Strasser Hardware Info Sheet

Ice Melters

MYTH: If I throw ice melter on the driveway, the ice will magically go away. The purpose of an ice melter is not to eliminate snow or ice, but to cut through and break the bond with the surface below. Once the bond is broken, ice and snow can be swept, shoveled or scraped away.

MYTH: If a little is good, a lot should be better. Too many people use way too much ice melter. Ice melters should be spread like chicken feed. When distributed properly, ice melters do their job and disappear. When spread too thickly, they clump and can be tracked into the house or melt into a solution that can damage lawns and shrubs.

Not all ice melters are created equal. There are basically five types of ice melter — good old rock salt (which is technically sodium chloride), calcium chloride, potassium chloride, magnesium chloride and urea.

Rock salt (sodium chloride): This is the least expensive and the least effective of the five. It is only effective down to 20 degrees Fahrenheit. When it gets colder than that, it does nothing.

Calcium chloride: This is the fastest, most powerful and most expensive of ice melters and is 10 times more expensive than rock salt. It is produced from calcium chloride brine and formed into pellets or flakes. In the pellet form, it burrows down to the under-surface, creates its own heat and melts. It is effective to -25 degrees.

In its flake form, calcium chloride starts out being as effective as the pellet but loses power rapidly and does not “burrow down.” It does provide good traction for a limited period.

Magnesium chloride, potassium chloride and urea: Magnesium chloride is effective down to -13 degrees. Potassium chloride is effective to 10 degrees. Urea is effective to about 15 degrees. Their biggest benefit is that they are easier on the soil and surrounding vegetation than rock salt. Potassium chloride and urea are fertilizers, so they actually help heal the soil. Magnesium chloride is very similar to calcium chloride. The major drawback to magnesium chloride is that it is only 48 percent active and needs to be applied at twice the rate of calcium chloride.

When a person goes into a store to shop for ice melters, they can’t just pick up any bag and expect them all to be the same. They should read the bag just like they do when buying fertilizer. Reading the ingredients will tell you whether you have sodium, calcium, magnesium, potassium chloride or urea, or a combination of several of these.

Sodium chloride is the least expensive. Calcium chloride is the most expensive. The other products and blends are priced in between the two.

Comparing the ice melters

Product	Damaging to plants	Effective to (degrees F)
Rock salt (sodium chloride)	Very	plus 20
Urea (nitrogen fertilizer)	Little	plus 15
Potassium chloride	Little	plus 10
Sodium chloride, calcium chloride, potassium chloride blends	Some	minus 10
Magnesium chloride	Little	minus 13
Calcium chloride	Very	minus 25

(All numbers are subjective and vary based on concentration and combination with other chemicals)

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More to Know

Plants: Potassium chloride and urea are common fertilizers that are often perceived as safe products to use around vegetation. Both fertilizers, however, are used at heavier rates for melting ice then for fertilizing and can damage turf and other plants. Both fertilizers are ineffective as an ice melter at lower temperatures and they can cost up to five times more than salt. Urea does not contain chlorides, so it's less corrosive and safer for use on concrete containing rebar and around steel structures. Most ice melters state they will not harm vegetation when used according to label directions. This can be misleading because there are too many variables in the amount of ice melter used. How much snow and ice must be removed? How many times per year will ice melter be applied? Where does the melted snow and ice go?

Melting temperature: *"Scientifically proven to melt at temperatures to -5 degrees."* This may be true, but this is a laboratory measurement taken in a controlled environment, not a practical ice melting temperature. In a laboratory, a liquid with a 10 percent concentration of salt will freeze at 20 degrees, a 20 percent solution will freeze at 2 degrees, a 23 percent solution will freeze at -5 degrees. It's not likely that you will create an exact 23 percent concentration of salt out on the sidewalks. This is also based on the freezing of a mixed brine solution not the melting action of salt sitting on top of frozen water. The practical ice melting temperature is one at which visible ice melting occurs within 15 minutes of application.
Vegetation

Concrete: According to the Concrete Institute, damage to concrete is primarily the result of freeze-thaw cycle on poor quality concrete. The chemicals sodium chloride and calcium chloride have very little effect on concrete. Ice melters, however, do increase the number of freeze/thaw cycles in a given season.

Freeze-Thaw cycle: To understand this cycle, imagine the moisture from melting snow and ice seeping into the pores of concrete, stone or wood. As the moisture Re-freezes, it expands and causes stress in the material, thus weakening it. If you concrete is not formulated and poured properly, it will become overly stressed and damage will result. Unfortunately all ice melters will accelerate the frequency of these cycles.

Ice melters also can damage concrete containing rebar. When chlorides in the brine seep into the concrete and come in contact with the rebar, corrosion begins, resulting in concrete cracking. For this reason, chlorides are not recommended for use on concrete containing rebar or around steel structures.

NOTE: In recent years Ice Melter Manufactures have taken to creating blends of different chemicals. This was done for primarily because blends are more effective at melting under varied conditions, reducing damage to concrete and plants, and last longer on the ground. This makes it easier to choose, but harder to tell what is in the bag.

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Frequently Asked Questions

Q: Which form of calcium chloride is better for snow and ice control - pellets or flakes?

A: Pellets provide substantially better snow and ice control. Compared to flakes, which tend to melt horizontally, the melting power of pellets is concentrated. That allows pellets to bore down quickly to the pavement surface where they can begin undercutting the ice.

Q: Which is the least expensive form of calcium chloride for use in snow and ice control?

A: Pellets. Because this form is more efficient, less is needed.

Q: Will calcium chloride work at temperatures below 0ºF?

A: Absolutely. In fact, high concentrations of calcium chloride can melt ice all the way down to minus 50ºF. But in normal use minus 25ºF is a realistic number.

Q: What's the difference between a deicer's theoretical temperature limit and its practical temperature limit?

A: A theoretical temperature limit (eutectic temperature) is the lowest possible temperature at which a deicer at its ideal concentration is capable of working. Deicers become increasingly diluted as they melt their way through ice or snow. They do not remain at their ideal concentration for long. Practical temperature limits, on the other hand, are a more realistic measure of effectiveness because they refer to a deicer's ability to melt through ice and snow under actual conditions in a reasonable amount of time.

Q: Will deicers damage my concrete?

A: Research has shown that deicers don't chemically attack concrete. Damage to improperly constructed concrete is actually the result of the expansion pressures caused by the repeated freezing of water or brine trapped in the concrete. As the number of freeze/thaw cycles increases, it can contribute to concrete damage.

Q: I have concrete that's less than one year old. Can I use a deicer?

A: The concrete industry recommends against using any deicer on newly placed concrete. Concrete that's less than a year old may not yet have reached its full strength. The application of an aggregate such as sand will help provide traction.

Q: Will deicers harm vegetation?

A: Not if applied properly. None of the commonly used deicers - when used as directed - are harmful to grass, shrubs, or trees. However, caution is needed to avoid over-application or concentration of melted slush into a small area. These practices could produce effects similar to those resulting from the over-application of fertilizer, e.g., browning and die back.

Q: Do all deicers track?

A: Yes, all deicers track. As footwear carries melted slush onto the floor surface, a residue is left behind. However, calcium chloride is the only deicer that doesn't leave a powdery, white residue.

The best way to handle tracking is to avoid it through preventative maintenance. The generous use of strategically placed and properly maintained entrance mats will help prevent excessive accumulation of deicer on carpets. More frequent vacuuming and pile lifting are recommended, and routine maintenance procedures such as damp pad, dry compound, and foam extraction should be increased as needed when deicers are in use.