ANSI/AWWA **B302-23**

*(Revision of ANSI/AWWA B302-16)*

AWWA Standard

# Ammonium Sulfate

**Effective date: June 1, 2023.**
First edition approved by Board of Directors July 15, 1949.
This edition approved Jan. 12, 2023.
Approved by American National Standards Institute Jan. 31, 2023.

American Water Works Association

Approved American National Standard ANSI

STANDARD Since 1881

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ISBN-13, print: 978-1-64717-132-2

ISBN-13, electronic: 978-1-61300-663-4

DOI: http://dx.doi.org/10.12999/AWWA.B302.23

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# Foreword

*This foreword is for information only and is not a part of ANSI*/AWWA B302.*

## I. Introduction.

I.A. *Background.* Ammonium sulfate, $(NH_4)_2SO_4$, is used by some water utilities as a source of ammonia in the formation of chloramines and as an activating agent in the formation of activated silica. It is readily soluble in water and consists of rhombic crystals or fine granules that, if pure, are colorless or white and odorless. Commercial grades of ammonium sulfate have a pinkish to brown color as a result of traces of iron and organic compounds contained in the source of the material.

Ammonium sulfate used for potable water treatment is usually a byproduct in the manufacture of caprolactam, a nylon-based material. It is available at a commercial strength of 99 percent ammonium sulfate. Ammonium sulfate obtained as a byproduct in the manufacture of coal gas and coke is no longer used in potable water treatment.

Ammonium sulfate can be prepared free of contaminants by reacting ammonia and sulfuric acid. Food-grade ammonium sulfate, which is used as a dough conditioner and in yeast food, is produced in this manner. The cost of the food-grade material is several times greater than the commercial-grade material; however, some states require food-grade material for use in potable water treatment.

Depending on its source, ammonium sulfate material has a tendency to cake and arch when stored in bulk. This behavior can be prevented by the addition of a small amount of amorphous silica (0.06–0.1 percent), a type of fused silica.

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

I.B. *History.* The first edition of this standard was prepared by the AWWA Water Purification Division. It was approved as tentative on July 15, 1949, and made standard on May 15, 1953, with the designation of AWWA B400-53. The second edition was prepared by AWWA Committee 7400P and was approved on Jan. 27, 1964, with the designation of AWWA B302-64. The third and fourth editions were prepared by the AWWA Standards Committee on Taste and Odor Control Chemicals and were approved on Jan. 25, 1981, and June 22, 1986, respectively. Subsequent editions were prepared by the AWWA Standards Committee on Disinfectants and

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approved by the Board of Directors on June 17, 1995; June 11, 2000; Jan. 16, 2005; June 20, 2010; and June 19, 2016. This edition was approved on Jan. 12, 2023.

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 Water Research Foundation (formerly AwwaRF) and the Conference of State Health and Environmental Managers (COSHEM). 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 four standards developed under the direction of NSF[‡]: NSF/ANSI/CAN[§] 60, Drinking Water Treatment Chemicals—Health Effects, NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects, NSF/ANSI/CAN 372, Drinking Water System Components—Lead Content, and NSF/ANSI/CAN 600, Health Effects Evaluation and Criteria for Chemicals in Drinking Water.

Various certification organizations may be involved in certifying products in accordance with NSF/ANSI/CAN 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.

NSF/ANSI/CAN 600 (which formerly appeared in NSF/ANSI/CAN 60 and 61 as Annex A, "Toxicology Review and Evaluation Procedures") 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 NSF/ANSI/CAN 600 procedures may not always be identical, depending on the certifier.

ANSI/AWWA B302 addresses additives requirements in Sec. 4.3.4 of the standard. The transfer of contaminants from chemicals to processed water or to residual solids is

[†] Persons outside the United States should contact the appropriate authority having jurisdiction.
[‡] NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.
[§] Standards Council of Canada, 55 Metcalfe Street, Suite 600, Ottawa, ON K1P 6L5 Canada



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becoming a problem of greater 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/CAN 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.

**II. Special Issues.** This standard has no applicable information for this section.

**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 B302, Ammonium Sulfate, of latest revision.
2. Quantity of ammonium sulfate required.
3. Whether compliance with NSF/ANSI/CAN 60, Drinking Water Treatment Chemicals—Health Effects, is required.
4. Details of federal, state, provincial, territorial, and local requirements (Section 4).
5. Whether the ammonium sulfate shall contain an anticaking agent (Sec. 4.1.2).
6. Whether optional markings will be required (Sec. 6.1.2).
7. Method of packaging and shipping required (Sec. 6.2).
8. An affidavit of compliance or certified analysis, or both, if required (Sec. 6.3).
9. 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 a shipment.



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

III.B. *Modification to Standard.* Any modification of 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. Minor boilerplate language updates in the following sections:
    - I.C. Acceptance
    - III.A. Purchaser Options and Alternatives
    - Section 2: References
    - Section 4: Requirements
    - Sec. 4.3.4 Product Certifications
    - Sec. 6.2.4.2 Chain of Custody

**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.



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ANSI/AWWA B302-23
(Revision of ANSI/AWWA B302-16)

American Water Works Association

*Dedicated to the World's Most Important Resource®*

AWWA Standard

# Ammonium Sulfate

## SECTION 1: GENERAL

### Sec. 1.1 Scope

This standard describes ammonium sulfate, $(NH_4)_2SO_4$, for use in the treatment of potable water, wastewater, and reclaimed water.

### Sec. 1.2 Purpose

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

### Sec. 1.3 Application

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



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