common liquid de-icer is Salt Brine – it is a 23.3% salt solution that has a freeze point of -21
- 23% Salt Brine is 1 KG of Salt Dissolved in 4L (1 Gallon) of Water

Salt Brine as a Liquid De-icer

Salt Brine Alone cannot meet all the melting demands that are required in winter conditions

Salt brine must be blended with additives to create a liquid de-icer that can handle all the varying ice control situations

Additives change the freeze point and melting capacity of the salt brine to increase effectiveness



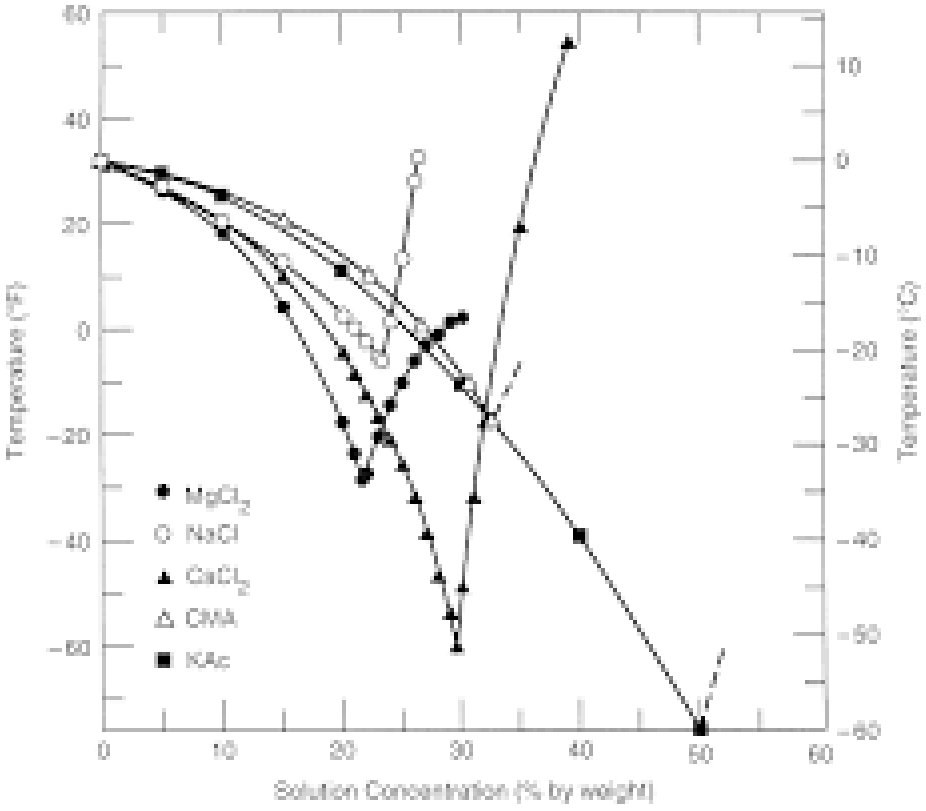
Additives for Liquid De-icing

Common brines to blend with salt brine are

Calcium chloride

Magnesium Chloride

Carbohydrate de-iciers – organic based sugars



Blending Guidelines CaCl

			PERCENTAGE			
GROUND TEMP			SALT BRINE	CACL		
-4	ABOVE		100			
-5	-10		90-99	1.00	10	
-10	-15		80-89	11	20	
-15	-22		70-79	21	30	
-22	BELOW			31		
STANDARD APP RATES						
	GAL / AC					
	75-85		LIGHT SNOWPACK AND AFTER PLOW GLAZE			
	90-120		HEAVY SNOW OR BAD ICE			

Brine Blending Literature

- Salt Brine Blending to Optimize De-icing and Anti-Icing Performance , Minnesota State University
- Performance Rating of De-icing Chemicals for Winter Operations, Barbara M. Gerbino-Bevins
- *S M Hossain (2015). Optimum De-icing and Anti-icing for Snow and Ice Control of Parking Lots and Sidewalks.*

Application of Liquid De-icer

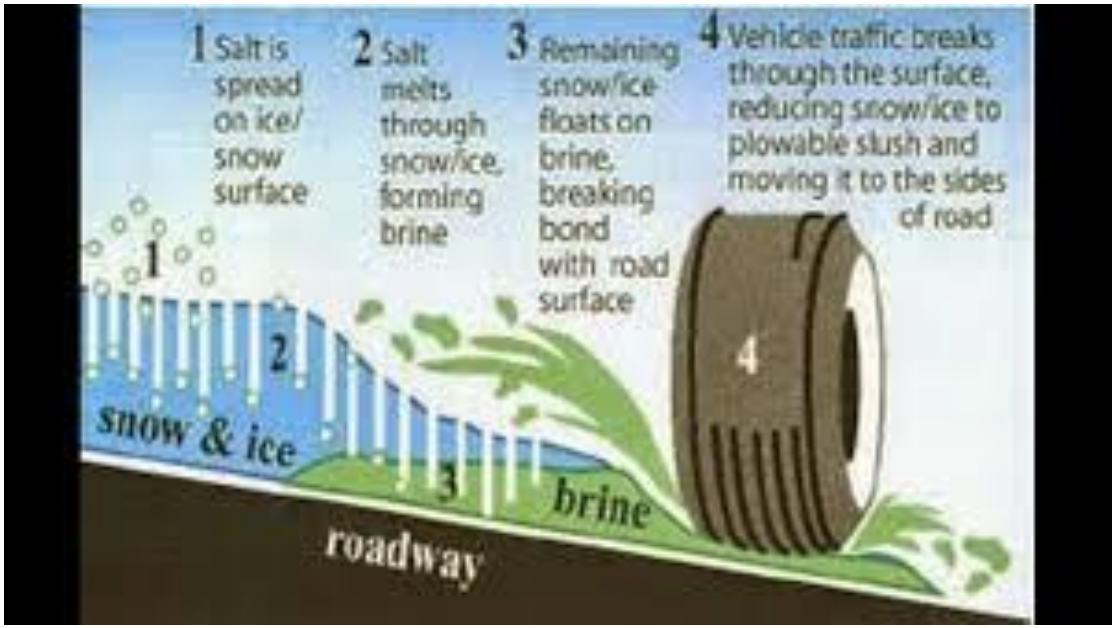
Much like anti icing is done through the use of truck mounted spray bars that apply the liquid directly to the surface in a stream or fan, but at higher application rates to melt accumulated snow and ice.

Anti Ice Application rates are 40-60 gal/Acer

De-icing Application rates 80-120 gal/acer

When is Liquid De-icer Applied?

Liquid de-icer is applied at similar times as rock salt. It can be applied after plowing to remove snow and ice residue from plowing operations and it can be applied after a snowfall to melt through accumulated snow and ice.



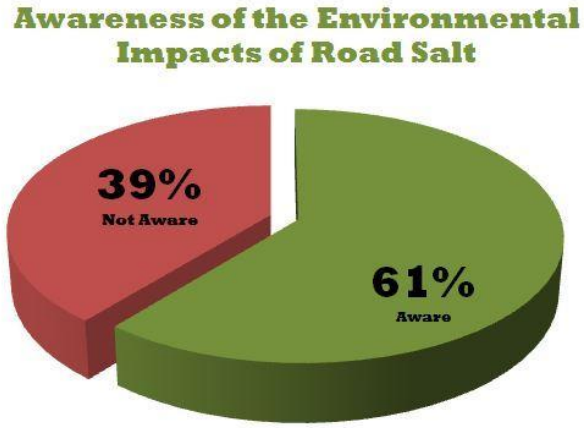
Challenges facing Liquid De-icing

- No evidence of de-icer application because there is little to no residue left on the surface
- Must have an advanced understanding of snow and ice management
- Need detailed ground temp forecasts
- Salt quality
- Limited product suppliers
- Customers are not educated about the service
- Snow and ice management practices would need to be revised
- Infrastructure changes are required for the contractor
- Limited training material is available and what is provided mainly focuses on anti icing

Why Use Liquid De-icer?

Environmental concerns

- A 70% reduction of salt vs dry application
- Eliminate over application of products
- Stop killing the vegetation around the surfaces that are being maintained for the winter
- The opportunity to provide a chloride free service for snow and ice management
- Growing concerns about our de-icing methods



Liquid De-ice Economic Benefits

- Melt snow and ice in lower temperatures
- More consistent level of service through various winter conditions
- Liquid De-icer does not track into buildings like solid products do, quite a savings for Janitorial services in the winter months
- Cleaner finish to surfaces after application than solid material
- More efficient use of labour and equipment

Conclusions

- The current model of salt application is not sustainable
- If we want to be market leaders then we have to lead because without leadership there will be legislation
- Liquid De-icing provides a economic solution to use of dry salt while providing the safe conditions that we have come to expect in the winter

Thank You

- J. Dion Sararus

www.liquidsrevolution.com
dion@dundeenursery.ca

.