



**American Water Works
Association**

The Authoritative Resource for Safe Drinking Water®

ANSI/AWWA B300-04
(Revision of ANSI/AWWA B300-99)

AWWA Standard

Hypochlorites



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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.

SEC.	PAGE	SEC.	PAGE
<i>Foreword</i>		2	References..... 2
I	Introduction..... vii	3	Definitions 2
I.A	Background..... vii	4	Requirements
I.B	History..... viii	4.1	Physical Requirements 2
I.C	Acceptance ix	4.2	Chemical Requirements 4
II	Special Issues..... x	4.3	Impurities 4
II.A	Storage and Handling Precautions..... x	5	Verification
II.B	Available Chlorine x	5.1	Sampling..... 5
II.C	Sodium Hypochlorite xi	5.2	Test Procedures..... 6
II.D	Bromate in Sodium Hypochlorite.... xii	5.3	Notice of Nonconformance 8
III	Use of This Standard xii	6	Delivery
III.A	Purchaser Options and Alternatives. xii	6.1	Marking..... 9
III.B	Modification to Standard..... xiii	6.2	Packaging and Shipping..... 9
IV	Major Revisions xiii	6.3	Affidavit of Compliance..... 10
V	Comments xiii		
<i>Standard</i>			
1	General	<i>Table</i>	
1.1	Scope 1	F.1	Chlorine Available in Sodium
1.2	Purpose 1		Hypochlorite..... viii
1.3	Application 1		

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Foreword

This foreword is for information only and is not part of ANSI/AWWA B300.

I. Introduction.

I.A. *Background.* *Hypochlorites* is used as an all-inclusive term for chlorinated lime, calcium hypochlorite, and sodium hypochlorite. A concise description of each chemical follows.

Chlorinated lime: 25 percent to 37 percent available chlorine. Other common names for chlorinated lime are bleaching powder and chloride of lime. Because it is an unstable material and is subject to deterioration from heat and moisture, it is not usually fed dry but as a 2 percent solution. Excess insolubles present in this solution must be separated by decantation before use. Storage in a cool, dry area, for no more than nine months, is advisable. Chlorinated lime is available in 100-lb (45.4-kg), 300-lb (136-kg), and 800-lb (363-kg) drums. Approximately 0.25 lb/gal (30 g/L) of water will produce a solution of approximately 1 percent available chlorine.

Calcium hypochlorite: 65 percent to 70 percent available chlorine. This material is unstable but more stable than the grade with 35 percent available chlorine. It is best fed as a solution. Its theoretical solubility is approximately 22 g/100 mL of water (18 percent) at room temperature; however, its practical solubility use is closer to 3 percent. Decantation is advisable before use because of the excess insolubles present. Storage in a cool, dry area is advisable, but storage periods should not exceed one year. Calcium hypochlorite can lose 3 percent to 10 percent available chlorine in one year. It is available in 3-lb to 5-lb (1.4-kg to 2.3-kg) cans, 2-lb to 9-lb (0.9-kg to 4.1-kg) plastic containers, and 100-lb (45.4-kg) steel drums and in granular powder, granule, and tablet form. Solubility tests that determine both rate and percentage should be conducted with particular emphasis on testing the tablets. Approximately $\frac{1}{8}$ lb/gal (15 g/L) of calcium hypochlorite to water produces a solution of approximately 1 percent available chlorine.

Sodium hypochlorite: 12 percent to 20 percent available chlorine. Other common names for sodium hypochlorite are bleach, liquor, chlorine water, and Javelle water. Sodium hypochlorite will undergo some decomposition over time. There are numerous parameters that affect the rate of decomposition (see The Chlorine Institute* Pamphlet 96, *Sodium Hypochlorite Manual*).

*The Chlorine Institute Inc., 1300 Wilson Blvd., Rosslyn, VA 22209.

Sodium hypochlorite is miscible in any proportion with water. It should be stored in a dark area where the temperature does not exceed 80°F (30°C). A 12 percent to 20 percent solution is still liquid at 0°F (–17.8°C) but is a slush at –20°F (–28.9°C). It is available in 5-gal and 13-gal (19-L and 49-L) carboys (glass or polyethylene), 30-gal (113.6-L) drums, and in approximately 5,000-gal (18,926-L) tank trucks. The available chlorine content is as indicated in Table F.1.

I.B. History. The original AWWA Standard for Hypochlorites, prepared for the AWWA Water Purification Division, was approved by the Executive Committee of the Water Purification Division and by the Water Works Practice Committee and received approval by the AWWA Board of Directors on June 2, 1953. It was designated ANSI/AWWA B300-53T.

The initial document was reaffirmed without revision on June 17, 1955, and the designation was changed from ANSI/AWWA B300-53T to ANSI/AWWA B300-55. Subsequent revisions were adopted on June 5, 1964, Jan. 26, 1975, June 15, 1980, and June 14, 1987. This standard was revised by the AWWA Standards Committee on Disinfectants. ANSI/AWWA B300-99 edition was approved by the AWWA Board of Directors on June 20, 1999. This edition was approved by the AWWA Board of Directors on June 13, 2004.

Table F.1 Chlorine available in sodium hypochlorite

gpl Available Chlorine	Trade % Available Chlorine	Chlorine Equivalent <i>lb/gal</i>	Chlorine Equivalent <i>kg/L</i>	Gallons to Obtain 1 lb Chlorine	Liters to Obtain 1 kg Chlorine
200	20.0	1.630	0.200	0.61	5.0
160	16.0	1.333	0.160	0.752	6.25
150	15.0	1.250	0.150	0.800	6.667
120	12.5	1.000	0.120	1.00	8.333
50	5.0	0.417	0.050	2.40	20.0
10	1.0	0.083	0.010	12.00	100.0

Sample Calculation:

12 trade percent available chlorine = 120 grams per liter (gpl) available chlorine

120 gpl $\times$ 3.785 L/gal $\times$ 2.205 lb/1,000 g = 1 lb/gal available chlorine

I.C. *Acceptance.* In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with a consortium led by NSF International (NSI) 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 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 B300 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 great concern. The language in Sec. 4.3 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

*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 W. 43rd St., Fourth Floor, New York, NY 10036.