



High Performance De-Icing and Anti-Icing Solution



www.innovativecompany.com
Call 1.800.387.5777





MeltDown™ provides a variety of applications in one, non-toxic, cost-effective product.

ANTI-ICING – “From the Bottom Up”

As an anti-icer, **MeltDown™** provides superior “anti-bonding” properties, allowing removal of snowpack with simple plowing.



DE-ICING – “From the Top Down”

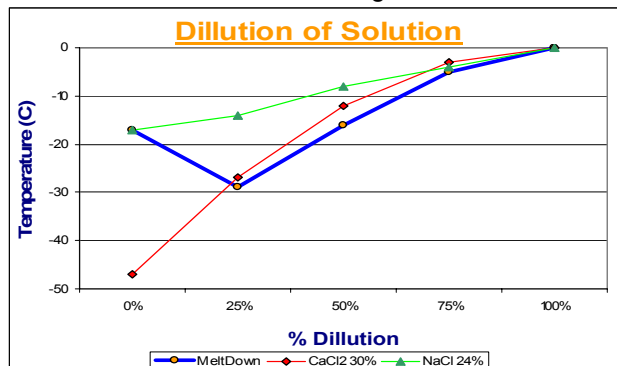
As a liquid de-icer, **MeltDown™** provides increased performance vs. other liquid products. When applied in a stream pattern, **MeltDown™** vertically penetrates the snowpack and breaks the bond at the road surface

PRE-WETTING - SALT

As a pre-wetting agent for salt and sand, **MeltDown™** reduces bounce and scatter, increases the speed at which the salt begins working, increases the melting capacity of the salt, and facilitates the use of salt at lower temperatures.

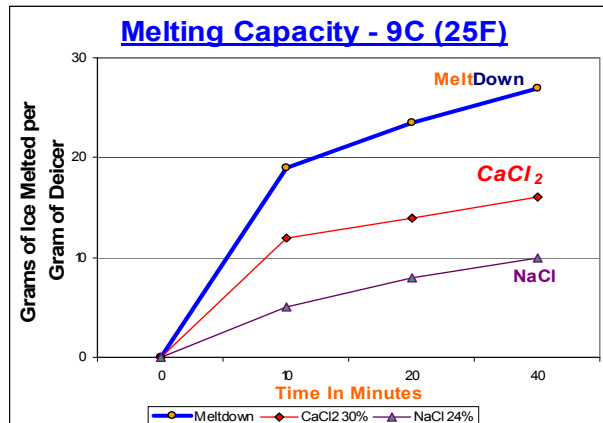
Typical Performance Properties:

MeltDown™ de-icer has a low eutectic point that works effectively in a wide variety of temperature ranges. The flatter sloped curve in the phase diagram illustrates an improved all weather performance versus significantly steeper phase curves associated with calcium and sodium chloride brines. **MeltDown™** has a greater ability to dilute and hold water before refreezing.



Superior Melting Capacity:

Melting capacity research done by SHRP (Strategic Highway Research Program) procedures show that **MeltDown™** consistently outperforms other de-icing materials. Greater melting capacity means a longer lasting product which allows you to use less product, increase coverage area and improve equipment utilization all at the same time. (SHRP H-205.8).



Additionally, **MeltDown™** also reduces corrosion, inhibits crystal formation and product fallout at lower temperatures, and improves roadway traction when compared to other liquid products.

Typical Corrosion Performance:

MeltDown™ de-icer passes the test developed by the National Association of Corrosion Engineers Standard TM-01-69 as modified by the PNS. The specification set by the PNS is 70% less corrosive than salt.

Metal Corrosion Tendency

Deicing Fluid	PNSDOT Relative Corrosion Rate
Distilled Water	0
Rock Salt (NaCl)	100
Calcium Chloride (CaCl ₂) 30%	121
Magnesium Chloride (MgCl ₂) 30%	80
MeltDown™ Inhibited	10.76

Total Immersion Corrosion ASTM F483

Test Metal Coupon	SAEAMS 1424 Requirements Weight Loss, mg/cm ² /24h	Results
Carbon Steel	0.8 max.	<0.05
Galvanized Steel	N/A	<0.75
Aluminum 2024 Anodized	0.3 max.	<0.01
Aluminum 2024 Alclad	0.3 max.	<0.01
Aluminum 7075 Alclad	0.3 max.	<0.01
Copper	Not Established	<0.01

Chlorides Compared:

Magnesium chloride and calcium chloride solutions cannot be compared at equivalent solution percentages due to the fact the materials have different molecular weights. Comparing the weights of the two compounds shows that calcium chloride (111) weighs 17% more than magnesium chloride (95). Therefore, if you have identical percentages by weight of the two solutions, then there is 17% more magnesium chloride in solution by volume than calcium chloride. The following table shows equivalent solutions by weight between magnesium chloride and calcium chloride.

Magnesium Chloride	Calcium Chloride
30.0%	35.0%
28.0%	32.7%
26.0%	30.4%
24.0%	28.0%

There is also a difference in the size of the molecules of the two chemicals. The Magnesium Chloride molecule is smaller. The ice melting capability of each chemical is dependant upon the bond between the negative ions of the water molecules and the positive ions of the metals (Mg & Ca). The bond keeps the water molecules in a liquid state and prevents freezing at low temperatures.

Both metal ions (Mg & Ca) have the same charge, but with the Magnesium molecule being smaller, the charge is distributed across a smaller surface area, resulting in a stronger and denser electrical field. The stronger the electrical field, the tighter the bond between the Magnesium molecule and the attached water molecules.

The strength of this electrical field and the tighter bond it forms with water determines its ability to stay active as a liquid. As an ice melter, the water molecules bonded to the Magnesium or Calcium molecule will not freeze and remain a brine.

Looking at the number of water molecules attached to Magnesium and Calcium molecules allows us to determine the more effective product:

Attached Water Molecules:			
Temperature (C°)	Temperature (F°)	Magnesium Chloride	Calcium Chloride
-15°	5°	12	6
-4°	25°	8	6
0°	32°	6	6
30°	86°	6	4

Clearly the Magnesium chloride has the distinct advantage as it has more water molecules attached to it at relevant ice melting temperature levels.

Applications:

MeltDown™ is specifically designed for anti-icing, direct application de-icing, frost prevention, and prewetting of solids (salt and sand).

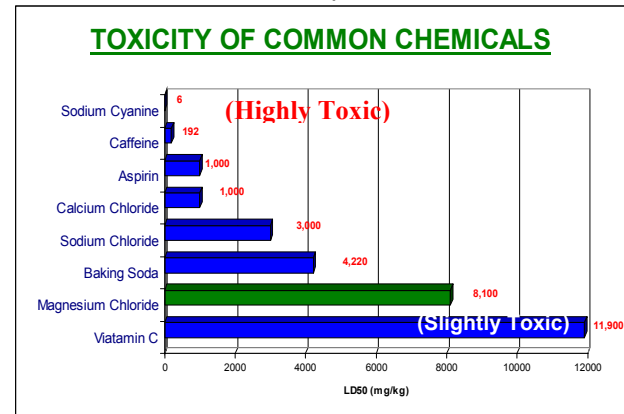
When used for anti-icing operations, application rates of 40-70 litres per lane kilometer (20-30 gallons per lane mile) are typical (up to 90 litres per lane kilometer should be considered the maximum in any anti-icing situation). In direct application de-icing, 90-100 litres per lane kilometer (40-60 gallon per lane mile) applications are used. For frost prevention, application rates of 20-40 litres per lane kilometer (15-20 gallons per lane mile) are employed. These rates can vary depending upon storm conditions and service level goals.



As a pre-wetting agent, **MeltDown™** can be used at rates from 20-40 litres per tonne (5-15 gallons per ton) of substrate, depending upon the solid used and the performance objective.

Health, Toxicity and Environmental:

MeltDown™ is the least harmful of common deicers to vegetation and groundwater according to independent studies conducted by the US Department of Agriculture. It is non-irritating and safer to handle and won't cause burning or stinging associated with alternative products.



MeltDown™ also meets or exceeds all the purity requirements as set by the PNS (Pacific Northwest Snowfighters Coalition).

MeltDown™ is free of toxic metals and substances, and is used as a dust control agent and fertilizer for crops such as turf and small grains. For more information about the PNS and PNS approved products visit their website at: www.wsdot.wa.gov/partners/pns/html/resources.htm

	MeltDown™	PNS Specifications
Arsenic	< 3.00	5.00 ppm Max.
Barium	<10.00	10.00 ppm Max.
Cadmium	< 0.15	0.20 ppm Max.
Chromium	< 0.10	0.50 ppm Max.
Copper	< 0.10	0.20 ppm Max.
Cyanide	<0.05	0.20 ppm Max.
Lead	<0.50	1.00 ppm Max.
Mercury	< 0.05	0.05 ppm Max.
Selenium	< 0.30	5.00 ppm Max.
Zinc	<10.00	10.00 ppm Max.
Phosphates	<10.00	25.00 ppm Max.



**Environment
Canada**

**Environnement
Canada**

Salt Toxicity:

Environment and Health Canada have included road salts among 25 substances on their “second Priority Substances List” (PSL 2) now being assessed for the potential risk to the environment and human health. Results from these assessments will be used to determine whether these substances should be declared toxic under the Canadian Environmental Protection Act (CEPA).

The use of chloride compounds, (sodium, calcium and magnesium), for road use does indeed have an impact on the environment (water quality, plant or animal biota).

MeltDown™ utilized as part of a complete pro-active winter maintenance program can greatly reduce the chloride load being emitted into our environment.



Innovative Winter Solutions:

MeltDown™ is one of a complete line of innovative and environmentally responsible products brought to you by the Innovative Group. **MeltDown™** is a performance leader working effectively, even in the harshest of Canadian climates. **MeltDown™** is safe for use around plants and animals as well as being less harmful to road surfaces and metals.

As part of a comprehensive winter snow fighting strategy, **MeltDown™** improves safety and service levels, reduces equipment and maintenance costs, reduces the chloride load on the environment, reduces particulate matter emissions (sand) and clean-up costs, while saving budget money at the same time.

For more information on our comprehensive winter snowfighting training programs or **MeltDown™ Liquid please contact the Innovative Group.**



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