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# Guidelines For The Use Of Anti-icing

The Mn/DOT Anti-icing Committee has formulated this booklet to assist with the introduction of anti-icing to the arsenal of winter storm fighting tools. The committee is made up of various employees and management involved with the use and implementation of anti-icing practices throughout the State of Minnesota. The information contained herein is intended as a basic guideline only. This in no way constitutes a specific numbered process or procedure for the use of anti-icing material, chemicals, or equipment. The successful use of anti-icing is a learning process of which knowledge through experience is gained. The use of anti-icing can be a very beneficial tool when used in conjunction with other best practices and methods for snow and ice control.

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## **2. Mn/DOT ANTI-ICING GUIDELINES**

### **A. DEFINITIONS:**

**Anti-Icing:** The application of liquid chemicals\* to prevent the formation of frost or the bonding of snow or ice to pavement. Initial applications can be made either as a pre-treatment in advance of a storm event, or as an early storm period treatment.

**Black Ice:** Popular term for a very thin coating of clear ice which forms on a pavement or bridge deck surface.

**Working Temperature:** Range of pavement temperatures at which chemical will effectively melt ice.

\*In rare instances solids may be used.

### **B. WHEN TO APPLY:**

1. **Application Schedule:** Regularly scheduled applications twice per week on bridge decks and critical areas or on black ice and routes prior to events.
2. **Residual effect** can remain for up to five days after application if the precipitation does not dilute the initial application. Refreezing of the surface

can occur when precipitation or moisture in the air dilutes the chemical on the surface.

3. Magnesium Chloride: pavement temperature –10 degrees F to + 30 degrees F.
4. May be used at lower temperatures with high traffic volume roads.
5. Application - preferred times are during off peak ADT hours.
6. Other chemicals may be applied at different pavement temperature (see Appendix A.)

### **C. APPLICATION RATES:**

	<u>Mag</u>		<u>Brine</u>
1. Regularly Scheduled Applications	15 to 20	Gal/Lane Mile	20-35
2. Prior to Frost or Black Ice Event	15 to 20	Gal/Lane Mile	20-35
3. Prior to Light or Moderate Snow*	15 to 20	Gal/Lane Mile	20-50

\*Used as bond breaking agent

### **D. WHEN NOT TO ANTI-ICE:**

1. Prior to predicted rain.
2. During heavy snow (1 inch/hour events). Heavy snows will cause the rapid dilution of chemicals and require frequent reapplication of liquid. During this time a snow fighter may need to switch to de-icing methods (may include liquids) for their area.
3. Under blowing or drifting snow conditions.
4. After the bond between in the snow and the pavement has occurred.

## **E. PRECAUTIONS:**

1. Use caution especially with higher rates
2. Refreezing of bridge deck or pavement surfaces can occur if the applied chemical is significantly diluted or pavement temperature decreases. Need to know the lowest working temperature of applied chemical to determine minimum freezing point depression (See Appendix A.)
3. Pavement slipperiness with the use of liquid magnesium chloride and calcium chloride is possible after application under certain temperature and humidity condition.  
(Example: temperature above 30 F and humidity level greater than 40%)
4. When blowing and drifting snow conditions exist. Anti-icing chemicals on a dry pavement or bridge deck may cause blowing snow to stick and create slippery conditions.
5. Corrosion inhibitors that reduce material corrosion to 70% less than sodium chloride are to be used with liquid magnesium and calcium chloride.
6. "Buildup of oils and rubber residues on pavement surfaces and bridge decks may become slippery after the application of liquid anti-icing chemicals. If no significant precipitation has occurred within seven days, assure that these conditions do not exist prior to application."

## **F. BENEFITS OF USING ANTI-ICING:**

1. Accident Reduction.
2. More rapid bare lane regain times.
3. Reduce de-icing material, labor, and de-icer residue.
4. Reduce winter clean-up work and costs.
5. Reduce accumulation of sand in drainage structures and beneath guardrails.

## **H. Nozzles**

1. Eight holes minimum
2. Solid Stream
3. Bar height 12-14 inches

## G. Question And Answer

Q: Does MgCL need to dry to be effective?

A: No, It is still effective when wet.

## References for information on Ant-Icing/De-icing

Pacific Northwest Snowfighters group  
<http://www.wsdot.wa.gov/fossc/maint/pns>

AASHTO “Guide for snow and ice control”, 1999 <http://www.AASHTO.org>

FHWA “Manual of Practice for an Effective Anti-icing Program” Publication No. FHAW A-RD-95-2002,

“Managing Snow and ice Control”- UW Madison Engineering Extension Course.  
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