



**American Water Works
Association**

The Authoritative Resource for Safe Drinking WaterSM

ANSI/AWWA B512-02
(Revision of ANSI/AWWA B512-97)

AWWA Standard

Sulfur Dioxide



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Foreword

This foreword is for information only and is not part of AWWA B512.

I. Introduction.

I.A. *Background.* Sulfur dioxide (SO_2), or sulfurous oxide, is a colorless, nonflammable, pungent, suffocating gas. This reducing agent is widely used to remove chlorine and other oxidants from water. Sulfur dioxide is corrosive to mild steel if moisture is present.

Sulfur dioxide is manufactured by burning sulfur in air or from the roasting and smelting of sulfide ores. Generally, sulfur dioxide is purified by using intricate scrubbing methods to remove metal impurities. The sulfur dioxide gas is compressed to form liquid sulfur dioxide, which can then be fed either as a liquid or as a gas. Sulfur dioxide liquid or gas is commercially available at nominally 100 percent strength.

Sulfur dioxide dosage for dechlorination is based on the level of residual chlorine to be removed. The required theoretical dosage for dechlorination is 0.9 mg/L of SO_2 per 1.0 mg/L of residual chlorine (not chlorine dosage). In practice, a ratio of 1:1 is generally used.

Sulfur dioxide mixed with water reacts almost instantaneously with chlorine, converting the chlorine (Cl_2) to chloride (Cl^-) and the residual sulfur dioxide to sulfate (SO_4^{2-}).

When plant capacity is expressed in million gallons per day (mgd), the sulfur dioxide feed rate in pounds per day can be calculated using the following formula:

$$\text{SO}_2 \text{ lb/d} = \text{Cl}_2 \text{ residual ppm} \times 8.34 \times \text{mgd of plant}$$

The following properties of sulfur dioxide (SO_2) may be useful:

Odor	pungent
Melting point	-99°F (-72.7°C)
Boiling point at atmosphere	14.0°F (-10°C)
Specific gravity of liquid at 0°C (water = 1)	1.434
Specific gravity at 80°F (27°C)	1.363
Critical temperature	314.8°F (174.9°C)
Molecular weight	64.06

For additional information on chemical and physical properties and safety information, refer to the technical information and material safety data sheet (MSDS) available from the supplier or manufacturer and the Compressed Gas Association's (CGA's) booklet CGA G-3, *Sulfur Dioxide*.^{*}

I.B. *History.* The first edition of ANSI/AWWA B512, Standard for Sulfur Dioxide, was developed by the AWWA Standards Committee on Taste and Odor Control Chemicals, and was approved by the AWWA Board of Directors on Jan. 27, 1991, with an effective date of June 1, 1991. AWWA B512-97 was approved by the AWWA Board of Directors on June 15, 1997. This edition was approved by the AWWA Board of Directors on Jan. 20, 2002.

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, 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

^{*}Compressed Gas Association, 1725 Jefferson Davis Highway, Ste. 1004, Arlington, VA 22202-4100.

[†]Persons outside the US should contact the appropriate authority having jurisdiction.

[‡]American National Standards Institute, 25 W. 43rd St., Fourth Floor, New York, NY 10036.

[§]NSF International, 789 N. Dixboro Rd., Ann Arbor, MI 48105.