
DMS-6400

De-Icer/Anti-Icer

Effective Date: June 2016



1. DESCRIPTION

This Specification governs the Quality Monitoring Program (QMP) for safe de-icer/anti-icer, pre-qualification requests and procedures, disqualification, sampling, re-qualification, quality control (QC), and material requirements.

2. UNITS OF MEASUREMENTS

The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

3. MATERIAL PRODUCER LIST

The Materials and Pavements Section of the Construction Division (CST/M&P) maintains the Material Producer List (MPL) of all materials conforming to the requirements of this Specification. Materials appearing on the MPL, entitled "[De-Icer/Anti-Icer](#)," require no further sampling and testing before use, unless deemed necessary by the Project Engineer or CST/M&P. To obtain a place on this list, the product must be accepted into the QMP. Materials not on the list require project-specific testing.

4. BIDDERS' AND SUPPLIERS' REQUIREMENTS

The Department will purchase or allow on projects those products listed by producer and product code or designation shown on the MPL. **Products not included on the MPL that are certified by the Contractor to meet this Specification can be purchased but must be tested and approved by the Department before use. Allow 30 calendar days for the Department to sample, test, and report results for products not included on the MPL.**

Use of pre-qualified product does not relieve the Contractor of the responsibility to provide product that meets this Specification. The Department may inspect or test material at any time and reject any material that does not meet the specifications.

5. PRE-QUALIFICATION PROCEDURE

5.1. **Pre-Qualification Request.** Submit a request for evaluation under DMS-6400 to DMS_Prequal@txdot.gov.

Include the following information in the request:

- company name;
- physical and mailing addresses;
- contact person, phone number, and email address;
- type of material;
- laboratory test report with test data showing compliance of the material with the requirements stated in this Specification; and
- most recent detailed product specification sheet and Safety Data Sheet (SDS) that complies with OSHA Hazard Communication Standard 29 CFR 1910.1200, including the SDS of the inhibitor.

All documents must be clearly legible.

- 5.2. **Pre-Qualification Sample.** After reviewing the request for QMP pre-qualification, CST/M&P will request a minimum of one sample (at least 1 gal.) for each de-icer being considered for pre-qualification. Ship pre-qualification sample(s) with current SDS to the Texas Department of Transportation, CST/M&P (CP51), 9500 North Lake Creek Parkway, Austin, TX 78717.

Submit all materials for pre-qualification at no cost to the Department.

- 5.3. **Evaluation.** CST/M&P will notify prospective bidders and suppliers after completion of material evaluation.

- 5.3.1. **Qualification.** If approved for Department use, CST/M&P will add the material to the MPL.

Report changes in the composition or in the manufacturing process of any material to CST/M&P. Significant changes reported by the producer, as determined by the Director of CST/M&P, may require a re-evaluation of performance. The Department reserves the right to conduct whatever tests it deems necessary to identify a pre-qualified material and determine if there is a change in the composition, manufacturing process, or quality that may affect its durability or performance. In case of variance, the Department's tests will govern.

- 5.3.2. **Failure.** Producers not qualified under this Specification may not furnish materials for use on Department projects.

Producers failing to qualify may submit a request for re-evaluation after 1 month has elapsed from the date of the original request. CST/M&P may modify this time limit at its discretion. In the request for re-evaluation, document the cause of the issue and corrective action taken.

The Department normally bears the costs of sampling and testing; however, the producer will bear the costs associated with materials failing to conform to the requirements of this Specification. The Director of CST/M&P will assess this cost at the time of testing, and amounts due will be billed to the producer.

- 5.4. **Quality Monitoring Requirements.** Materials in the QMP are pre-qualified every year. The pre-qualification period is from July 1 to June 30. During each pre-qualification period, the producer must provide a quality monitoring (QM) sample and monthly quality control (QC) testing reports.

- 5.4.1. **QM Sample.** The producer must submit a sample of each pre-qualified material every pre-qualification period to CST/M&P for testing. To allow sufficient time for testing, submit sample at least one month before the beginning of the pre-qualification period. Any material not submitted on time may be delayed in posting on the MPL.

- 5.4.2. **QC Testing Reports.** The Department requires that all producers in the QMP perform QC testing on their material. Testing is required for every material that is pre-qualified under the QMP.

Submit QC testing reports to CST/M&P twice per pre-qualification period. The report must reflect the test data from each batch of pre-qualified de-icer regardless of the destination of the material. The monthly report must contain the following information:

- type of de-icer,
- date of manufacture,
- batch number, and
- QM test results.

Producers should submit reports by the first business day of the months of October and January. If there was no pre-qualified material produced for a particular month, the producer must submit a report stating there was no production of the material.

- 5.5. **Periodic Evaluation.** The Department reserves the right to conduct random sampling and testing of pre-qualified materials to verify performance and Specification compliance, to perform random audits of documentation, and to inspect and approve the QC testing laboratory to ensure that all equipment and test procedures meet the applicable criteria. Department representatives may sample material from manufacturing plants or the project site. Producers should maintain a complete record of all test reports for the previous and current calendar year.

Failure of materials to comply with the requirements of this Specification as a result of periodic evaluation may be cause for removal of those materials from the MPL. In case of variance, the Department's tests will govern.

- 5.6. **Disqualification.** Causes for disqualification and removal from the MPL and QMP may include, but are not limited to:

- falsification of documentation,
- producer fails to report any change in material composition or manufacturing process to CST/M&P,
- producer fails to properly submit complete QC testing reports or QM samples to CST/M&P;
- material fails to meet the requirements of this Specification as a result of periodic evaluation, or
- producer has unpaid charges for failing samples.

Disqualification will only apply to the de-icer type corresponding to the infraction.

CST/M&P will remove disqualified producers from the MPL and will not allow submission of material for re-qualification for 6 months, or at the discretion of the Department.

- 5.7. **Re-Qualification.** Once the disqualification period established by CST/M&P has elapsed, producers disqualified and removed from the MPL may begin the re-qualification process by submitting a request in accordance with Section 5.1, including a test report with data certifying that the de-icer meets the material requirements of this Specification and additional documentation identifying the cause of the problem and corrective action taken. The re-qualification process will then follow all subsequent Sections of Article 5.

The Department normally bears the costs of sampling and testing; however, the disqualified producer will bear the costs associated with re-qualification. The Director of CST/M&P will assess this cost at the time of re-evaluation, and amounts due will be billed to the producer.

6. MATERIAL REQUIREMENTS

6.1. Anti-Icer (Chloride Based).

- 6.1.1. **General Requirements.** The chloride-based anti-icer with corrosion-inhibiting material must be active at an ambient temperature of -15°C (5°F) or lower. If active at this temperature, the de-icer/anti-icer will melt ice on roadways and bridges. The solid chloride-based product must be in a free-flowing, usable condition when received.

Unless otherwise noted, the Department will allow appropriate industry-accepted methods of wet titration and instrumental testing.

6.1.2. **Chemical Requirements.**

**Table 1
Chemical Requirements**

Property	Requirement
Magnesium chloride concentration for liquid products	26–30%
Solid chloride-based product (mixture of calcium, magnesium, potassium, and sodium chloride), total % of the salts	92%
Total phosphates, "Standard Methods for the Examination of Water and Waste Water," APHA-AWWA-WPCF	2,500 ppm Max
Cyanide	0.20 ppm Max
Chromium	0.5 ppm Max
Cadmium	0.15 ppm Max
Sulfate	0.7 Max

6.1.3. **Physical Requirements.**

**Table 2
Physical Requirements**

Property	Requirement
pH, ASTM E 70–90 ¹	6–9
Specific gravity	1.24–1.28 (Liquids)
Particle size, ASTM C 136 ² , (% by weight) retained on sieve size <ul style="list-style-type: none"> • 0.75 in. (19 mm) • 0.25 in. (6.3 mm) • No. 8 (2.36 mm) 	<ul style="list-style-type: none"> • 0 • 30 Max • 70 Max
Corrosive property, Tex-624-J	70% less corrosive than NaCl
Frictional analysis, per PNS specification	0.3 Min
Settleable solids and solidification, Tex-625-J	1% Max

1. Except a dilution must be made of 1 part de-icer to 4 parts distilled/de-ionized water before reading
2. Sample must not be moistened, as directed ASTM C 136, Section 4.1.

6.2. **Sodium Chloride (De-Icing Salt).**

6.2.1. **General Requirements.** The sodium chloride may be obtained from either natural deposits (rock salt) or produced artificially (evaporated, solar, or other salt). The material must be in a free-flowing, usable condition when received. There are two types: Type I is rock salt for broadcasting, and Type II is a finer gradation for making brine.

The material supplied must not have constituents that would cause residual waste to meet the definition of a hazardous waste, as found in 40 CFR 261.

6.2.2. **Chemical Requirements.**

**Table 3
Chemical Requirements**

Property	Requirement
Chlorides, as NaCl, (% by weight), ASTM D 632 ¹ , Paragraph A1	94.5 Min
Sulfate, %	0.7 Max

1. Grind at least a 20-g portion of the reduced sample to pass a No. 50 (300 mm) standard sieve. Use 2 mL (0.068 fl. oz.) potassium chromate instead of 3 mL (0.10 fl. oz.)

6.2.3. **Physical Requirements.**

**Table 4
Physical Requirements**

Particle size, ASTM C 1361, (% by weight) retained on sieve size	Requirement	
	Type I	Type II
0.2665 in. (6.7mm)	20 Max	--
No. 8 (2.36 mm)	50-95	--
No. 4 (4.76 mm)	--	0
No. 30 (600 µm)	90 Min	--
No. 100 (149 µm)	--	97-100

1. Sample must not be moistened as directed in ASTM C 136, Section 4.1.

7. DELIVERY AND EQUIPMENT

The vendor is responsible for assuring delivery and complete transfer of the material through properly calibrated metered pumps for liquids or certified scales for solids and for all necessary equipment to transfer the material to existing storage facilities.

The product, including corrosion inhibitor, must be completed at the original manufacturing plant location. Post-adding of corrosion inhibitors or any other ingredients and splash mixing is not allowed.

8. PACKAGING AND LABELING

Package material as stated in the invitation to bid. Packaging must protect material from moisture under normal storage conditions and must permit safe dispensing under a variety of storage and weather conditions.

A bill of lading with the following information must accompany each shipment:

- product name, supplier, producer, and destination;
- total weight of delivery (certified scale ticket);
- lot number of products being delivered (number must enable purchaser to track a delivered product back to its manufacture point, date of manufacture, and specific batch); and
- shipper information, including the name of the shipping company; tank, trailer, or rail car number; and point and date of origin.

Upon delivery of a purchased shipment to the Department, include the following documentation:

- current, clearly legible Safety Data Sheet (SDS);
- clear documentation of material percent concentration of magnesium chloride;
- application rate table that clearly states the producer-/vendor-/supplier-recommended rate for the various conditions of use at the place of delivery;
- shipper information, including the name of the shipping company; tank, trailer, or rail car number; and point and date of origin;
- shelf life of material;
- friction analysis report on all products (Any certified lab that is set up to run the test as a function of humidity and for the type of roadway [asphalt or concrete] specified may perform the test. Required information includes hard data, graphical analysis, and a write-up about the product, typically with comparison information.);
- information on how low temperatures will affect storage of liquid material;
- clear documentation on proper storage; and

- certification that any chloride-based anti-icer supplied meets test methods SHRP-H-205.2 for effectiveness (*Strategic Highway Research Program Handbook of De-Icer Test Methods*).

9. ARCHIVED VERSIONS

Archived versions are available.