

## MATERIAL SAFETY DATA SHEET

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Version 1.4

## Section 1 - Product and Company Information

Product Name 2-BROMO-2-CHLORO-1,1,1-TRIFLUOROETHANE  
Product Number B4388  
Brand SIGMA  
Company Sigma-Aldrich  
Street Address 3050 Spruce Street  
City, State, Zip, Country SAINT LOUIS MO 63103 US  
Technical Phone: 314 771 5765  
Emergency Phone: 414 273 3850 Ext. 5996  
Fax: 800 325 5052

## Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
2-BROMO-2-CHLORO-1,1,1-TRIFLUOROETHANE	151-67-7	No

Formula C2HBrClF3  
Synonyms Bromochlorotrifluoroethane \*  
1-Bromo-1-chloro-2,2,2-trifluoroethane \*  
2-Bromo-2-chloro-1,1,1-trifluoroethane \*  
Chalothane \* Ethane,  
1-bromo-1-chloro-2,2,2-trifluoro- \* Fluorotane \*  
Fluothane \* Ftorotan (Russian) \* Halotan \*  
Halothane (ACGIH) \* Halsan \* Narcotane \*  
Narcotann NE-spofo (Russian) \*  
1,1,1-Trifluoro-2-bromo-2-chloroethane \*  
1,1,1-Trifluoro-2-chloro-2-bromoethane \*  
2,2,2-Trifluoro-1-chloro-1-bromoethane  
RTECS Number: KH6550000

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Toxic.

May cause harm to the unborn child. Risk of serious damage to eyes. Irritating to respiratory system and skin.

Target organ(s): Central nervous system. Cardiovascular system. Kidneys. Liver.

## HMIS RATING

HEALTH: 2\*

FLAMMABILITY: 0

REACTIVITY: 1

## NFPA RATING

HEALTH: 2

FLAMMABILITY: 0

REACTIVITY: 1

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

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#### Section 4 - First Aid Measures

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##### ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

##### INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

##### DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

##### EYE EXPOSURE

In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

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#### Section 5 - Fire Fighting Measures

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##### FLASH POINT

N/A

##### AUTOIGNITION TEMP

N/A

##### FLAMMABILITY

N/A

##### EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

##### FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.  
Specific Hazard(s): Emits toxic fumes under fire conditions.

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#### Section 6 - Accidental Release Measures

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##### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

##### METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

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#### Section 7 - Handling and Storage

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##### HANDLING

User Exposure: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

##### STORAGE

Suitable: Keep tightly closed.



Miscellaneous Data            N/A  
Solubility                    N/A

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

Conditions of Instability: May decompose on exposure to light.

Materials to Avoid: Strong oxidizing agents, Rubber, Plastics, Chemically active metals.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Hydrogen chloride gas, Hydrogen bromide gas, Hydrogen fluoride.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## Section 11 - Toxicological Information

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### ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes severe eye irritation.

Inhalation: Material is irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

### TARGET ORGAN(S) OR SYSTEM(S)

Kidneys. Liver. Central nervous system. Cardiovascular system.

### SIGNS AND SYMPTOMS OF EXPOSURE

Causes a fall in blood pressure. Exposure can cause: Narcotic effect. Dizziness. Drowsiness. Confusion. Unconsciousness.

### TOXICITY DATA

Oral

Rat

6,700 mg/kg

LD50

Inhalation

Human

7,000 ppm

LCLO

Remarks: Liver:Hepatitis (hepatocellular necrosis), diffuse.

Gastrointestinal:Nausea or vomiting. Nutritional and Gross

Metabolic:Changes in:Body temperature increase.

Intravenous

Man

129 MG/KG

LDLO

Remarks: Behavioral:General anesthetic. Cardiac: Change in rate.

Lungs, Thorax, or Respiration:Cyanosis.

Oral

Rat

5680 mg/kg

LD50

Remarks: Behavioral:Excitement. Behavioral:Antipsychotic.

Inhalation  
Rat  
29,000 ppm  
LC50

Inhalation  
Mouse  
98,000 mg/m3  
LC50  
Remarks: Brain and Coverings:Other degenerative changes.  
Liver:Other changes. Kidney, Ureter, Bladder:Other changes.

Oral  
Guinea pig  
6000 mg/kg  
LD50  
Remarks: Behavioral:Excitement. Behavioral:Antipsychotic.

#### IRRITATION DATA

Eyes  
Rabbit  
100 mg  
Remarks: Severe irritation effect

#### CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

#### ACGIH CARCINOGEN LIST

Rating: A4

#### CHRONIC EXPOSURE - TERATOGEN

Species: Mouse  
Dose: 500 ppm/4H 500 ppm/4HR  
Route of Application: Inhalation  
Exposure Time: Daily 9 weeks  
Species: Mouse  
Dose: 500 ppm/ 2H 500 ppm/ 2HR  
Route of Application: Inhalation  
Exposure Time: Daily 9 weeks  
Species: Mouse  
Dose: 1000 ppm/4HR 1000 ppm/4H  
Route of Application: Inhalation  
Exposure Time: Daily 9 weeks

Species: Rat  
Dose: 8000 PPM/12H  
Route of Application: Inhalation  
Exposure Time: (9D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat  
Dose: 1600 PPM/8H  
Route of Application: Inhalation  
Exposure Time: (1-21D PREG)

Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat

Dose: 10 PPM/8H

Route of Application: Inhalation

Exposure Time: (1-22D PREG)

Result: Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material). Specific Developmental Abnormalities: Central nervous system.

Species: Rat

Dose: 10 PPM/8H

Route of Application: Inhalation

Exposure Time: (1-22D PREG)

Result: Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material). Specific Developmental Abnormalities: Urogenital system.

Species: Mouse

Dose: 1 PPH/3H

Route of Application: Inhalation

Exposure Time: (13D PREG)

Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue). Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Other developmental abnormalities.

Species: Mouse

Dose: 3000 PPM/4H

Route of Application: Inhalation

Exposure Time: (9W PRE/1-17D PREG)

Result: Specific Developmental Abnormalities: Urogenital system.

#### CHRONIC EXPOSURE - MUTAGEN

Species: Human

Dose: 1 PPH/48H-C

Cell Type: lymphocyte

Mutation test: Cytogenetic analysis

Species: Rat

Route: Oral

Dose: 4 MMOL/KG

Mutation test: Micronucleus test

Species: Rat

Route: Inhalation

Dose: 1000 PPM

Exposure Time: 2H

Mutation test: Unscheduled DNA synthesis

Species: Rat

Route: Oral

Dose: 10 GM/KG

Mutation test: Unscheduled DNA synthesis

Species: Mouse

Route: Inhalation

Dose: 1 PPH/1H

Mutation test: Other mutation test systems

Species: Mouse  
Route: Inhalation  
Dose: 8000 PPM  
Exposure Time: 24H  
Mutation test: DNA inhibition

Species: Mouse  
Dose: 1000 PPM  
Cell Type: fibroblast  
Mutation test: Cytogenetic analysis

Species: Hamster  
Dose: 1 PPH  
Cell Type: fibroblast  
Mutation test: Other mutation test systems

Species: Hamster  
Dose: 1 PPH/48H-C  
Cell Type: lung  
Mutation test: Cytogenetic analysis

Species: Chicken  
Route: Parenteral  
Dose: 10 MG  
Mutation test: Cytogenetic analysis

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat  
Dose: 100 PPM/8H  
Route of Application: Inhalation  
Exposure Time: (2-22D PREG/30D POST)  
Result: Effects on Newborn: Behavioral.

Species: Rat  
Dose: 8000 PPM/6H  
Route of Application: Inhalation  
Exposure Time: (7-9D PREG)  
Result: Effects on Fertility: Abortion.

Species: Mouse  
Dose: 3000 PPM/4H  
Route of Application: Inhalation  
Exposure Time: (9W PRE/1-21D PREG)  
Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth). Effects on Fertility: Other measures of fertility

Species: Mouse  
Dose: 1000 PPM/4H  
Route of Application: Inhalation  
Exposure Time: (9W PRE/1-21D PREG)  
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Species: Mouse  
Dose: 14000 PPM/1H  
Route of Application: Inhalation  
Exposure Time: (8-10D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse  
Dose: 15000 PPM/40M  
Route of Application: Inhalation  
Exposure Time: (3W PRE)  
Result: Maternal Effects: Other effects. Effects on Newborn:  
Weaning or lactation index (e.g., # alive at weaning per # alive  
at day 4). Effects on Newborn: Other postnatal measures or  
effects.

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## Section 12 - Ecological Information

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No data available.

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## Section 13 - Disposal Considerations

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### APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

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## Section 14 - Transport Information

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### DOT

Proper Shipping Name: Aviation Regulated Liquid, N.O.S.  
UN#: 3334  
Class: 9  
Packing Group: Packing Group III  
Hazard Label: Class 9  
PIH: Not PIH

### IATA

Proper Shipping Name: Aviation Regulated Liquid, N.O.S.  
IATA UN Number: 3334  
Hazard Class: 9

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## Section 15 - Regulatory Information

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### EU ADDITIONAL CLASSIFICATION

Symbol of Danger: T  
Indication of Danger: Toxic.  
R: 61 41 37/38  
Risk Statements: May cause harm to the unborn child. Risk of serious damage to eyes. Irritating to respiratory system and skin.  
S: 53 23 26 36/37 45  
Safety Statements: Avoid exposure - obtain special instructions before use. Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

### US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Toxic.  
Risk Statements: May cause harm to the unborn child. Risk of serious damage to eyes. Irritating to respiratory system and skin.  
Safety Statements: Do not breathe vapor. Wear suitable protective clothing. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.



US Statements: Target organ(s): Central nervous system.  
Cardiovascular system. Kidneys. Liver.

UNITED STATES REGULATORY INFORMATION  
SARA LISTED: No

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65

California Prop - 65: This product is or contains chemical(s)  
known to the state of California to cause developmental toxicity.

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in  
accordance with the hazard criteria of the CPR, and the MSDS  
contains all the information required by the CPR.

DSL: No

NDSL: No

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Section 16 - Other Information

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DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not  
purport to be all inclusive and shall be used only as a guide. The  
information in this document is based on the present state of our  
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