ANSI/AWWA B550-17
(Revision of ANSI/AWWA B550-10)

American Water Works Association

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AWWA Standard

Calcium Chloride

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AWWA Standard

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Foreword

*This foreword is for information only and is not a part of ANSI */AWWA B550.*

I. Introduction.

I.A. *Background.* Calcium chloride, $CaCl_2$, is produced in various states of hydration, all of which are highly deliquescent (that is, they dissolve in the water absorbed). It is obtained commercially from natural brines as a by-product of soda ash manufacture or by the reaction of calcium carbonate and hydrochloric acid.

Calcium chloride is used in water treatment as a source of soluble calcium where its addition is needed but a substantial increase in pH or alkalinity is undesirable. It can also be used to increase the calcium ion concentration in waters with high alkalinity and high sodium ion content or in waters with acceptable magnesium ion concentrations and high alkalinities. These waters can then be softened by the addition of lime, thereby reducing the alkalinity to acceptable levels. In classic municipal lime softening, this practice would be counterproductive, but for the previously mentioned uses, it is essential. Calcium chloride is less frequently used as a coagulant aid in certain waters. In some waters, the increase in chloride ion content of the water from the use of $CaCl_2$ needs to be considered. Potential impact of adding chlorides includes, but may not be limited to, finished water total dissolved solids (TDS), corrosivity, and buffering capacity.

I.B. *History.* Authorization for the development of this standard was given by the AWWA Standards Council in 1982. The first edition of the standard was developed by the AWWA Standards Committee on Quicklime, Hydrated Lime, and Calcium Chloride and was approved by the AWWA Board of Directors on June 23, 1985, with an effective date of Dec. 1, 1985. In 1988, the Softening and Conditioning Chemicals Committee assumed responsibility for maintaining and updating the standard. Subsequent editions were approved on Jan. 28, 1990, Feb. 4, 1996, Jan. 23, 2000, Jan. 16, 2005, and Jan. 17, 2010. This edition of the standard was approved on Jan. 15, 2017.

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

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

the original consortium included the Water Research Foundation (formerly AwwaRF) and the Conference of State Health and Environmental Managers (COSHEM). The American Water Works Association (AWWA) 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 jurisdictions. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Annex A, "Toxicology Review and Evaluation Procedures," of 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.

ANSI/AWWA B550 addresses additives requirements in Sec. 4.3.4 of the standard. The transfer of contaminants from chemicals to processed water or the 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 also 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 parties offering to certify products for contact with, or treatment of, drinking water.
3. Determine current information on product certification.

* Persons outside the United States should contact the appropriate authority having jurisdiction.
† NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

II. Special Issues.

II.A. *Storage and Handling Precautions.* Calcium chloride is hygroscopic (that is, it absorbs moisture from the atmosphere) and deliquescent. It should be stored in a dry place. Calcium chloride dust will rapidly absorb moisture until it is in solution.

Calcium chloride is usually dissolved in water and fed into the treatment process in solution form. Solutions may be corrosive to copper, brass, mild iron, steel, and some stainless steels. Calcium chloride will attack yellow brass and aluminum. Most synthetic rubbers, plastics, stainless steels designed for high-chloride service, and fiberglass are adequate for solution handling and storage.

When calcium chloride is dissolved in water, heat is liberated. Preparation of a 40 percent, by weight, calcium chloride solution (75 percent calcium chloride dihydrate) may increase the original water temperature by approximately 84°F (29°C). A similar 40 percent, by weight, solution prepared with anhydrous calcium chloride may increase the original water temperature by approximately 158°F (70°C). In the interest of safety and to avoid the capital cost of high-temperature equipment, hot water should not be used for dissolution, and adequate mixing should be implemented for preparing such solutions.

For safety information, refer to safety data sheets (SDSs) available from the supplier or manufacturer.

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 B550, Calcium Chloride, of latest revision.

2. Whether compliance with NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, is required.

3. Details of other federal, state or provincial, and local requirements (Section 4).

4. Quantity, form, and size required (Sec. 4.1).

5. Percent-available calcium chloride required (Sec. 4.2). Refer to the note at the end of the present section (at the end of this list).

6. Limit on insoluble matter if other than 0.5 percent, by weight (Sec. 4.3.2).

7. 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. 5.2, 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 the shipment.

8. Whether alternative security measures have been adopted to replace or augment the security measures set out in Sec. 6.2.3 and 6.2.4.

9. Form of shipment—bulk or package, type, and size of container (Sec. 6.2).

10. Basis of payment (Sec. 6.2.2.1).

11. If an affidavit of compliance or certified analysis or both is required. (Sec. 6.3)

NOTE: When purchasing calcium chloride according to the provisions of this standard, the purchaser must state the percent-available calcium chloride required. The purchase of calcium chloride should be based on percent-available calcium chloride. A minimum of 75 percent calcium chloride is desirable because both the dihydrate and anhydrous products are readily available commercial products. Less than 75 percent calcium chloride may be used effectively. The economics should be examined, especially the shipping costs (see Sec. 6.2).

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. Inclusion of new language in the Notice of Nonconformance section (Sec. 5.3).

2. Inclusion of new language in Marking section (Sec. 6.1).

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 email at standards@awwa.org.