Deicing Chemicals: Why Not to Just Throw Down Salt

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It's important to select and order a supply of ice melting and/or loosening chemicals well ahead of the winter season, before supplies dwindle and prices inflate. While **rock salt (sodium chloride)** may serve to get the job done, it is extremely corrosive to steel and destructive to masonry and concrete. Because of its low cost, rock salt has retained its popularity in spite of these damaging properties, but the small savings in up-front product costs is generally insufficient to justify subjecting building materials to this harmful chemical. Ultimately, it may prove the more expensive choice, when the cost of rehabilitating salt-damaged components is taken into account.

So what are the other options? **Calcium chloride**, while somewhat pricier, is generally the most effective deicing chemical. While detrimental effects do tend to be less severe than with rock salt, calcium chloride is nonetheless a corrosive compound that is damaging to reinforced concrete. Avoiding these harmful properties altogether, however, may mean using a chemical that is somewhat less effective, particularly at lower temperatures.

A number of **proprietary products** are also available which claim to correct the deficiencies of any one compound. These products usually combine various organic and inorganic deicing chemicals, sometimes alongside other performance-improving agents, such as corrosion inhibitors or traction enhancers (e.g. corn starch). While proprietary blends pledge greater effectiveness than their simpler counterparts, they also come at a higher price.

The chemical that is most sympathetic to existing structures—and most highly recommended—is **calcium magnesium acetate (CMA)**; however, CMA does not work at lower temperatures, must be applied before snowfall, and demands expeditious, and, often, continuous snow clearing. An ice loosening chemical, CMA does not melt snow or ice, but rather creates a slurry that interferes with the bond of the ice to the surface, aiding mechanical removal.

Should an ice melting chemical be required, opt for **potassium chloride** or a **proprietary organic ice melting chemical**, or a blend of the two, but not outside their operating temperature range. For colder, more severe conditions, it may be necessary to use calcium chloride or a proprietary blended material to maintain safety. In all cases, application of **grit/sand** greatly increases traction and diminishes the amount of deicing chemical required.

With the high liability of slippery surfaces, it's important to consider snow removal options well before the first snowfall forces last-minute decisions. Pilot test proposed materials to verify suitability and performance, and integrate these into a comprehensive snow and ice removal strategy. Detailed record-keeping in your Winterizing Program log will be instrumental in demonstrating your facility's proactive approach to deicing, should a litigation issue arise. ■

Common Deicing Chemicals

Product	Lowest effective temp.*	Method	Performance	Longevity	Corrosiveness	Concrete freeze/thaw resistance damage
Sodium Chloride (Rock Salt)	20°F	Melting	Very Good	Low	Very High	High
Calcium Chloride	-25°F	Melting	Excellent	Moderate	Moderate to High	Moderate to High
Potassium Chloride	25°F	Melting	Good	Low	Low	Low
Calcium Magnesium Acetate (CMA)	20°F	Loosening	Good (dependent on snow removal frequency)	High	None	None
Urea	25°F	Melting	Used only in special circumstances (e.g. runways)	Low	None	None

*Conditions vary. Test materials to verify suitability and performance.