

# Material Safety Data Sheet

## Bromine, p.a.

ACC# 95925

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** Bromine, p.a.

**Catalog Numbers:** AC196660000, AC196660010, AC196660250, AC196662500, AC402840000, AC402840010, AC402841000, AC402845000, AC611740500, S79926MF, B385-250, B385-50

**Synonyms:** Dibromine; Diatomic bromine; Bromine molecule.

**Company Identification:**

Fisher Scientific  
1 Reagent Lane  
Fair Lawn, NJ 07410

**For information, call:** 201-796-7100

**Emergency Number:** 201-796-7100

**For CHEMTREC assistance, call:** 800-424-9300

**For International CHEMTREC assistance, call:** 703-527-3887

### Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7726-95-6	Bromine	>99	231-778-1

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: dark red-brown liquid.

**Danger!** Causes eye and skin burns. Causes digestive and respiratory tract burns. May be fatal if inhaled. Strong oxidizer. Contact with other material may cause a fire. Corrosive to metal.

**Target Organs:** Eyes, skin, mucous membranes.

#### Potential Health Effects

**Eye:** Causes eye burns. Lachrymator (substance which increases the flow of tears). Vapors may cause eye injury. May cause permanent corneal opacification.

**Skin:** Contact with liquid is corrosive and causes severe burns and ulceration. Bromine exposure may cause measles-like eruptions.

**Ingestion:** Causes gastrointestinal tract burns.

**Inhalation:** May be fatal if inhaled. Causes chemical burns to the respiratory tract. Bromine vaporizes rapidly at room temperature. Potential symptoms of overexposure are dizziness, headache, nosebleed, coughing, feeling of oppression, pulmonary edema and pneumonia. Concentrations of 10 ppm or greater cause severe respiratory irritation and will not be tolerated voluntarily.

**Chronic:** Prolonged inhalation may cause respiratory tract inflammation and lung damage. Rats, mice, and rabbits inhaling 2 ppm of bromine for 4 months developed disturbances in the functions of their respiratory, nervous, and endocrine

### Section 4 - First Aid Measures

**Eyes:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

**Skin:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing

contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

**Ingestion:** If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

**Inhalation:** POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

**Notes to Physician:** Treat symptomatically and supportively.

## Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with other material may cause fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Containers may explode in the heat of a fire. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

**Extinguishing Media:** Use extinguishing media most appropriate for the surrounding fire.

**Flash Point:** Not applicable.

**Autoignition Temperature:** Not applicable.

**Explosion Limits, Lower:** Not available.

**Upper:** Not available.

**NFPA Rating:** (estimated) Health: 4; Flammability: 0; Instability: 1; Special Hazard: OX

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Clean up spills immediately, observing precautions in the Protective Equipment section. Use water spray to disperse the gas/vapor. Provide ventilation. Evacuate unnecessary personnel. Approach spill from upwind. Control runoff and isolate discharged material for proper disposal. Neutralize with lime water slurry, soda ash, or hypo solution (36.5 lb sodium thiosulfate in 50 gallons water), and flush to sump with cold water. Maintain mild ammonia atmosphere while cleaning up to minimize vapor attack.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Discard contaminated shoes. Do not breathe vapor or mist. Inform laundry personnel of contaminant's hazards. Use only with adequate ventilation or respiratory protection. Handle bromine only with equipment made of Kynar, Teflon, Monel, Pyrex, glass or lead-lined steel.

**Storage:** Keep away from heat, sparks, and flame. Do not store near combustible materials. Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Keep away from reducing agents. Loosen closure cautiously before opening.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Bromine	0.1 ppm TWA; 0.2 ppm STEL	0.1 ppm TWA; 0.7 mg/m <sup>3</sup> TWA 3 ppm IDLH	0.1 ppm TWA; 0.7 mg/m <sup>3</sup> TWA

**OSHA Vacated PELs:** Bromine: 0.1 ppm TWA; 0.7 mg/m<sup>3</sup> TWA

### Personal Protective Equipment

**Eyes:** Wear chemical splash goggles and face shield.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** dark red-brown

**Odor:** suffocating odor

**pH:** Not available.

**Vapor Pressure:** 175 mm Hg @ 20 deg C

**Vapor Density:** 5.51 (air=1)

**Evaporation Rate:** Not available.

**Viscosity:** 0.98 cps @ 20 deg C

**Boiling Point:** 58.7 deg C

**Freezing/Melting Point:** -7.2 deg C

**Decomposition Temperature:** Not available.

**Solubility:** Negligible.

**Specific Gravity/Density:** 3.11 g/cm<sup>3</sup>

**Molecular Formula:** Br<sub>2</sub>

**Molecular Weight:** 159.81

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable.

**Conditions to Avoid:** Confined spaces.

**Incompatibilities with Other Materials:** Metals, reducing agents, acrylonitrile, alcohols, ammonia, fluorine, acetaldehyde, acetylene, alkalis, arsenites, mercurous salts, hypophosphites, ignition or explosion may occur with readily oxidizable, organic, or flammable materials or chemical accelerants, ferrous salts.

**Hazardous Decomposition Products:** Hydrogen bromide.

**Hazardous Polymerization:** Has not been reported.

## Section 11 - Toxicological Information

**RTECS#:**

**CAS#** 7726-95-6: EF9100000

**LD50/LC50:**

**CAS#** 7726-95-6:

Inhalation, mouse: LC50 = 750 ppm/9M;

Inhalation, mouse: LC50 = 2900 mg/m<sup>3</sup>;

Inhalation, rat: LC50 = 2700 mg/m<sup>3</sup>;

Inhalation, rat: LC50 = 2700 mg/m<sup>3</sup>;

Oral, mouse: LD50 = 3100 mg/kg;

Oral, rabbit: LD50 = 2500 mg/kg;

Oral, rat: LD50 = 1700 mg/kg;

In a derived model for the lethal toxicity of bromine to humans, the concentrations lethal at the 50% level for a 10-minute exposure with a standard level of activity are estimated as 650, 260, and 546 ppm for the "regular, vulnerable, and average" populations, respectively; in the same populations, the estimates are 375, 150, and 315 ppm, respectively, for a 30-minute exposure. Bromine is considered to be 1.5 times less toxic than chlorine.

**Carcinogenicity:**

CAS# 7726-95-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**Epidemiology:** No information found  
**Teratogenicity:** No information found  
**Reproductive Effects:** No information found  
**Mutagenicity:** No information found  
**Neurotoxicity:** No information found  
**Other Studies:**

## Section 12 - Ecological Information

**Ecotoxicity:** No data available. No information available.  
**Environmental:** Atmospheric: It has ... been recognized that, like chlorine, any bromine entering the stratosphere will also destroy ozone catalytically. Furthermore, the bromine cycle is believed to be more efficient in destroying ozone than is the chlorine cycle.  
**Physical:** No information available.  
**Other:** No information available.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.  
**RCRA P-Series:** None listed.  
**RCRA U-Series:** None listed.

## Section 14 - Transport Information

	US DOT	Canada TDG
<b>Shipping Name:</b>	BROMINE	BROMINE
<b>Hazard Class:</b>	8	8(6.1)
<b>UN Number:</b>	UN1744	UN1744
<b>Packing Group:</b>	I	I

## Section 15 - Regulatory Information

### US FEDERAL

**TSCA**  
CAS# 7726-95-6 is listed on the TSCA inventory.

**Health & Safety Reporting List**  
None of the chemicals are on the Health & Safety Reporting List.

**Chemical Test Rules**  
None of the chemicals in this product are under a Chemical Test Rule.

**Section 12b**  
None of the chemicals are listed under TSCA Section 12b.

**TSCA Significant New Use Rule**  
None of the chemicals in this material have a SNUR under TSCA.

**CERCLA Hazardous Substances and corresponding RQs**  
None of the chemicals in this material have an RQ.

**SARA Section 302 Extremely Hazardous Substances**  
CAS# 7726-95-6: 500 lb TPQ

**SARA Codes**  
CAS # 7726-95-6: immediate, fire.

### Section 313

This material contains Bromine (CAS# 7726-95-6, >99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

#### Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

#### Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

#### OSHA:

CAS# 7726-95-6 is considered highly hazardous by OSHA.

#### STATE

CAS# 7726-95-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

### California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

### European/International Regulations

#### European Labeling in Accordance with EC Directives

#### Hazard Symbols:

T+ C N

#### Risk Phrases:

R 26 Very toxic by inhalation.

R 35 Causes severe burns.

R 50 Very toxic to aquatic organisms.

#### Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 7/9 Keep container tightly closed and in a well-ventilated place.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

### WGK (Water Danger/Protection)

CAS# 7726-95-6: 3

### Canada - DSL/NDSL

CAS# 7726-95-6 is listed on Canada's DSL List.

### Canada - WHMIS

This product has a WHMIS classification of C, D1A, E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

### Canadian Ingredient Disclosure List

CAS# 7726-95-6 is listed on the Canadian Ingredient Disclosure List.

## Section 16 - Additional Information

**MSDS Creation Date:** 9/02/1997

**Revision #8 Date:** 10/11/2006

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.*