STREAMLINE SUPPLY

Service, Supplies, Satisfaction, Simplified, Guaranteed

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Streamline's Blue Heat Melts to -15°F - Compared to other common deicers, we believe a blended product using the most effective "exothermic" chloride available as a coating, "calcium chloride", on the least expensive, most commonly used deicer, "sodium chloride", used as a carrier and added rust inhibitors to protect metals, is the answer to fast melting, low temperature, cost effective, controlled temperature, deicing. We have proven that our blended products melt faster, last longer, and do less damage if properly applied.

Streamline's Melting Mountains Melts to -25°F – Is the exact same product as our Blue heat except it has not only the coating of calcium chloride but also the pellets blended in to increase the effectiveness in extremely cold temperatures and increase the concentration of the deicer to allow you to apply less. When used properly on side walks and areas by vegetation, this will lower the amount of vegetation damage because you are applying less chlorides to accumulate in the soil.

Streamline's Superior Low Temperature Performance

When the ***goal is keeping sidewalks safe under all conditions***, it pays to know the ***lowest effective temperature*** for various ice melters and choose one that is effective at the coldest temperatures you are likely to experience. Our ***Blue Heat*** and ***Melting Mountains*** has been proven to be one of the most effective blends because of the materials we have chosen to blend. Calcium chloride stands apart from other options, maintaining ice melting power down to -25°F (-32°C). In contrast, other deicers like rock salt, potassium chloride and calcium magnesium acetate begin losing effectiveness between 25°F (-4°C) and 0<°F (-18°C). Sodium chloride is an effective deicer once you get the melting started with an "***hygroscopic***" (moisture gathering), "***exothermic***" (heat generating) coating. We control the possible spalling damage by dispersing the calcium chloride. We lower the amount of "vegetation damaging" chlorides being applied, by you needing to use less product because the product works even in the coldest temperatures at night or in the shade.

SELECTING THE BEST DEICER

Several performance characteristics should guide the selection of an ice melt product, but two are particularly important:

- **How well does the low temperature performance of the material match the coldest temperatures you are likely to experience?**
- **How quickly will the material melt ice to minimize pedestrian exposure to potentially dangerous conditions?**

To evaluate the performance of deicers against these two needs, it helps to understand that, for ice to melt, the deicer must dissolve in to water to lower its freeze point. This creates a solution that melts the ice on contact. In the case of chloride based deicers, the solution is referred to as a "brine".

Even though it may not be visible, molecular water is always present on the surface of ice. The amount of water increases at higher temperatures and is reduced when the temperatures are colder. If solid deicer is thrown on ice that has little water on its surface, melting can be slow to develop.

So which deicers are likely to dissolve more quickly and at colder temperatures?

Because the surface of ice isn't very wet, you want a ***hygroscopic*** deicer that strongly attracts any available moisture from the surface and the surrounding air so it can begin to dissolve even though conditions are relatively dry. You also want a deicer that ***accelerates***

melting by chemically reacting with moisture to release significant heat. Ice melters that release heat are called ***"exothermic"*** and can be expected to melt ice more quickly and at very cold temperatures.

Some deicers are ***"endothermic".*** Rather than releasing heat, they must draw heat from the surroundings to dissolve. These deicers ***work more slowly*** than exothermic products, especially when temperatures are very cold and when little surface moisture is present to help them dissolve.

Following is a brief overview of the most widely-used ice melting materials and their performance characteristics.

Rock Salt (Sodium Chloride, Solar Salt, NaCl) – Rock salt is widely used, largely because it is readily available and inexpensive. However, rock salt is ***endothermic***. It must draw heat from the surroundings to form an ice-melting brine. **With a lowest effective temperature of +20°F (-7°C)**, rock salt is a relatively slow and ineffective ice melter when temperatures are coldest. Like all chloride-based materials, rock salt is moderately corrosive to unprotected common metals. Lawns and other plants can be harmed if rock salt deicer is over-applied or large quantities are directly applied to grass or vegetation.

Calcium Chloride ($CaCl_2$) – Calcium chloride is the most widely used non-sodium chloride deicer. Its lowest effective temperature**, -25°F (-32°C)**, is below that of other common deicers. Calcium chloride is a ***hygroscopic*** material that attracts moisture from its surroundings, speeding the creation of brine to give melting action a ***fast start***. Calcium chloride is also ***exothermic***. **As it dissolves in contact with moisture, it releases a significant amount of heat.** This makes **commercial products containing high levels of calcium chloride faster ice melters and more effective at colder temperatures** than rock salt and other products which must draw heat from their surroundings to dissolve and form brine. In fact we have found if over applied to one area the heat generated from this product can cause spalling of the concrete because of the intense heat that is chemically generated.

Like all chloride-based materials, calcium chloride is moderately corrosive to unprotected common metals but, in general, there is little difference in corrosion between the various chloride-based deicers, including rock salt (sodium chloride), magnesium chloride and calcium chloride. As with other chloride-based ice melters, **over exposure to calcium chloride can harm lawns and other plants if deicer is over-applied or large quantities are directly applied to grass or other vegetation.**

Magnesium Chloride ($MgCl_2$) – Like calcium chloride, magnesium chloride is a hygroscopic material, able to attract moisture from the air. However, unlike calcium chloride, solid magnesium chloride is a hexahydrate salt, meaning it is 53% water by weight. Because this solid product is so dilute, more must be applied to deliver ice melting capacity equal to calcium chloride or sodium chloride. When the water content of solid magnesium chloride is factored into the measurements used to assess melting performance, the results show that it is somewhat **less effective than sodium chloride (rock salt) after 20 minutes at 20°F**, even though it is typically more expensive. Magnesium chloride is exothermic but does not release as much heat as calcium chloride**. It has a lowest effective temperature of 0°F (-18°C).**

Like all chloride-based materials, magnesium chloride is moderately corrosive to unprotected common metals but, in general, there is little difference in corrosion performance between the various chloride-based deicers. **Chloride overexposure can harm lawns and other plants if deicer is over-applied or large quantities are directly applied to the grass or vegetation.**

Domestically produced magnesium chloride is predominantly available in the western U.S. However, magnesium chloride is also imported from Europe and the Middle East, and six to eight week resupply lead times are not uncommon when ***North American inventories become low during peak winter demand. This can affect the reliability of magnesium chloride supply.***

Potassium Chloride (KCl) – Endothermic properties and a **lowest effective temperature of +25°F (-4°C)** limits the use of potassium chloride for ice melting. The material ***performs more slowly than calcium chloride, rock salt and magnesium chloride*** with relatively low melt volume capability. Like other chloride materials, there is moderate potential for corrosion and environmental impacts.

Urea – Urea is also ***endothermic*** and has a relatively high **lowest effective use temperature of +25°F (-4°C)**, which limits its use during typical winter conditions in northern regions and at higher altitudes. The material exhibits relatively **slow ice penetration and low melt volume** capability compared to other materials. **Although urea is lower in toxicity to plants and wildlife than chloride-based products, high organic content can elevate biological oxygen demand in rivers and lakes, posing a threat to aquatic life.**

Calcium Magnesium Acetate (CMA) – CMA is an expensive material typically sold in blends with rock salt or other lower cost materials. It has a **lowest effective temperature roughly equivalent to rock salt, about +20°F (-7°C)** and CMA **exhibits low ice penetration and low melt volume capability**. The relatively small percentage of CMA material present in common blends **makes little contribution to the overall performance** of the blended product. Like urea, CMA is lower in toxicity to plants and wildlife than chloride-based products, but the material's **high organic content can elevate biological oxygen demand in rivers and lakes, creating a potential threat to aquatic life.**