Standard Test Method: **Corrosion Inhibited Liquid De-icer Chemicals**

1.0 SCOPE

This Standard Specification governs corrosion inhibited liquid de-icer chemicals for:

i. On-board pre-wetting of sand and granular salt in de-icing operations on highways;
ii. Anti-freeze treatment of sand stockpiles.

2.0 MATERIALS SPECIFICATION

The corrosion inhibited liquid de-icer chemicals shall satisfy the requirements in Table 1.

3.0 SAMPLE PRE-APPROVAL

Suppliers are eligible to participate in bidding if the product is an approved product on Manitoba Infrastructure and Transportation's (MIT's) Approved Products List (APL).

If the product is not on MIT's APL, the Supplier must submit two (2) samples of the product in four (4) litre containers, along with chemical, biological and physical analysis of the product satisfying the requirements in Table 1. All analysis tests shall be performed by a qualified laboratory. In addition, the Supplier shall follow MIT's process for new product approval, *MEB S001 Standard Practice for New Product Approval Process.*

4.0 MATERIAL SUPPLY AND DELIVERY

The liquid de-icing material shall be delivered in clean, uncontaminated tanks. The Supplier shall be responsible for necessary equipment to transfer the liquid de-icer into MIT's storage tanks, which will be suitably supplied by MIT.

The material shall be delivered to specified location within 48 hours of notification, excluding Saturdays, Sundays and statutory holidays, unless approved by MIT.

A current and legible MSDS shall accompany each shipment.

5.0 FIELD INSPECTION, SAMPLING AND TESTING

All materials are subject to field inspection, sampling and testing at anytime.

A four litre sample will be taken from each load of product at the time of delivery. Tests

performed will include any or all of the parameters listed in Table 1. The sample of liquid de-icing material will also be tested for mold spores. If at anytime mold spore form during storage, the Supplier shall be responsible for replacing the contaminated material.

If requested by MIT, the Supplier shall provide a copy of the test results performed on a specific load or batch of material.

6.0 REJECTION

At anytime during unloading, materials may be rejected if they are found to be unsatisfactory during field inspection, such as exhibiting excessive flocculation or precipitation. The Supplier shall dispose of any rejected loads, and shall not be paid for the rejected material, delivery or disposal.

7.0 REFERENCE STANDARDS

NACE Standard, TM-0169-95, 1995 revision, as modified by PNS

ASTM D1293, Standard Test Methods for pH of Water

ASTM D1429, Test Methods for Specific Gravity of Water and Brine

Pacific Northwest Snowfighters Snow and Ice Control Chemical Products Specification and Test Protocols, latest edition

Standard Methods for the Examination of Water and Waste Water", APAH-AWWA-WPCF

Approved: *Original signed by:*

Said Kass, P. Eng.
Director, Materials Engineering Branch

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Table 1: Liquid De-icer Specification

	Liquid De-icer Chemical and Physical Properties		
Requirements	Corrosion Inhibited Magnesium Chloride	Organic Corrosion Inhibited De-icer	Test Method[1]
Minimum Concentration of Active Component Percentage (by mass)	25	n/a	PNS[2] Test Method A – Appendix A (Atomic Absorption Spectrophotometry[3])
Harmful Substances Limits (Maximum Allowable Concentration, ppm)			
Arsenic Barium Cadmium Chromium Copper Lead Selenium Zinc	5.0 100.0 0.20 1.0 1.0 1.0 5.0 10.00		Spectrophotometry or Plasma Emission Spectroscopy[3]
Mercury	0.05		Cold Vapor Atomic Spectrophotometry[3]
Phosphorus	2500.0		Total Phosphorous[3]
Cyanide	0.20		Total Cyanide[3]
Corrosion Rate (%)	<30		PNS Test Method B – Appendix A (NACE Standard TM0169-95 as modified by PNS)
Total Settleable Solids (% v/v)	<1.0		PNS Test Method C – Appendix A
Solid Passing #10 Sieve (% v/v)	>99		PNS Test Method C – Appendix A
pH	6-9		PNS Test Method 3 (ASTM D1293 as modified by PNS)
Specific Gravity @ 20°C	>1.2		PNS Test Method 2 (ASTM D1429 – Method A)

NOTES:
1. All references are to the current version.
2. PNS – Pacific Northwest Snowfighters Snow and Ice Chemical Products Specification and Test Protocols.
3. “Standard Methods for the examination Water and Waste Water”, APHA-AWWA-WPCF.