ANSI/AWWA B200-12
(Revision of ANSI/AWWA B200-07)

American Water Works Association

The Authoritative Resource on Safe Water®

AWWA Standard

Sodium Chloride

STANDARD
Since 1881

Approved American National Standard
ANSI

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AWWA Standard

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Contents

All AWWA standards follow the general format indicated subsequently. Some variations from this format may be found in a particular standard.

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA B200.*

I. Introduction.

I.A. *Background.* Bedded salt† deposits are the remains of ancient seas that have evaporated. Bedded deposits occur in horizontal layers of the mineral halite. These layers range from several to hundreds of feet (meters) in thickness and are between several and several thousand feet (meters) below the surface of the earth. Some bedded deposits between 25,000 ft and 50,000 ft (7,600 m and 15,200 m) below the surface of the earth have been subjected to pressures that have caused the salt to move upward through overlying sedimentary layers toward the Earth's surface. Presently, these deposits exist as domes of nearly pure salt that may be as large as 2 mi (3.2 km) in diameter and are sometimes found within a few feet of the Earth's surface.

Concentrated brine† is found in surface lakes or underground pools. Along seacoasts, the oceans provide a virtually unlimited source of salt.

Rock salt is produced by the conventional room-and-pillar mining method. After sinking a shaft to the salt level, the face, or vertical area, is drilled and may be undercut. The drill holes are loaded with explosives, and the explosives are detonated. The fragmented salt that results is crushed, screened, transported to the shaft, and hoisted to the surface.

Solar salt is produced by the natural evaporation of seawater or more concentrated brine from surface lakes or underground formations in shallow ponds.

Solution-mined brine, from which evaporated salt is produced, is obtained by drilling wells into bedded or domal rock-salt deposits and injecting water into the deposit. The water dissolves the rock salt to produce a saturated brine. Salt deposits can be solution-mined through a single set of concentric pipes or through two or more separate pipes within the same deposit. The brine can then be evaporated to produce dry salt by vacuum-pan evaporation or modifications of vacuum-pan evaporation, grainer evaporation, or the Alberger process.

In vacuum-pan evaporation, cubic "vacuum-granulated" salt crystals form in the brine during evaporation and are removed as a slurry, which is then dewatered and dried.

* American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.

† The terms salt and brine are used to describe the chemical compound sodium chloride (NaCl).

In the grainer process, small hoppers of salt form on the surface of a concentrated brine solution. These drop to the bottom of the grainer pan once they become large enough to overcome forces that hold them to the surface. The resultant flake salt is removed from the grainer by rakes and dried in a rotary dryer.

The Alberger process is a part vacuum-pan, part grainer operation in which cubic crystals are formed in a flash chamber and fed to the grainer pans. The seed crystals in the grainer pan produce a product that is a mixture of grainer-type flakes and flakes grown on seed crystals. The salt is centrifuged from the brine and dried as in the grainer process. Screens are used to separate the salt into specific grades.

Any of the three types of salt (rock, solar, or vacuum-granulated and their compressed forms) can be used for regeneration of ion-exchange resins. The greater quantity of insoluble matter in some rock salt may require clarification of the brine. The accumulation of insolubles in the brine tank is a disadvantage, because periodic removal is necessary. Vacuum-granulated salt has the highest purity and leaves no insoluble residue.

Salt for regeneration of ion-exchange units should be selected on the basis of the brine purity required. Cation-exchange processes usually require that the saturated brine contain less than 2,000 mg/L of calcium sulfate ($CaSO_4$). Anion-exchange processes require brine with low calcium and magnesium (Mg) content to produce a consistent quality of effluent water. When caustic soda or soda ash is added to the brine makeup, saturated brine with a calcium level of 0 to 10 mg/L (as Ca) should be used. The magnesium level should be 0 to 2 mg/L (as Mg).

I.B. *History.* The first edition of the AWWA standard for sodium chloride was approved as tentative by the AWWA Board of Directors on July 6, 1949. ANSI/AWWA B200 was made a standard on May 15, 1953. Revisions approved on June 5, 1964, provided new sections on information to be supplied by the purchaser and on an affidavit of compliance. The revisions also provided for the use of the ethylenediaminetetraacetic acid (EDTA) titrimetric method for determining calcium and magnesium, the permanganate titrimetric method for calcium, and the gravimetric method for magnesium.

The 1969 revisions of the standard provided for two types of salt that were not included in earlier standards: evaporated and compressed evaporated salt. At that time, the impurity limits for certain constituents were revised, the definitions section was revised and enlarged, the physical characteristics were modified regarding fineness requirements, and minor changes were made in the test methods. The 1978 edition combined evaporated salt and compressed evaporated salt and added a specification for compressed solar salt. The 1988 edition included an acceptance clause in the foreword and revised definitions, limits, and test procedures. The 1993 edition included a revised acceptance statement and definitions. The 1998 edition of ANSI/AWWA B200 was revised to conform to AWWA standard style. The ninth edition of ANSI/AWWA B200 was approved by the AWWA Board of Directors on June 11, 2006. This edition was approved on Jan. 22, 2012.

I.C. *Acceptance.* In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with a consortium led by NSF International (NSF) to develop voluntary third-party consensus standards and a certification program for direct and indirect drinking water additives. Other members of the original consortium included the American Water Works Association Research Foundation (AwwaRF, now Water Research Foundation*) and the Conference of State Health and Environmental Managers (COSHEM). The American Water Works Association and the Association of State Drinking Water Administrators (ASDWA) joined later.

In the United States, authority to regulate products for use in, or in contact with, drinking water rests with individual states.† Local agencies may choose to impose requirements more stringent than those required by the state. To evaluate the health effects of products and drinking water additives from such products, state and local agencies may use various references, including two standards developed under the direction of NSF, NSF‡/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 61, Drinking Water System Components—Health Effects.

Various certification organizations may be involved in certifying products in accordance with NSF/ANSI 60. Individual states or local agencies have authority to accept or accredit certification organizations within their jurisdiction. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Annex A, "Toxicology Review and Evaluation Procedures," to NSF/ANSI 60 does not stipulate a maximum allowable level (MAL) of a contaminant for substances not regulated by a USEPA final maximum contaminant level (MCL). The MALs of an unspecified list of "unregulated contaminants" are based on toxicity testing guidelines (noncarcinogens) and risk characterization methodology (carcinogens). Use of Annex A procedures may not always be identical, depending on the certifier.

* Water Research Foundation, 6666 West Quincy Avenue, Denver, CO 80235.
† Persons outside the United States should contact the appropriate authority having jurisdiction.
‡ NSF International, 789 N. Dixboro Road, Ann Arbor, MI 48113.

ANSI/AWWA B200 addresses additives requirements in Sec. 4.3 of the standard. The transfer of contaminants from chemicals to processed water or to residual solids is becoming a problem of great concern. The language in Sec. 4.3.4 is a recommendation only for direct additives used in the treatment of potable water to be certified by an accredited certification organization in accordance with NSF/ANSI 60 Drinking Water Treatment Chemicals—Health Effects. However, users of the standard may opt to make this certification a requirement for the product. Users of this standard should consult the appropriate state or local agency having jurisdiction in order to

1. Determine additives requirements, including applicable standards.
2. Determine the status of certifications by all parties offering to certify products for contact with, or treatment of, drinking water.
3. Determine current information on product certification.

II. Special Issues. Currently, there are no special issues related to this standard.

III. Use of This Standard. It is the responsibility of the user of an AWWA standard to determine that the products described in that standard are suitable for use in the particular application being considered.

III.A. *Purchaser Options and Alternatives.* The following information should be provided by the purchaser:

1. Standard used—that is, ANSI/AWWA B200, Sodium Chloride, of latest revision.
2. Whether compliance with NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, is required.
3. When rock salt is readily available with values for moisture, calcium, magnesium, sulfates, or water-insoluble impurities lower than those shown in Table 1 of the standard, purchasers may prefer to modify the limits set in the table for these substances (Sec. 4.3.2).
4. Details of other federal, state or provincial, and local, requirements (Sec. 4.3.3 and Sec. 6.2).
5. Whether the purchaser will reject product from containers or packaging with missing or damaged seals. The purchaser may reject product from bulk containers or packages with missing or damaged seals unless the purchaser's tests of representative samples, conducted in accordance with Sec. 5.3, demonstrate that the product meets the standard. Failure to meet the standard or the absence of, or irregularities in, seals may be sufficient cause to reject a shipment.

6. Quantity of sodium chloride required and method of packaging and shipping (Sec. 6.2).

7. Whether bulk shipments of sodium chloride are accompanied by weight certificates of certified weighers (Sec. 6.2.4).

8. Whether alternative security measures have been adopted to replace or augment the security measures set out in Sec. 6.2.5 and 6.2.6.

9. An affidavit of compliance or certified analysis, or both, if required (Sec. 6.3).

III.B. *Modification to Standard.* Any modification to the provisions, definitions, or terminology in this standard must be provided by the purchaser.

IV. Major Revisions. Major changes made to the standard in this revision include the following:

1. Expanded scope to include wastewater and reclaimed water when applicable, Sec. 1.1 and Sec. 1.3.

2. Added the definitions for potable water, wastewater, and reclaimed water in Section 3.

3. Included a requirement for certification in accordance with NSF/ANSI 60 when product is used in the treatment of potable water (Sec. 4.3.4).

4. Replaced the reagent trichlorotrifluoroethane with n-hexane since it was removed from Method 5520 in the latest edition of *Standard Methods for the Examination of Water and Wastewater** due to environmental concerns (Sec. 5.9).

5. Sec. 6.1, Marking was revised to include a requirement to conform to application laws and regulations, including OSHA.

6. A requirement for tamper-evident packaging was added in Sec. 6.2.5 and Sec. 6.2.6. A definition for tamper-evident packaging was added to Section 3.

7. Sec. 6.3, Affidavit of compliance was revised to include a second option for compliance.

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Services at 303.794.7711, FAX at 303.795.7603, write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098, or e-mail at standards@awwa.org.

* *Standard Methods for the Examination of Water and Wastewater*, 22nd edition. APHA, AWWA, WEF. 2012. Washington, D.C.

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ANSI/AWWA CB200-12
(Revision of ANSI/AWWA B200-07)

American Water Works Association

AWWA Standard

Sodium Chloride

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes sodium chloride in the forms of rock, vacuum-granulated, compressed vacuum-granulated, solar, and compressed solar salt for use in the recharging of cation-exchange materials in water supply service for softening municipal and industrial potable water, wastewater, and reclaimed water supplies. Additionally, sodium chloride is used in the recharging of anion-exchange materials for nitrate removal or de-alkalization of municipal and industrial supplies.

Sec. 1.2 Purpose

The purpose of this standard is to provide the minimum requirements for sodium chloride, including physical, chemical, sampling, packaging, shipping, and testing requirements.

Sec. 1.3 Application

This standard can be referenced in the purchaser's documents for purchasing and receiving sodium chloride and can be used as a guide for testing the physical and chemical properties of sodium chloride samples. The stipulations of this standard apply when this document has been referenced and then only to sodium chloride used in the treatment of potable water, wastewater, or reclaimed water.