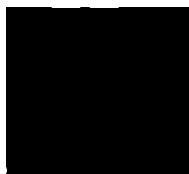


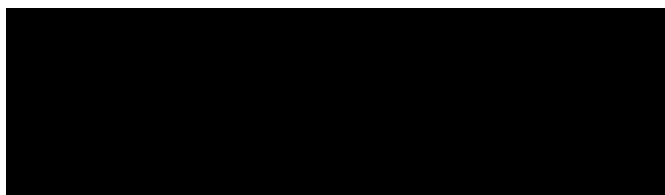
American Water Works Association

ANSI/AWWA B303-00

(Revision of ANSI/AWWA B303-95)



AWWA STANDARD
FOR
SODIUM CHLORITE



Effective date: January 1, 2001.

First edition approved by AWWA Board of Directors June 1, 1967.

This edition approved June 11, 2000.

Approved by American National Standards Institute October 6, 2000.

AMERICAN WATER WORKS ASSOCIATION

6666 West Quincy Avenue, Denver, Colorado 80235

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. 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 classified advertising 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 publication. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute, 11 W. 42nd St., New York, NY 10036; (212) 642-4900.

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information or retrieval system, except in the form of brief excerpts or quotations for review purposes, without the written permission of the publisher.

Copyright © 2000 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 of approval:

Robert D. Harriger, *Chair*

Gary F. Trojak, *Vice-Chair*

Consumer Members

B.S. Aptowicz, Philadelphia Water Department, Philadelphia, Pa.	(AWWA)
J.T. Harvey, Little Rock Municipal Water Works, Little Rock, Ark.	(AWWA)
A.A. Khan, Pepsico, Arlington, Texas	(AWWA)
Stephen Poole, Aqualta Engineering, Edmonton, Alta.	(AWWA)
D.L. Saenz, Los Angeles Water and Power, Sylmar, Calif.	(AWWA)
A.T. Segars, Miami-Dade Water and Sewer Department, Hialeah, Fla.	(AWWA)

General Interest Members

P.E. Cote, Earth Tech, Cumberland, Maine	(AWWA)
J.H. Buckler,* Council Liaison, St. Louis County Water Company, St. Louis, Mo.	(AWWA)
D.J. Gates, Citrus Heights, Calif.	(AWWA)
R.D. Harriger, Eaglebrook Inc., Williamsburg, Va.	(AWWA)
S.J. Posavec,* Staff Liaison, AWWA, Denver, Colo.	(AWWA)
K.B. Stark, NSF International, Ann Arbor, Mich.	(AWWA)

Producer Members

David Hildebrand, Vulcan Chemicals, Wichita, Kan.	(CI)
W.B. Huebner, Wallace & Tiernan Inc., Belleville, N.J.	(AWWA)
P.A. Ross, Dow Chemical USA, Freeport, Texas	(AWWA)
G.F. Trojak, The Chlorine Institute Inc., Washington, D.C.	(CI)

*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.

SEC.	PAGE	SEC.	PAGE
Foreword		4.3	Impurities..... 3
I	Introduction..... vii	5	Verification
I.A	Background..... vii	5.1	Sampling 4
I.B	History viii	5.2	Test Procedures—General 6
I.C	Acceptance..... viii	5.3	Test Procedure for Sodium Chlorite, Idometric Method 6
II	Special Issues ix	5.4	Test Procedure for Sodium Hydroxide 7
II.A	Handling, Storage, and Safety Precautions..... x	5.5	Test Procedure for Sodium Carbonate 8
III	Use of This Standard..... xi	5.6	Test Procedure for Sodium Chloride..... 9
III.A	Purchaser Options and Alternatives xi	5.7	Test Procedure for Sodium Sulfate 9
III.B	Modification to Standard..... xi	5.8	Test Procedure for Arsenic 10
IV	Major Revisions..... xi	5.9	Test Procedure for Sodium Nitrate... 10
V	Comments..... xii	5.10	Test Procedure for Sodium Chlorate 11
Standard		5.11	Rejection..... 12
1	General	6	Delivery
1.1	Scope 1	6.1	Marking..... 13
1.2	Purpose 1	6.2	Packaging and Shipping 13
1.3	Application..... 1	6.3	Affidavit of Compliance..... 14
2	Reference 2	Figure	
3	Definitions 2	1	Crystallization Temperature of Sodium Chlorite Solutions 4
4	Requirements		
4.1	Physical Requirements 2		
4.2	Chemical Requirements 2		

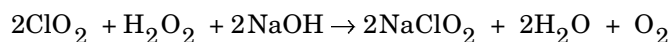
This page intentionally blank.

Foreword

This foreword is for information only and is not a part of AWWA B303.

I. Introduction.

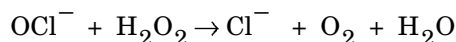
I.A. *Background.* Sodium chlorite is made by the partial reduction of sodium chlorate to chlorine dioxide and the chlorine dioxide's subsequent conversion to sodium chlorite in an alkaline solution in the presence of hydrogen peroxide. An excess of both peroxide and caustic is present to ensure complete reaction as follows:



Under unfavorable conditions, ClO_2 is also known to disproportionate to chlorite and chlorate as follows:



Any chlorine present would be in the hypochlorite form because of the strong alkaline conditions. Any chlorate ion so formed is recycled through the process to optimize recovery of sodium chlorite. Hypochlorite will react with hydrogen peroxide to yield chloride as follows:



Because there is no source of ammonia or nitrogen in the process, chloramines will not be present as an impurity.

Sodium chlorite is a dry flaked salt, which, because of its powerful oxidizing nature, is shipped in steel drums bearing DOT Yellow (Class 5.1) oxidizer label. Dry flaked material is formulated by mixing sodium chlorite solutions with stabilizing salts in solution prior to either drying or filtering. The drying or filtering may be coincidental with spraying under atomizing conditions to achieve particle uniformity for flaking characteristics. As marketed in the solid form, sodium chlorite contains approximately 80 percent by weight sodium chlorite; in the aqueous form, it contains approximately 40 percent or less by weight sodium chlorite. Technical sodium chlorite is a white flaked salt with a density of approximately 56 lb/ft³ (0.90 g/cc). Some

material may have a tint of orange, depending on the iron content. Sodium chlorite is stable when sealed or in solution but can ignite in the presence of organic materials. For this reason, the solution should not be allowed to dry out on floors but should be hosed down with minimum splashing.

Sodium chlorite dissolves easily in water at ordinary temperatures to form a pale-yellow solution. This solution is chemically stable under ordinary conditions of temperature and pressure. Solutions above 25–30 percent weight per weight (w/w) may crystallize at moderate ambient temperatures. Crystallization temperatures may vary due to solutions originating either from dilution of slurried or dried materials.

Sodium chlorite used for the on-site production of chlorine dioxide for use as a disinfectant in the treatment of drinking water or for pesticidal use in processing plant-flume water, sewage treatment, slime control in paper mills, and bacteria control in oil wells requires US Environmental Protection Agency (USEPA) registration. Sodium chlorite to be sold and used for drinking water treatment must be registered under a label or labels indicating these uses.

I.B. History. The original AWWA Standard for Sodium Chlorite was prepared by Committee 7440P. The standard was approved as tentative on Jan. 25, 1965, and made a standard by the AWWA Board of Directors on June 1, 1967. The standard was designated AWWA B303-67.

The AWWA Standards Committee on Chlorine, Chlorine Compounds, and Related Alkalies prepared the 1988 edition approved by the AWWA Board of Directors on June 19, 1988. The AWWA Standards Committee on Disinfectants prepared the 1995 edition approved by the Board of Directors on June 17, 1995. This edition was approved on June 11, 2000.

I.C. Acceptance. In May 1985, the U.S. 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, ANSI†/NSF‡ 60, Drinking Water Treatment Chemicals—Health Effects, and ANSI/NSF 61, Drinking Water System Components—Health Effects.

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

AWWA B303-00 addresses additives requirements in Sec. 4.3 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. 4.3.3 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 ANSI/NSF Standard 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.

*Persons in Canada, Mexico, and non-North American countries should contact the appropriate authority having jurisdiction.

†American National Standards Institute, 11 W. 42nd St., New York, NY 10036.

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