

I. Purpose:

To provide guidance to field personnel with regard to procedural guidelines in the use of chemicals and abrasives in the snow and ice removal program.

II. Definitions:

- A. Mixture - may be any blend of a deicing chemical and an abrasive except winter abrasives. Actual percentages of each material shall be determined by the Highway Maintenance Supervisor (HMS) or designee as conditions warrant.
- B. Anti-icing - snow and ice control practice which attempts to prevent the formation or development of bonded snow and ice by timely applications of a deicing chemical.
- C. Prewetting - snow and ice control practice of wetting a solid deicing chemical or mixture with a liquid deicer before application to the roadway surface.
- D. Liquid Sodium Chloride - generally a 23 - 24% solution of sodium chloride in water.
- E. Liquid Calcium Chloride - generally a 32% solution of calcium chloride in water.
- F. Liquid Calcium Magnesium Acetate - generally a 25% solution of calcium magnesium acetate in water.
- G. Liquid Potassium Acetate - minimum of 50% potassium plus corrosion inhibitors, by weight used for prewetting at low temperatures.
- H. Deicing - removal of ice or snowpack from roadway using freeze point depressants or mechanical methods.
- I. Deicing Chemical – any chemical freeze point depressant that lowers the freezing point of water.
- J. Winter Abrasive – abrasive that has been treated with salt for use in winter operations.

III. References:

- A. Iowa DOT Standards for Maintenance Activities (Functions 675, 676, 677, 678, 680, 681 and 682)
- B. Office of Maintenance Instructional Memorandum (IM) 8.010, 8.030, and 8.100
- C. Iowa DOT Policies and Procedures Manual (PPM) 010.04 and 010.08

IV. General Guidelines:

- A. The Department will acquire necessary chemicals and abrasive material to assist with removal of snow and ice. The use of these materials should be governed by provisions of this instruction.

V. Procedures:

A. Service Level A-B-C-D

1. Deicing chemicals (liquid, solid or mixture) may be applied in the removal of heavy frost, snow, and ice. Solid deicing chemicals or a mixture should be prewetted for better adhesion and melting. The quantity of dry material should be reduced when prewetted. Refer to the Salt Application Guidelines, attached.
2. Anti-icing may be used prior to and during a winter storm to help prevent the bond of snow and ice to the pavement surface.
3. In general, rock salt (liquid or dry) should not be used with pavement temperature of 15 degrees F and falling. Salt may be applied if pavement temperatures are expected to rise to 15 degrees F or above.
4. Caution should be used when applying liquids to the roadways when winds are expected to exceed 15 mph and loose snow is present.
5. The application rate used must be determined locally and depends upon terrain, traffic, alignment, pavement temperature, type of storm and surface condition. Refer to the Salt Application Guidelines.
6. Calcium chloride in liquid, flake or pellet form may be added to rock salt or mixture. The application rate is 8 gallons of liquid, 38 pounds of flake or 30 pounds of pellets per ton of rock salt or mixture.
7. Recommended application rate for Liquid Sodium Chloride used for prewetting should be approximately 10-20 gallons per ton.
8. Recommended application rate for Liquid Potassium Acetate used for prewetting should be approximately 20 gallons per ton.
9. Recommended application rates for Liquid Sodium Chloride used for frost treatment on bridge decks should be approximately 40 gallons per lane mile.
10. Recommended application rate for Liquid Sodium Chloride used for anti-icing should be a minimum of 50 gallon per lane mile.
11. The decisions whether or not to treat the pavement, what to use, and the quantities to use rest with the HMS or designee based on his/her experience and the apparent road and weather conditions.
12. The termini for snow and ice removal should be predetermined to fall within cities or at intersections where possible. Each District Maintenance Manager (DMM) should set up a system to provide the necessary coordination between crews.
13. Nothing in this section shall preclude the use of straight winter abrasives at locations such as stop signs, railroad crossings, hills, curves and bridges and at other locations as deemed necessary by the HMS or designee.
14. The application of straight deicing chemicals can be used to reduce the accumulation of abrasives in curbs, storm sewers, etc.

B. Service Level E

1. Deicing chemicals, mixtures and abrasives shall be applied as set out in the Iowa DOT Standards for Maintenance Activities or as are set out in agreements negotiated with counties.

Salt Application Guideline*

Salt Application Rate Guidelines							
Prewetted Salt @12' wide lane (assume 2-hour route)							
Roadway Surface Temp- Fahrenheit		32-30	29-27	26-24	23-21	20-18	17-15
Pounds of Salt	Heavy Frost Mist Light Snow	50	75	95	120	140	170
	Drizzle Medium Snow (1/2" per hour)	75	100	120	145	165	200
	Light Rain Heavy Snow (1" per hour)	100	140	182	250	300	350

Prewetted Salt @12' wide lane (assume 3-hour route)							
Roadway Surface Temp- Fahrenheit		32-30	29-27	26-24	23-21	20-18	17-15
Pounds of Salt	Heavy Frost Mist Light Snow	75	115	145	180	210	255
	Drizzle Medium Snow (1/2" per hour)	115	150	180	220	250	300
	Light Rain Heavy Snow (1" per hour)	150	210	275	375	450	525

*- The salt application guidelines are adapted from the Guide for Snow and Ice Control developed for American Association of State Highway Officials.