ANSI/AWWA B504-12
(Revision of ANSI/AWWA B504-05)

American Water Works Association

The Authoritative Resource on Safe Water®

AWWA Standard

Monosodium Phosphate, Anhydrous and Liquid

Effective date: Aug. 1, 2012.
First edition approved by AWWA Board of Directors Jan. 25, 1988.
This edition approved Jan. 22, 2012.
Approved by American National Standards Institute June 1, 2012.

6666 West Quincy Avenue
Denver, CO 80235-3098
T 800.926.7337
www.awwa.org

Advocacy
Communications
Conferences
Education and Training
Science and Technology
Sections

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 codes of any governmental authority. AWWA standards are intended to represent a consensus of the water supply industry that the product described will provide satisfactory service. When AWWA revises or withdraws this standard, an official notice of action will be placed on the first page of the Official Notice section of *Journal - American Water Works Association*. The action becomes effective on the first day of the month following the month of *Journal - American Water Works Association* 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 emailing info@ansi.org.

ISBN-13, print:	978-1-58321-896-9	eISBN-13, electronic:	978-1-61300-189-9
ISBN-10, print:	1-58321-896-3	eISBN-10, electronic:	1-61300-189-4

Committee Personnel

The AWWA Standards Committee on Scale and Corrosion-Control Chemicals, which reviewed and approved this standard, had the following personnel at the time of approval:

Robert A. Ryder, *Chair*

General Interest Members

J.H. Bambei Jr.,* Denver Water, Denver, Colo. (AWWA)
M.P. Chaulk, CBCL Limited Consultants Ltd., Halifax Regional Municipality, N.S. (AWWA)
M.S. McFadden, HDR Engineering Inc., Bellevue, Wash. (AWWA)
D. Orozco, Cole & Associates Engineers, Safety Harbor, Fla. (AWWA)
R.A. Ryder, Kennedy/Jenks Consultants, San Francisco, Calif. (AWWA)
S.J. Posavec,* Standards Group Liaison, AWWA, Denver, Colo. (AWWA)
R. Vaidya, Camp Dresser & McKee, Tampa, Fla. (AWWA)

Producer Members

H.T. Belcher Jr., Corrtrac Systems Corporation, Currituck, N.C. (AWWA)
C.P. Principi, Carus Corporation, Belmont, N.C. (AWWA)
V.J. Verdone, Pristine Water Solutions Inc., Waukegan, Ill. (AWWA)
Y. Zhang, DXV Water Technologies Inc., Tustin, Calif. (AWWA)

User Members

E.J. Kiefer, North Shore Water Commission, Milwaukee, Wis. (AWWA)
R.M. Powell, Pinellas County Utilities, Largo, Fla. (AWWA)
J.C. Thurrott, City of Daytona Beach, Daytona Beach, Fla. (AWWA)

* Liaison, nonvoting

This page intentionally blank.

Contents

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

This page intentionally blank.

Foreword

This foreword is for information only and is not a part of ANSI/AWWA B504.*

I. Introduction.

I.A. *Background.* Phosphate chemicals are among the few recognized substances that can be safely and effectively used in water for corrosion treatment. There are several phosphate technologies available, one of which is monosodium phosphate (MSP, NaH_2PO_4). Monosodium phosphate is a manufactured product obtained by combining a comparatively pure chemical, soda ash (Na_2CO_3) or caustic soda (NaOH, sodium hydroxide), with phosphoric acid (H_3PO_4).

Monosodium phosphate, anhydrous, is a white, crystalline solid, commercially available in granular and powder forms. Monosodium phosphate is also found as a clear liquid. A solution of 1 lb/gal (0.12 kg/L, 34 percent by weight) has a specific gravity of approximately 1.30 at 20°C (70°F).

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

I.B. *History.* In 1985, the AWWA Standards Committee on Scale and Corrosion-Control Chemicals recognized the need for a standard for monosodium phosphate, anhydrous, used as a corrosion-control product in the treatment of potable water. The AWWA Standards Council authorized development of this standard on Nov. 18, 1985, and the first edition was approved on Jan. 25, 1988. The second edition of the standard was approved on June 19, 1994. The third edition of the standard was approved on Jan. 21, 2001. The fourth edition of ANSI/AWWA B504 was approved on June 12, 2005. This fifth edition was approved by the AWWA Board of Directors 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

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

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 Systems 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.

ANSI/AWWA B504 addresses additives requirements in Sec. 4.3.3 of the standard. The transfer of contaminants from chemicals to processed water or to the residual solids is becoming a problem of great concern. The language in Sec. 4.3.3 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 N. Dixboro Road, Ann Arbor, MI 48105.

II. Special Issues.

II.A. *Storage and Handling Precautions.* Monosodium phosphate, anhydrous, is slightly deliquescent in nature and must be stored under dry conditions. Exposure to humidity produces a caked condition. This results in poor flow and caking that interferes with the rate of dilution. Liquid monosodium phosphate is considered non-hazardous. However, because the pH is between 4 and 5, handle as an acidic solution. Store in polyethylene, FRP, epoxy, rubber-lined mild steel, or stainless-steel containers in a cool, dry area. Protect containers from physical damage and freezing. Refer to the material safety data sheets (MSDS) available from the manufacturer or supplier for additional information.

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 B504, Standard for Monosodium Phosphate, Anhydrous and Liquid, of latest revision.
2. Whether compliance with NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, is required.
3. Physical form(s) and quantity (Secs. 4.1.1 and 4.1.2).
4. Specific maximum impurity content limits, if required (Sec. 4.3).
5. Details of other federal, state or provincial, and local requirements (Section 4).
6. Whether alternative security measures have been adopted to replace or augment the security measures set out in Secs. 6.2.3 and 6.2.4.
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 specifications or the absence of, or irregularities in, seals may be sufficient cause to reject the shipment.
8. Form of shipment—bulk or package, type and size of container (Sec. 6.2).
9. 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. Inclusion of the liquid form of monosodium phosphate.
2. Inclusion of a requirement for compliance with the Safe Drinking Water Act and other federal regulations (Section 4).
3. Inclusion of a requirement for tamper-evident packaging (Sec. 6.2.3 and 6.2.4).

V. Comments. If you have any comments or questions about this standard, please call the AWWA Engineering & Technical Services Department 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.

ANSI/AWWA B504-12
(Revision of ANSI/AWWA B504-05)

American Water Works Association

AWWA Standard

Monosodium Phosphate, Anhydrous and Liquid

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes monosodium phosphate, anhydrous and liquid, for use in the treatment of potable water, wastewater, and reclaimed water. The product described is an orthophosphate used as formulated and in blends to inhibit corrosion of water conveyance systems. The product described by this standard is also known as sodium phosphate, monobasic, anhydrous and liquid.

Sec. 1.2 Purpose

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

Sec. 1.3 Application

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