



Technical Data Sheet

Sno-N-Ice Melter Material Data Sheet

Date prepared: August 26, 2003

Hazardous ingredients:

No substances defined as hazardous present.

Other ingredients:

Sodium chloride CAS 7647-14-5
Calcium magnesium acetate (CMA) CAS 76123-46-1
Sodium silicates CAS 1344-09-8
Urea CAS 57-13-6
Ethanol amines CAS 102-71-6
Magnesium Chloride Hexahydrate CAS 7791-18-6
Potassium Acetate CAS 127-08-2

Physical/ chemical characteristics:

Solubility in water: soluble
Appearance and odor: pink crystalline solid
Fire and Explosion Hazard: Product is not flammable. Not considered a fire hazard
Reactivity data: Hazardous polymerization: cannot occur
Stability: stable
Incompatibility: avoid contact with strong oxidizing agents
Health hazard data: Eye irritant. May irritate sensitive skin. May be harmful if swallowed, especially in large amounts because of presence of a small quantities of alkaline material.

First aid procedures:

Eyes: flush with water. If irritation or redness are severe or persist, consult physician,
Skin: wash off with water.
Ingestion: drink liquids to dilute and consult physician.

Spill or leak procedures:

Small spills: may be flushed away with water or swept up
Large spills: sweep or scoop up for reuse or disposal.

Waste disposal methods:

Small spills: may be sewerred.
Large spills: should be disposed of in landfill according to regulations
Protective equipment to be used: While this product is considered non-hazardous, good industrial practice suggest the use of proper eye protection and the use of gloves.
Special precautions or other comments: Containers of this material may be hazardous when emptied since emptied containers retain product residues (vapor, liquid and/ or solid). All hazard precautions given in the data sheet must be observed
Note: The information accumulated herein is believed to be efficacious and accurate; however, no warranty is made with respect thereto. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

Prepared to comply with OSHA hazard communication standard (29CFR 1910.1200)

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SODIUM CHLORIDE

Also known as common salt, table salt, or halite, is a chemical compound with the formula NaCl. Sodium chloride is the salt most responsible for the salinity of the ocean and of the extracellular fluid of many multicellular organisms. As the major ingredient in edible salt, it is commonly used as a condiment and food preservative.

In cold countries, large quantities of rock salt are used to help clear highways of ice during winter, although "Road Salt" loses its melting ability at temperatures below -15°C to -20°C (5°F to -4°F). Sodium chloride is sometimes used as a cheap and safe desiccant due to its hygroscopic properties, making salting an effective method of food preservation historically. Even though more effective desiccants are available, few are safe for humans to ingest

Calcium magnesium acetate is an alternative to road salt. It is approximately as corrosive as normal tap water, and in varying concentrations can be effective in stopping road ice from forming down to -27.5 °C (its Eutectic temperature).

Benefits

- Low corrosion: less corrosive than tap water
- Safe for concrete: the safest deicer for concrete
- Excellent inhibitor: reduces chloride corrosion
- Safe for the environment: biodegradable, low toxicity
- Residual effect: requires fewer applications
- Multi-purpose: use straight, with salt, with sand, or as a liquid

Performance

- Works best above 20°F (-7°C)
- Has long lasting effect - better than salt or urea
- Breaks/inhibits bond between snow/ice and pavement
- Creates a dry, powdery snow which improves traction

Environment

- Biodegrades to CO2 and H2O
- Calcium and magnesium increase soil permeability
- Essentially non-toxic to aquatic species
- Poor mobility in soil – unlikely to reach groundwater
- Safe for vegetation
- Does not contain nitrogen, sodium, or chlorides

SODIUM SILICATE

Also known as water glass or liquid glass, available in aqueous solution and in solid form, is a compound used in cements,



passive fire protection, refractories, textile and lumber processing, and art.

Concrete and general masonry treatment - Concrete treated with a sodium silicate solution helps to significantly reduce porosity in most masonry products such as concrete, stucco, plasters. A chemical reaction occurs with the excess $\text{Ca}(\text{OH})_2$ in the concrete that permanently binds the silicates with the surface making them far more wearable and water repellent. It is generally advised to apply only after initial cure has taken place (7 days or so depending on conditions). These coatings are known as silicate mineral paint.

UREA

Is a nitrogen-containing chemical product that is produced on a scale of some 100,000,000 tons per year worldwide.

For use in industry, urea is produced from synthetic ammonia and carbon dioxide. Urea can be produced as prills, granules, flakes, pellets, crystals, and solutions. More than 90% of world production is destined for use as a fertilizer. Urea has the highest nitrogen content of all solid nitrogenous fertilizers in common use (46.7%). Therefore, it has the lowest transportation costs per unit of nitrogen nutrient.

Urea is highly soluble in water and is, therefore, also very suitable for use in fertilizer solutions (in combination with ammonium nitrate: UAN), e.g., in 'foliar feed' fertilizers.

Solid urea is marketed as prills or granules. The advantage of prills is that, in general, they can be produced more cheaply than granules, which, because of their narrower particle size distribution, have an advantage over prills if applied mechanically to the soil. Properties such as impact strength, crushing strength, and free-flowing behavior are, in particular, important in product handling, storage, and bulk transportation.

Applications:

- A raw material for the manufacture of various glues (urea-formaldehyde or urea-melamine-formaldehyde); the latter is waterproof and is used for marine plywood
- An alternative to rock salt in the de-icing of roadways and runways; it does not promote metal corrosion to the extent that salt does
- A flame-proofing agent (commonly used in dry chemical fire extinguishers as Urea-potassium bicarbonate)
- An ingredient in many tooth whitening products
- A cream to soften the skin, especially cracked skin on the bottom of one's feet
- An ingredient in dish soap.
- To make potassium cyanate
- A melt agent used in re-surfacing snowboarding halfpipes and terrain park features

MONOETHANOL AMINE

Is produced by reacting ethylene oxide with aqueous ammonia; the reaction also produces diethanolamine and triethanolamine. the ratio of the products can be controlled by changing the stoichiometry of the reactants. pH-control amine - Ethanolamine is often used for alkalization of water in steam cycles of power plants, including nuclear power plants with pressurized water reactors. This alkalization is performed to control corrosion of metal components. ETA (or sometimes a similar organic amine,

e.g., morpholine) is selected because it does not accumulate in steam generators (boilers) and crevices due to its volatility, but rather distributes relatively uniformly throughout the entire steam cycle. In such application, ETA is a key ingredient of so-called "all-volatile treatment" of water (AVT).

MAGNESIUM CHLORIDE

Is the name for the chemical compounds with the formulas MgCl_2 and its various hydrates $\text{MgCl}_2(\text{H}_2\text{O})_x$. These salts are typical ionic halides, being highly soluble in water. The hydrated magnesium chloride can be extracted from brine or sea water. Magnesium chloride as the natural mineral Bischofite is also extracted (solution mining) out of ancient seabeds, for example the Zechstein seabed in NW Europe.

Use as an anti-icer - A number of state highway departments throughout the United States have decreased the use of rock salt and sand on roadways and have increased the use of liquid magnesium chloride as a de-icer or anti-icer. Magnesium chloride is much less toxic to plant life surrounding highways and airports, and is less corrosive to concrete and steel (and other iron alloys) than sodium chloride. The liquid magnesium chloride is sprayed on dry pavement (tarmac) prior to precipitation or wet pavement prior to freezing temperatures in the winter months to prevent snow and ice from adhering and bonding to the roadway. The application of anti-icers is utilized in an effort to improve highway safety. Magnesium chloride is also sold in crystal form for household and business use to de-ice sidewalks and driveways. In these applications, the compound is applied after precipitation has fallen or ice has formed, instead of previously. The use of this compound seems to show an improvement in driving conditions during and after freezing precipitation.

POTASSIUM ACETATE

It can be used as deicer instead of chloride salts like calcium chloride or magnesium chloride. It offers the advantage of being less aggressive on soils and much less corrosive and for this reason is preferred for airport runways. It is, however, more expensive.

Potassium acetate is the extinguishing agent used in class K fire extinguishers because of its ability to cool and form a crust over the burning oils.

Potassium acetate is used as part of replacement protocols in the treatment of diabetic ketoacidosis because of its ability to breakdown into bicarbonate and help neutralize the acidotic state. In molecular biology potassium acetate is used to precipitate dodecyl sulfate (DS) and DS bound proteins, allowing the removal of proteins from DNA. It is also used as a salt for the ethanol precipitation of DNA.

Potassium acetate is used as a food additive (preservative, acidity regulator) found on food labels in the European Union.

Potassium acetate is used in mixtures applied for tissue preservation, fixation, and mummification. Most museums today use the formaldehyde-based method recommended by Kaiserling in 1897 and containing potassium acetate. For example, Lenin's mummy was soaked in a bath containing potassium acetate.

