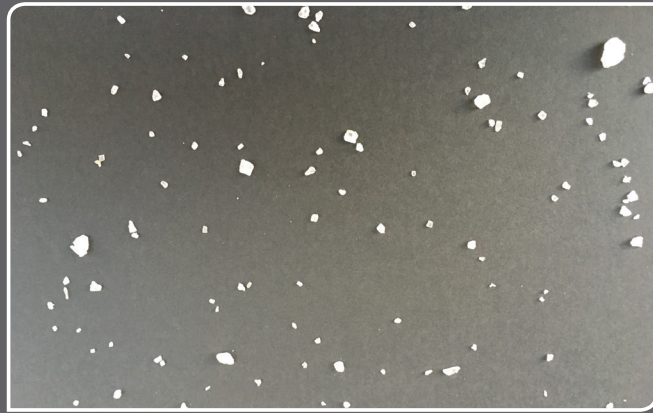


Adequate vs. Excessive Salt Applications



Adequate amount of salt deicer for sidewalks, driveways, and parking lots.



Excessive application of salt deicer for sidewalks, driveways, and parking lots. This can become a slipping hazard.

References

Deicing Resources

1. EPA. Stormwater Fact Sheet: Minimizing Effects from Highway Deicing. September 1999. EPA 832-99-016
2. © 2017 Dane County Winter Application Rates. Anti-Icing (Before the Storm) Application Rate Guidelines. WIWise Partnership, 2017.
3. © 2017 Dane County Winter Application Rates. Deicing Application Rate Guidelines. WIWise Partnership, 2017.
4. Winter Parking Lot and Sidewalk Maintenance Manual. 3rd Edition 2015. Minnesota Pollution Control Agency, www.pca.state.mn.us/programs/roadsalt.html

Stormwater Information

Remember: Streets to Streams No Treatment in Between!

Created for ISWEP member cities and educational organizations to improve water quality through awareness, sustainability, and education.



**IOWA STORMWATER
EDUCATION PARTNERSHIP**

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IowaStormwater.Org



Salt & Deicer Management for Businesses

Winter Stormwater Pollution Prevention Strategies

Protect our Local Streams and Lakes



GlensWelding.com

How Deicers Work

A deicer melts or prevents the formation of ice. It does this by lowering the freezing point of water to prevent a bond from forming between ice and paved surfaces. It is important to have safe streets and sidewalks during the winter months. However, be aware that salt and deicing products and the application methods used can have an impact on water quality in Iowa streams, lakes and ponds.

Concern with Chlorides: The salt that is applied to sidewalks, parking lots, and streets contains a water pollutant called chlorides. Once chlorides get into soil and water ecosystems they don't go away. When snow and ice melt they enter the storm sewer system that drains to local water bodies. Research studies conducted in Minnesota and Wisconsin indicate that elevated chloride levels are occurring in local lakes and streams and shallow groundwater.

Impacts of Salts:

- High amounts of chlorides are toxic to fish and other aquatic life
- Excess salt discharges onto soils near paved surfaces can cause soils to lose their ability to retain water and make them less permeable.
- Salts that percolate through the soil can contaminate groundwater which many cities and residents rely as a source of drinking water.
- Salts can be harmful to pets and wildlife such as birds.
- Corrosion of concrete surfaces, metal infrastructure such as bridges and vehicles is caused by salts.

According to the MPCA Winter Parking Lot and Sidewalk Manual "About 1 teaspoon of salt can contaminate 5 gallons of water."



1. Too much salt was applied to this sidewalk. The excess washed off the surface in the spring thaw.

2. Vegetation was killed and the soil structure disturbed due to high salt use on sidewalks.

Table 1. The most commonly used products and their lowest practical melting temperatures. Range of pavement temperatures, amount of ice melted by 1 pound sodium chloride (NaCl) and the melting time ranges. (MPCA, Winter Parking Lot and Sidewalk Maintenance).

Pavement Temp. °F	1 pound salt (NaCl) Melts	Melting Time
30°	46.3 pounds of ice	5 min.
25°	14.4 pounds of ice	10 min.
20°	8.6 pounds of ice	20 min.
15°	6.3 pounds of ice	60 min.
10°	4.9 pounds of ice	Salt is ineffective and will blow away before it melts anything

Deicing Best Management Practices

Provide Safe Surfaces and Minimize Impacts on Local Streams

1. Start early and remove snow mechanically throughout the storm using a snow plow, snow blower, shovel, or broom before adding any deicers.
2. Temperatures are usually warmer during a snow event and gradually become colder after the event.
3. When using deicers, use only what is needed.
4. Use a hand spreader or calibrated spreader rather than cupfuls to get a more uniform application.
5. Sweep up if too much is used and reuse in a different area or for the next use.
6. DEICERS WILL NOT WORK BELOW -10°F If the weather is too cold don't apply deicers, sand may have to be used. See table 2 below for guidance.
7. Calibrate all mechanical equipment using manufacturers recommendations.
8. Monitor pavement temperatures using temperature monitors.
9. Anti-icing can often be more effective than deicing.



Table 2. List of salt products and lowest effective melting temperatures. (MPCA, Winter Parking Lot and Sidewalk Maintenance)

Salt Type	Lowest Practical Melting Temp.
CaCl ₂ (Calcium Chloride)	-20°F
KAc (Potassium Acetate)	-15°F
MgCl ₂ (Magnesium Chloride)	-10°F
NaCl (Sodium Chloride)	15°F
CMA (Calcium Magnesium Acetate)	20°F
Blends	Check with manufacturer
Winter Sand	Does not melt only provides traction

Information obtained from: Wise Program <https://www.wisaltwise.com/>

Plant Based Deicing Products

Sugar beet, corn, and molasses products are added to salt or salt brine to enhance their performance. They are relatively new products that are still being studied. Some of these products can decrease ice and snow melt capacity, reduce corrosion, and keep deicer on paved surfaces longer.

These plant-based products don't increase chloride concentrations in water bodies but they can use up oxygen, contribute nutrients, and impact some sensitive aquatic life.

Use equipment calibration guidance and application rates recommended in the MPCA Winter Parking Lot and Sidewalk Maintenance. Photo: BeetJuiceSalt.com



The Benefits of Anti-Icing

Anti-Icing Most Effective and More Environmentally Friendly

Anti-icing is one of the most cost-effective practices that can be used for winter maintenance. It is more environmentally friendly compared to deicing because it uses a lot less salt product.

Anti-icing is considered more of a proactive approach; it would be the first in a series of winter storm maintenance activities. The process consists of applying a small amount of liquid deicer to the pavement before a storm arrives to prevent snow and ice bonding to the surface. This assists subsequent snow removal.

It can improve safety at the start of a storm and can provide more efficient cleanup. According to the MPCA Winter Parking Lot and Sidewalk Maintenance Manual, anti-icing can prevent the formation of frost and be effective for up to several days.



Anti-icing used for sidewalks before a snow storm. DeicingDepot.com



Anti-icing streets before a snow or ice storm. MeltSnow.com