ANSI/AWWA B302-05
(Revision of ANSI/AWWA B302-00)

American Water Works Association

The Authoritative Resource on Safe Water℠

AWWA Standard

Ammonium Sulfate

ANSI American National Standards Institute

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AWWA Standard

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AWWA unites the entire water community by developing and distributing authoritative scientific and technological knowledge. Through its members, AWWA develops industry standards for products and processes that advance public health and safety. AWWA also provides quality improvement programs for water and wastewater utilities.

Committee Personnel

The AWWA Standards Committee on Disinfectants, which developed and approved this standard, had the following personnel at the time of approval:

K. Blake Stark, *Chair*

Gary F. Trojak, *Vice-Chair*

General Interest Members

P.E. Cote, Earth Tech, Cumberland, Maine	(AWWA)
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*Liaison

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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 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, which, 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 by-product in the manufacture of caprolactam, a nylon-base material. It is available at a commercial strength of 99 percent ammonium sulfate. Ammonium sulfate obtained as a by-product 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 arc when stored in bulk. This 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 (MSDS) 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 B400-53. The second edition was prepared by AWWA Committee 7400P and was approved on Jan. 27, 1964, with the designation of 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. The fifth edition was prepared by the AWWA Standards Committee on Disinfectants and approved on June 17, 1995. The

sixth edition, ANSI/AWWA B302-00, was approved by the AWWA Board of Directors on June 11, 2000. This edition was approved on Jan. 16, 2005.

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 all direct and indirect drinking water additives. Other members of the original consortium included the American Water Works Association Research Foundation (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 state 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.

ANSI/AWWA B302 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 greater concern. The language in Sec. 4.3.4 is a recommendation only for direct additives used in the treatment of potable water

*Persons outside the US should contact the appropriate authority having jurisdiction.

†NSF International, 789 N. Dixboro Rd., Ann Arbor, MI 48105.

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

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 all 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 items should be provided by the purchaser:

1. Standard used—that is, ANSI/AWWA B302, Standard for Ammonium Sulfate, of latest revision.
2. Quantity of ammonium sulfate required.
3. Whether compliance with NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, is required.
4. Whether the ammonium sulfate shall contain an anticaking agent (Sec. 4.1.2).
5. Whether optional markings will be required (Sec. 6.1.2).
6. Method of packaging and shipping required (Sec. 6.2).
7. Whether an affidavit of compliance (Sec. 6.3) is required.

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. Sec. III has been revised to approved wording.
2. Sec. III.A has been revised to approved wording.
3. An impurity limit (Sec. 4.3.2.4) and a test procedure for caprolactam (Sec. 5.2.9) have been added.

V. Comments. If you have any comments or questions about this standard, please call the AWWA Volunteer and Technical Support Group at (303) 794-7711, FAX (303) 795-7603, or write to the group at 6666 West Quincy Avenue, Denver, CO 80235-3098, or e-mail at standards@awwa.org.

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AWWA Standard

Ammonium Sulfate

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes ammonium sulfate, $(NH_4)_2SO_4$, for use in water supply service.

Sec. 1.2 Purpose

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

Sec. 1.3 Application

This standard can be referenced in specifications 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 only to ammonium sulfate used in water supply service applications.