



Ice Melter Facts

There are many factors that should be reviewed when planning your Ice Melter program. The following information provides facts about Ice Melting products that will allow your customer to make an educated decision when choosing their Ice Melter Products.

How Ice Melters Work



When ice melter granules contact ice or snow, they begin to form a brine solution. This brine is central to the melting process, as it will not freeze initially.



The brine becomes more diluted as it melts the ice or snow, until it eventually refreezes. How long it takes for this refreezing to occur depends on the amount of ice melter applied and the effectiveness of each granule.



Some ingredients melt ice at lower temperatures, and prevent refreezing longer than others. For example, rock salt will melt ice down to -15°C (5°F), while urea will only melt ice down to -4°C (25°F).

When to Apply Ice Melters

Whenever the safety of pedestrian or vehicular traffic is threatened by a buildup of snow or ice, action should be taken to reduce the risk. The use of granular ice melters should be part of an ice control strategy, along with physical removal of snow and ice.

By applying an ice melter before precipitation begins, you can prevent ice from bonding to the traffic surface, and simplify shoveling or plowing. However, pre-application may cause a brine to refreeze under a heavy snow pack if shoveling or plowing does not occur in a reasonable time. Pre-apply only if you are sure physical snow removal can be accomplished soon after.

Here are some guidelines for applying ice melter after precipitation has fallen:

Dry Powdery Snow: Can be shoveled or swept, and may not require the use of Ice Melter.

Sleet/Freezing Rain: Apply Ice Melter early to prevent ice build up.

Wet/Heavy Snow: Apply as soon as wet/heavy snow begins falling to prevent it from bonding. When more than two inches accumulate, shovel excess snow and reapply if necessary.

Large Accumulations Of Snow: Anytime the snowfall amounts to more than two inches, plow or shovel first. Then use Ice Melter to melt the stubborn layer of ice or hard packed snow that remains.

Precautions

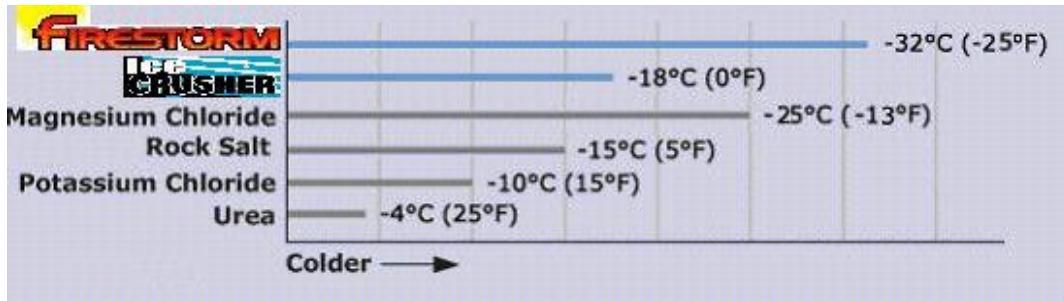
Apply at labeled rates. Use a spreader or application unit. Spread evenly. Do not over-apply, especially around vegetation, metals and concrete.

Effective Melting Temperature

A term commonly used to compare different ice melters is "Effective Melting Temperature", which means the lowest temperature at which an ice melter will realistically melt ice.

Many ice-melting products use a blend of ingredients. Rock salt is often a major component of these formulations. These blends may contain ingredients that melt at a lower temperature than rock salt, but if the blend is mostly rock salt, it will be unlikely to melt much below -15°C (5°F). Independent testing of the entire formulation, not just one ingredient, should support a manufacturer's claims on melting temperature. Otherwise, they should be viewed with "a grain of salt." HLF can back up its claims with a complete technical support package.

Proven Ice Melting Temperatures



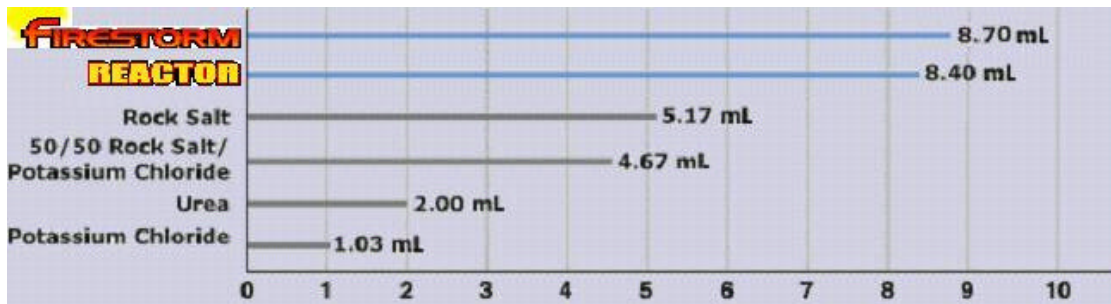
Melting Speed and Extended Melting

Two additional factors used to compare ice melter performance are melting speed (or rate of melting) and extended melting. Melting speed is limited by the nature of the ingredients used, and environmental conditions. Ingredients that chemically react with moisture tend to melt quickly. However, lower temperatures reduce the melting speed of all ingredients. If temperatures drop enough, the melting action ceases almost completely.

The primary ingredient will largely determine the melting speed and rate of melting. Typically, ice melters that start melting quickly tend to stop quickly and often require frequent applications to prevent refreezing. Ice melters that provide an extended melting action remove a higher volume of ice and snow and are usually more economical.

Firestorm and Reactor Ice Melters are two ice melters that have both fast melting and extended melting properties. It starts to melt as quickly as straight calcium, but lasts as long as other sodium/potash blends.

Below is a graph of melt volumes produced in 20 minutes at -10°C (14°F).

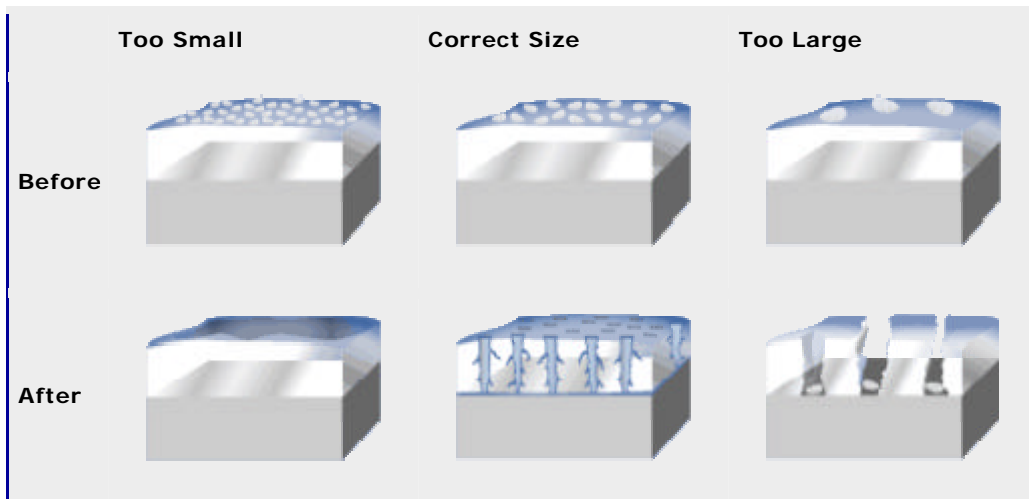


Ice Melter Granule Size

An ice melter's granule size and surface area both affect the melting process. Small granules melt too quickly, and a large amount of them can get the melting process off to a fast start. However, they may completely dissolve before they penetrate all the way through an ice layer. If this diluted brine refreezes on top of the ice, it can create an even slicker and more dangerous surface.

Larger particles have a comparatively slower melting action. They will likely penetrate through an ice layer, but may not be completely dissolved into an underlying brine layer. The unused materials can reduce melting efficiency and increase cost.

Ice Melter Granule Size Comparison Chart



The most effective ice melters use consistent, medium sized granules which can bore through the surface and maximize brine formation. This breaks the ice-to-surface bond, allowing easy removal of the remaining ice. Products that are mined, such as rock salt, may contain a wide range of particle sizes with unpredictable and uneven melting characteristics.

Ice Melters and Pets

Ice melters are relatively safe to pets, but a few precautions should be taken to protect pets, floors and carpets.

Animals like salts, and it is a good idea to prevent pets from licking ice melter granules. Keep them indoors while the ice melter is applied.

To prevent pets from tracking residue on floors and carpets, keep a rag or towel near the door and wipe ice melter residue from their paws.

Ice Melters and the Environment

If used improperly, "salts" from chloride based ice melters can have adverse environmental effects such as damage to plants, build-up in the soil and threat to aquatic life from excessive runoff. Be sure to apply ice melters according to manufacturers' instructions and avoid excessive application where melting snow can run into streams, rivers and lakes.

Ice Melters and Vegetation

All ice melters that contain chlorides release salts as they form brine solutions. Plants vary in sensitivity to these salts, and damage can result from either direct or indirect contact with the ice melter.

Direct Contact damage usually results from shovelling snow containing ice melter onto vegetation, or from inadequate drainage of the brine solution. Excessive concentrations can kill plants.

An ice melter with an environmentally inert marker can make it easier to prevent over application on both concrete and surrounding vegetation.

Indirect Damage can result from a build-up of ice melter ingredients in the soil. They can prevent plants from absorbing water or required nutrients.

Injury to lawns, trees, shrubs and other plants is usually not evident until spring. Avoiding expensive damage to vegetation can be accomplished through several preventive measures:

Use an ice melter with a balanced formulation and a high level of safety to plants.

- Apply at labeled rates - An ice melter with an environmentally inert marker can make it easier to prevent over-application
- Disperse snow or slush over a wide area if possible
- Ask a nursery to recommend plants that are tolerant to ice melters
- Apply ice melter in advance of precipitation, to prevent surface bonding. This will reduce the amount of ice melter needed and make ice removal easier.
- Irrigate plantings very early in the spring to leach out ice melter residues. Beware of manufacturers who claim complete safety to plants. Any ice melter ingredient can kill plants if applied in sufficient quantities.

Ice Melters on Roofs

Ice and snow build-up on the roof can threaten the structural integrity of a building. Applying ice melter before the build-up becomes severe can help avoid problems. Here are some tips for application on a roof:

- Do not use on metal roofs.
- Apply ice melter carefully to minimize damage to plants below.
- Ensure brine can be channelled off quickly through eaves troughs and gutters. Ice melter solution from the downspout has the potential to cause damage to vegetation due to the high concentration discharged in one area. This can be diluted with water to reduce the potential for damage
- Ensure pedestrians are not at risk from falling ice.

Ice Melters and Concrete

Most concrete damage is a result of the natural effects of freeze-thaw cycles, not a chemical attack by an ice melter. Moisture seeps into the surface pores and cracks in the concrete, and as it changes to ice, expands and puts pressure on surrounding surfaces. Stress on weaker areas in the concrete may result in cracking or surface deterioration.

Using an ice melter increases the number of freeze-thaw cycles, and the potential for damage to concrete. However, the hazards and risk of injury associated with slippery surfaces must be weighed against this.

Properly air-entrained concrete designed for cold weather climates (as recommended by the Portland Cement Association) has a network of tiny air pockets that allow it to accommodate freeze-thaw cycles.

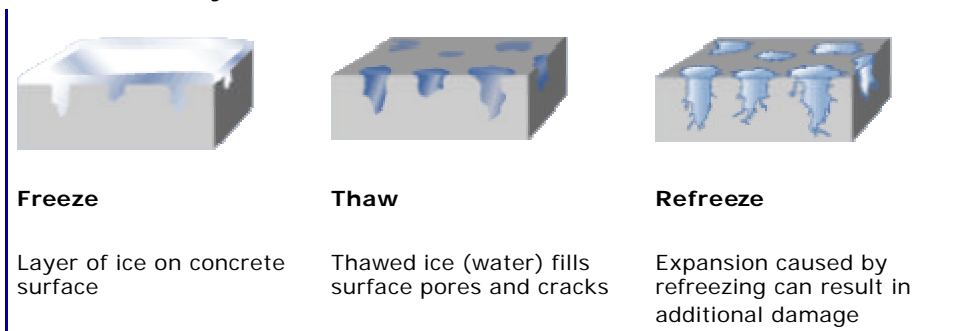
Ice Melters and Concrete cont'd..

Poor quality surfaces may not withstand the stress associated with these cycles. Ice melter is not recommended on the following surfaces; concrete that is less than 1 year old, masonry (stone or brick), precast concrete (steps or paving stones), stone or concrete surfaces that are chipped, cracked, spalled or have exposed aggregate.

Here are some recommendations for reducing the risk of damage to concrete:

- Apply ice melter at recommended rates
- Use a push type or hand held ice melter spreader An ice melter with an environmentally inert dye marker can make it easier to prevent over application
- Use an ice melter with extended refreezing protection
- Remove slush and water before refreezing occurs
- Avoid using ice melters on non air-entrained concrete or other vulnerable surfaces
- Apply a commercial strength sealer when dry

Freeze-Thaw Cycle



Ice Melter Residues on Carpet or Flooring

While ice melter residues are common on sidewalks and parking lots, tracking of ice melters indoors can also result in residues on floors and carpets.

When sodium or potassium chlorides are applied, they melt into the snow to form a brine solution. If the concentration is great enough, a dry white residue may be left after evaporation. These residues are water soluble and are usually easy to remove.

Calcium chloride can also leave a residue on floors. To avoid residue build-up and protect interior surface areas, neutralizing agents and floor conditioners can be used.

On carpeted surfaces, shampooing will remove residues tracked in from ice melters should vacuuming not provide sufficient cleaning action.

Avoid the use of pure traction aids such as sand, which will not melt ice and can scuff polished surfaces.

Residues from ice melters are greatly increased with over application.

Using a coloured ice melter as well as proper application equipment will help to prevent over application.

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