

ANSI/AWWA **B305-22**  
(Revision of ANSI/AWWA B305-15)

AWWA Standard

# Anhydrous Ammonia

**Effective date: May 1, 2023.**

First edition approved by the Board of Directors Feb. 12, 2006.

15<sup>th</sup> edition approved Oct. 24, 2022.

Approved by American National Standards Institute Jan. 19, 2023.



American Water Works  
Association



## AWWA Standard

This document is an American Water Works Association (AWWA) standard. It is not a specification. AWWA standards describe minimum requirements and do not contain all of the engineering and administrative information normally contained in specifications. The AWWA standards usually contain options that must be evaluated by the user of the standard. Until each optional feature is specified by the user, the product or service is not fully defined. AWWA publication of a standard does not constitute endorsement of any product or product type, nor does AWWA test, certify, or approve any product. The use of AWWA standards is entirely voluntary. This standard does not supersede or take precedence over or displace any applicable law, regulation, or code of any governmental authority. AWWA standards are intended to represent a consensus of the water industry that the product described will provide satisfactory service. When AWWA revises or withdraws this standard, an official notice of action will be placed in the Official Notice section of *Journal AWWA*. The action becomes effective on the first day of the month following the month of *Journal AWWA* publication of the official notice.

## American National Standard

An American National Standard implies a consensus of those substantially concerned with its scope and provisions. An American National Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an American National Standard does not in any respect preclude anyone, whether that person has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. American National Standards are subject to periodic review, and users are cautioned to obtain the latest editions. Producers of goods made in conformity with an American National Standard are encouraged to state on their own responsibility in advertising and promotional materials or on tags or labels that the goods are produced in conformity with particular American National Standards.

**CAUTION NOTICE:** The American National Standards Institute (ANSI) approval date on the front cover of this standard indicates completion of the ANSI approval process. This American National Standard may be revised or withdrawn at any time. ANSI procedures require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of ANSI approval. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036; (212) 642-4900, or e-mailing [info@ansi.org](mailto:info@ansi.org).



ISBN-13, print: 978-1-64717-121-2

ISBN-13, electronic: 978-1-61300-660-3

DOI: <http://dx.doi.org/10.12999/AWWA.B305.22>

---

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including scanning, recording, or any information or retrieval system. Reproduction and commercial use of this material is prohibited, except with written permission from the publisher.

Copyright © 2022 by American Water Works Association  
Printed in USA

## Committee Personnel

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

K. Blake Stark, *Chair*

### *General Interest Members*

S. Alpert (*liaison, nonvoting*), Hazen and Sawyer, Nashville, Tenn.

K.K. Au, Consultant, Naperville, Ill.

N.J. Edman (*liaison, nonvoting*), Standards Group Liaison, AWWA, Denver, Colo.

M.C. Graves, Weston Solutions, Inc., Austin, Tex.

R. Hampaul, Indigenous Services Canada, Nanaimo, B.C.

M. Sivaganesan, US Environmental Protection Agency, Cincinnati, Ohio

K.B. Stark, NSF International, Ann Arbor, Mich.

A. Waldron, City of Englewood, Englewood, Colo.

### *Producer Members*

M. Guzman, The Chlorine Institute, Arlington, Va.

E.M. Meyer, Solenis, Charleston, Tenn.

J. Mock, Olin Chlor Alkali Products, Cleveland, Tenn.

D.S. Weatherup, De Nora Water Technologies, Colmar, Pa.

### *User Members*

R.C. Lorenz, Westerville Water Plant, Westerville, Ohio

C.L. McLain, Consultant, Moorhead, Minn.

F. Noce, Lake County Department of Utilities, Painesville, Ohio

L. Olson, New Jersey American Water, Colts Neck, N.J.

P.R. Riendeau, New England Water Works Association, Holliston, Mass.

This page intentionally blank.

Currently in preview, click buy full version

# Contents

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

SEC.	PAGE	SEC.	PAGE
<b>Foreword</b>		<b>2</b>	
I	vii	<b>References</b> .....	2
I.A	vii	<b>3</b>	
I.B	vii	<b>Definitions</b> .....	2
I.C	vii	<b>4</b>	
II	ix	<b>Requirements</b>	
II.A	ix	4.1	3
III	ix	4.2	3
III.A	ix	4.3	4
III.B	ix	<b>5</b>	
IV	x	<b>Verification</b>	
V	x	5.1	4
		5.2	5
		5.3	5
		5.4	5
		<b>6</b>	
		<b>Delivery</b>	
<b>1</b>		6.1	6
<b>1.1</b>	1	6.2	6
<b>1.2</b>	1	6.3	7
<b>1.3</b>	1		

This page intentionally blank.

Currently in preview, click buy full version

# Foreword

*This foreword is for information only and is not a part of ANSI/AWWA B305.*

## **I. Introduction.**

I.A. *Background.* Anhydrous ammonia is a pungent, colorless gas at room temperature and atmospheric pressure. It is a compound formed by the elements hydrogen and nitrogen with a chemical formula of  $\text{NH}_3$ . In the water industry, anhydrous ammonia is combined with chlorine to form chloramines.

Anhydrous ammonia is produced when a preheated mixture of hydrogen and nitrogen is subjected to pressure over an iron oxide catalyst.

There are several generally accepted grade designations for anhydrous ammonia, including:

- commercial
- agricultural
- refrigeration
- technical
- metallurgical
- electronic.

More detailed information on anhydrous ammonia may be found in the Compressed Gas Association<sup>†</sup> publication CGA G-2 (latest revision).

I.B. *History.* The first edition of ANSI/AWWA B305 was approved by the AWWA Board of Directors on Feb. 12, 2006. The standard was approved and promulgated in the course of the activities of the AWWA Committee on Disinfectants. The second edition was approved by the AWWA Board of Directors on Jan. 24, 2015. This edition was approved on Oct. 24, 2022.

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.

---

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

† Compressed Gas Association Inc., 8484 Westpark Drive, Suite 220, McLean, Virginia 22102.

In the United States, authority to regulate products for use in, or in contact with, drinking water rests with individual states.<sup>‡</sup> 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<sup>§</sup>: NSF/ANSI/CAN<sup>¶</sup> 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 jurisdiction. 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 Procedure”) 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 B305 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. 4.3.5 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 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.

<sup>‡</sup> Persons outside the United States should contact the appropriate authority having jurisdiction.

<sup>§</sup> NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

<sup>¶</sup> Standards Council of Canada, 55 Metcalfe Street, Suite 600, Ottawa, ON K1P 6L5 Canada.

## II. Special Issues.

II.A. *Safety.* Anhydrous ammonia is usually shipped and stored as a liquid under pressure and should be treated as any pressurized gas. Anhydrous ammonia is considered a nonflammable gas by the US Department of Transportation (USDOT) and is also listed as a hazardous gas with a reportable quantity of 100 lb (45 kg).

Federal safety regulations promulgated by the US Occupational Safety and Health Administration, USEPA, and the USDOT that apply to this material should be implemented.

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 B305, Standard for Anhydrous Ammonia, of latest revision.

2. Size and type of bulk storage container to be used, and details on transfer equipment available for receiving bulk shipments. If bulk storage is not used, state the required container sizes.

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. Physical form(s) and quantity (Sec. 4.1.1).

6. Specific maximum impurity content limits if required (Sec. 4.3).

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. 5.3, 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.

8. 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.

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

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. 4.3.5 Product Certifications
  - Sec. 5.4.2 Notice of Nonconformance
  - Sec. 6.3 Affidavit of Compliance or Certified Analysis

**V. Comments.** If you have any comments or questions about this standard, please call the AWWA Engineering and Technical Service 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](mailto:standards@awwa.org).



**American Water Works  
Association**

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

**ANSI/AWWA B305-22**  
(Revision of ANSI/AWWA B305-15)

**AWWA Standard**

---

# Anhydrous Ammonia

---

## SECTION 1: GENERAL

---

### **Sec. 1.1 Scope**

This standard describes the use of anhydrous ammonia in the treatment of potable water, wastewater, and reclaimed water. Anhydrous ammonia is expressed by the formula  $\text{NH}_3$ . *Anhydrous* means free from water.

### **Sec. 1.2 Purpose**

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

### **Sec. 1.3 Application**

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