



Designation: ~~D632~~—~~12~~ **D632 – 12 (Reapproved 2020)**

Standard Specification for Sodium Chloride¹

This standard is issued under the fixed designation D632; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

- 1.1 This specification covers sodium chloride intended for use as a deicer and for road construction or maintenance purposes.
- 1.2 The values stated as SI units are to be regarded as the standard.
- 1.3 For purposes of determining conformance to this specification, values for chemical analysis shall be rounded to the nearest 0.1 %, and values for grading shall be rounded to the nearest 1 %, in accordance with the rounding method in Practice **E29**.
- 1.4 The text of this specification references notes and footnotes that provide explanatory material. These notes and footnotes shall not be considered as requirements of the specification.
- 1.5 The following precautionary caveat pertains only to the test method in **Annex A1**; of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate ~~safety~~ safety, health, and ~~health~~ environmental practices and determine the applicability of regulatory limitations prior to use.*
- 1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- ~~C136~~**C136/C136M** Test Method for Sieve Analysis of Fine and Coarse Aggregates
- C670** Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
- E11** Specification for Woven Wire Test Sieve Cloth and Test Sieves
- E29** Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
- E287** Specification for Laboratory Glass Graduated Burets
- E288** Specification for Laboratory Glass Volumetric Flasks
- E534** Test Methods for Chemical Analysis of Sodium Chloride

¹ This specification is under the jurisdiction of ASTM Committee **D04** on Road and Paving Materials and is the direct responsibility of Subcommittee **D04.31** on Calcium and Sodium Chlorides and Other Deicing Materials.

Current edition approved April 1, 2012; Nov. 1, 2020. Published April 2012; November 2020. Originally approved in 1941. Last previous edition approved in 2004 as ~~D632—04~~**D632 – 12**, which was withdrawn in January 2010 and reinstated in April 2012. DOI: 10.1520/D0632-12; DOI: 10.1520/D0632-12R20.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3. Classification

3.1 This specification covers sodium chloride obtained from natural deposits (rock salt) or produced by man (evaporated, solar, other) and recognizes two types and two grades as follows:

3.1.1 *Type I*—Used primarily as a pavement deicer or in aggregate stabilization.

3.1.1.1 *Grade 1*—Standard grading (**Note 1**).

3.1.1.2 *Grade 2*—Special grading (**Note 1**).

3.1.2 *Type II*—Used in aggregate stabilization or for purposes other than deicing.

NOTE 1—Grade 1 provides a particle grading for general application, and has been found by latest research to be most effective for ice control and skid resistance under most conditions. Grade 2 is the grading typical of salt produced in the ~~Western~~western United States and is available in states of the Rocky Mountains ~~Region~~region and west, which may be preferred by purchasers in that area.

4. Chemical Requirements

4.1 The sodium chloride shall conform to the following requirement for chemical composition, except for the tolerance stated in **6.1** and **6.2**:

Sodium chloride (NaCl), min, %	95.0
--------------------------------	------

5. Physical Requirements

5.1 *Grading*:

5.1.1 *Type I*—The grading of Type I sodium chloride, when tested by means of laboratory sieves conforming to Specification **E11**~~E11~~₂, shall conform to the following requirements for particle size distribution, except for the tolerance stated in **6.1** and **6.1.1**:

Sieve Size	Mass % Passing	
	Grade 1	Grade 2
19.0 mm (¾ in.)	...	100
12.5 mm (½ in.)	100	...
9.5 mm (⅜ in.)	95 to 100	...
4.75 mm (No. 4)	20 to 90	20 to 100
2.36 mm (No. 8)	10 to 60	10 to 60
600 μm (No. 30)	0 to 15	0 to 15
600 μm (No. 30)	0 to 15	0 to 15

5.1.2 *Type II*—The grading of Type II sodium chloride shall conform to the grading requirements imposed or permitted by the purchaser under conditions of the intended use.

6. Permissible Variations

6.1 In the case of sodium chloride sampled after delivery to the purchaser, tolerances from the foregoing specified values shall be allowed as follows:

6.1.1 *Grading*—~~Five~~Five percentage points on the maximum value for the range for each sieve size, except the 12.5 mm (½ in.) ~~in.~~ and 9.5 mm (⅜ in.) for Grade 1 and 19.0 mm (¾ in.) for Grade 2.

6.1.2 *Chemical Composition*—0.5 percentage point.

7. Condition

7.1 The sodium chloride shall arrive at the purchaser's delivery point in a free-flowing and usable condition.

8. Sampling

8.1 Not less than three sample increments shall be selected at random from the lot (**Note 2**). Each increment shall be obtained by scraping aside the top layer of material to a depth of at least 25 mm (1 in.) and taking a 500-g (approximately 1-lb) quantity of sodium chloride to a depth of at least 150 mm (6 in.). Sampling shall be done by means of a sampling thief or other method that will ensure a representative cross section of the material. The sample increments shall be thoroughly mixed to constitute a composite sample representative of the lot.

NOTE 2—A lot may be an amount agreed upon between purchaser and supplier at the time of purchase.

9. Test Methods

9.1 *Chemical Analysis*—Test for compliance with the requirements for chemical composition in accordance with the following methods:

9.1.1 *Routine Control*—Use of the “Rapid Method” in **Annex A1** is permitted for routine control and approval.

9.1.2 *Referee Testing*—In case of controversy, determine the chemical composition of the ~~sample~~, sample using the current version of Test Method **E534**.

9.2 Grading shall be determined by Test Method ~~E136~~ **C136/C136M**.

10. Inspection

10.1 The purchaser or his representative shall be provided free entry and necessary facilities at the production plant or storage area if he elects to sample sodium chloride at the source.

11. Rejection and Rehearing

11.1 The sodium chloride shall be subject to rejection if it fails to conform to any of the requirements of this specification.

11.2 In the case of failure to meet the requirements on the basis of an initial sample of a lot represented, two additional samples shall be taken from the lot and tested. If both additional samples meet the requirements, the lot shall be accepted.

12. Packaging and Marking

12.1 The sodium chloride shall be delivered in bags or other containers acceptable to the purchaser, or in bulk lots. The name of the producer and the net weight shall be legibly marked on each bag or container, or in the case of bulk lots, on the shipping or delivery report.

13. Keywords

13.1 salt; snow and ice removal; sodium chloride; stabilization; winter maintenance

A1. RAPID METHOD OF ANALYSIS FOR SODIUM CHLORIDE

A1.1. Scope

A1.1.1 This annex covers a rapid method for chemical analysis of sodium chloride.

A1.1.2 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

A1.2. Significance and Use

A1.2.1 The procedure for chemical analysis in this annex determines the total amount of chlorides present in the sample and expresses that value as sodium chloride.

A1.2.2 This rapid method of analysis does not distinguish between sodium chloride and other evaporite chloride compounds with ice-melting capabilities. Typical rock salt and solar salt sometimes contains small amounts of CaCl_2 , MgCl_2 , and KCl , depending on the source of the material. When this rapid method is used on continuing shipments from a known source, it will provide a fast, essentially accurate determination of the sodium chloride content of the material furnished. Thus, the need for testing by the referee method, Test Method [E534](#), is reduced.

A1.3. Apparatus

[ASTM D632-12\(2020\)](#)

A1.3.1 *Glassware*—Standard weighing bottles, volumetric flasks (conforming to Specification [E288](#), Class C or better), and burets (conforming to Specification [E287](#), Class B or better).

A1.3.2 *Balance*, having a capacity of at least 20 g, accurate and readable to 0.01 g.

A1.4. Reagents

A1.4.1 *Nitric Acid (HNO_3)*, dilute (HNO_3 : H_2O , 1:4 by volume).

A1.4.2 *Calcium Carbonate (CaCO_3)*—Reagent ~~grade~~ low-grade, low chloride, powder.

A1.4.3 *Silver Nitrate Solution*—0.05 N AgNO_3 .

A1.4.4 *Sodium Chloride (NaCl)*—Reagent grade.

A1.4.5 *Potassium Chromate (K_2CrO_4) Solution*—(50 g K_2CrO_4 /L).