Special Specification 8032
Winter Weather Materials (Materials Only)

1. DESCRIPTION

Furnish materials commonly used for pre-treating (anti-icing) before treating (de-icing) highways during winter weather events.

2. MATERIALS

2.1. **Material Producer List (MPL).** The Materials and Tests Division (MTD) maintains an MPL for some of the materials shown in this Specification. Materials appearing on the MPL, entitled "De-Icer/Anti-Icer," require no further testing unless deemed necessary by the Engineer. Use of pre-qualified product does not relieve the Contractor of the responsibility to provide product that meets this Specification. To have a product tested for consideration on the MPL, submit a request for evaluation under DMS-6400 to DMS_Prequal@txdot.gov.

2.2. **Type I Road Salt.**

2.2.1. **General Requirements**. Type I road salt is composed of sodium chloride obtained from natural deposits (rock salt). The material must be in a free-flowing, usable condition when received. Pre-qualified Type I road salt products are shown on the MPL under category 'Pre-Qualified Producers of Sodium Chloride De-Icer/Anti-Icer' and listed as Type I.

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.

2.2.2. **Chemical Requirements.** Provide sodium chloride materials meeting the requirements in accordance with Table 1.

Table1
Type I Road Salt 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.)

2.2.3. **Physical Requirements.** Provide sodium chloride materials meeting the requirements in accordance with Table 2.

Table 2
Type I Road Salt Physical Requirements

Property	Requirement
Particle size, ASTM C 136[1], (% by weight) retained on sieve size	Type I
0.2665 in. (6.7mm)	20 Max
No. 8 (2.36 mm)	50-95
No. 30 (600 µm)	90 Min
Insoluble Particles, ASTM E534, %	N/A

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

2.3. **Type II Brine Salt.**

2.3.1. **General Requirements.** Type II brine salt is composed of sodium chloride obtained from natural deposits (rock salt) or produced artificially (evaporated, solar, or other salt). The material must be in a free-flowing, usable condition when received. Pre-qualified Type II brine salt products are shown on the MPL under category 'Pre-Qualified Producers of Sodium Chloride De-Icer/Anti-Icer' and listed as Type II.

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.

2.3.2. **Chemical Requirements.** Provide sodium chloride materials meeting the requirements in accordance with Table 3.

Table 3
Type II Brine Salt 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.)

2.3.3. **Physical Requirements.** Provide sodium chloride materials meeting the requirements in accordance with Table 4.

Table 4
Type II Brine Salt Physical Requirements

Property	Requirement
Particle size, ASTM C 136[1], (% by weight) retained on sieve size	Type II
0.2665 in. (6.7mm)	20 Max
No. 8 (2.36 mm)	50-95
No. 30 (600 µm)	90 Min
Insoluble Particles, ASTM E534, %	<0.5

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

2.4. **Complex Chloride.**

2.4.1. **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. Complex chlorides include mixtures of solid salts, but liquid solutions must not be provided. Pre-qualified complex chloride products are shown on the MPL under category 'Pre-Qualified Producers of De-Icer/Anti-Icer'.

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

2.4.2. **Chemical Requirements.** Provide complex chloride materials meeting the requirements in accordance with Table 5. Sand or aggregate may be mixed in with the chlorides listed in accordance with Table 5.

Table 5
Complex Chloride Chemical Requirements

Property	Requirements
Complex chloride (mixture of calcium, magnesium, potassium, and sodium chloride), total % by weight of the salts	92% Min
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

2.4.3. **Physical Requirements.** Provide complex chloride materials meeting the requirements in accordance with Table 6.

Table 6
Complex Chloride Physical Requirements

Property	Requirements
pH, ASTM E 70-90[1]	6-9
Particle size, ASTM C 136[2], (% by weight) retained on sieve size:	NA
0.75 in (19mm)	0%
0.25 in (3.6mm)	30% Max
No. 8 (2.36 mm)	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 one part de-icer to four parts distilled/de-ionized water before reading.
2. Sample must not be moistened, as directed ASTM C 136, Section 4.1.

2.5. **Brine Solution.** Provide a pre-mixed solution of Type II brine salt and water containing 23.3% by weight of Type II brine salt with a solution pH between five and nine. Ensure a uniform solution with all Type II brine salt fully dissolved.

2.6. **Fracking Brine Solution.** Provide a pre-mixed solution of Type II brine salt and water containing 26% by weight of Type II brine salt with a solution pH between five and nine. Ensure a uniform solution with all Type II brine salt fully dissolved. Other percentages by weight of Type II brine salt may be acceptable if shown on the plans or provided in writing by the Engineer. The Department will dilute fracking brine to a solution containing 23.3% by weight of brine salt.

2.7. **Type 5 Modified Aggregate.** Provide aggregate conforming to the gradation requirements shown in accordance with Table 7 when tested in accordance with Tex-401-A unless otherwise specified.

Table 7
Type 5 Modified Aggregate Gradation Chart

Sieve Size	Percent Passing
3/8”	100
#4	86-94
#8	45-65
#16	25-46
#30	15-35
#50	10-25
#100	7-18
#200	0-5

2.8. **Type L Aggregate.** Provide lightweight aggregate consisting of expanded shale, clay, or slate, and produced by the rotary kiln method.

Provide aggregate conforming to the gradation requirements shown in Table 8 when tested in accordance with Tex-401-A unless otherwise specified.

Table 8
Type L Aggregate Gradation Chart

Sieve Size	Percent Passing
3/8”	100
#4	86-94
#8	45-65
#16	25-46
#30	15-35
#50	10-25
#100	7-18
#200	0-5

2.9. **Sand.** Provide fine aggregate consisting of clean, hard, durable particles of natural, manufactured sand, recycled crushed hydraulic cement concrete, slag, lightweight aggregate, or a combination thereof.

Provide fine aggregate or combinations of aggregates conforming to the gradation requirements shown in Table 9 when tested in accordance with Tex-401-A unless otherwise specified.

Table 9
Sand Gradation Chart

Sieve Size	Percent Passing
3/8”	100
#4	95-100
#8	80-100
#16	50-85
#30	25-65
#50	10-35[1]
#100	0-10
#200	03-3[2]

1. 6–35 when sand equivalent value is greater than 85.
2. 0–6 for manufactured sand.

3. MEASUREMENT

3.1. **Type I Road Salt**. This Item will be measured by the ton, cubic yard, or bag size of dry material as defined in the plans and specifications.

3.2. **Type II Brine Salt**. This Item will be measured by the ton, cubic yard, or bag size of dry material as defined in the plans and specifications.

3.3. **Complex Chloride**. This Item will be measured by the ton, cubic yard, or bag size of dry material as defined in the plans and specifications.

3.4. **Brine Solution**. This Item will be measured by the gallon.

3.5. **Fracking Brine Solution**. This Item will be measured by the gallon.

3.6. **Type 5 Modified Aggregate**. This Item will be measured by the ton or cubic yard of dry material as defined in the plans and specifications.

3.7. **Type L Aggregate**. This Item will be measured by the ton or cubic yard of dry material as defined in the plans and specifications.

3.8. **Sand**. This Item will be measured by the ton or cubic yard of dry material as defined in the plans and specifications.

4. PAYMENT

4.1. **Material (Pick up).** Payment will be made at the unit prices bid for each item. This price is full compensation for furnishing materials, assistance provided in sampling, loading provided vehicles, furnishing scales and labor for weighing and measuring, and equipment, labor, tools, and incidentals.

4.2. **Material (Delivery).** Payment will be made at the unit prices bid for each item. This price is full compensation for furnishing materials, loading, hauling, delivery of materials, furnishing scales and labor for weighing and measuring, providing pumps and hoses for transferring liquid brine solution to a storage tank, and equipment, labor, tools, and incidentals. Delivery locations will be as shown on the plans.