SAFETY DATA SHEET

Bromine Trifluoride

Section 1. Identification

GHS product identifier : Bromine Trifluoride
Chemical Name : Bromine Trifluoride
Other means of identification : BrF3; Bromine fluoride; Bromine fluoride (BrF3); UN 1746
Product Use : Synthetic/Analytical chemistry
Synonym : BrF3; Bromine fluoride; Bromine fluoride (BrF3); UN 1746
SDS # : N/A
Supplier's details : **Daniel Oilfield Tools, INC.**
7676 North Freeway
Ste 600
Houston, TX. 77037
(713) 459 2550
Emergency telephone number (with hours of operation) : **(713) 459 2550 (8AM-11PM)**

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)
Classification of the substance or mixture : OXIDIZING LIQUIDS - Category 1
SKIN CORROSION/IRRITATION - Category 1
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3

GHS label elements
Hazard pictograms :

Signal word : Danger.
Hazard statements : May displace oxygen and cause rapid suffocation.
May cause fire or explosion; strong oxidizer.
Causes severe skin burns and eye damage.
Corrosive to respiratory tract.
Precautionary statements : Prevention : Wear fire resistant clothing. Wear protective gloves. Wear eye or

General

face protection.
Wear protective clothing. Keep away from heat. - No smoking. Keep away from clothing, incompatible materials and combustible materials. Take any precaution to avoid mixing with combustibles and other incompatible materials.Use only Outdoors or in a well-ventilated areas.Avoid breathing vapor. Wash hands thoroughly after handling.

Section 2. Hazards identification

Response : In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. **DO NOT** induce vomiting. **IF ON SKIN** (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a **POISON CENTER** or physician. IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Protect from moisture. Keep container tightly closed.Keep away from heat,sparks,open flames and hot surfaces. - No smoking. Use only with adequate ventilation.

Hazards not otherwise classified : Water reactive. Reacts with water to release toxic gas. May be fatal if inhaled.

Section 3. Composition/information on ingredients

Substance/mixture : Substance.

Chemical name : bromine trifluoride

Other means of identification : BrF3; Bromine Fluoride; Bromine Fluoride (BrF3); UN 1746

CAS number/other identifiers

CAS number : 7787-71-5

Product code : 001112

INGREDIENT NAME	%	CAS NUMBER
BROMINE TRIFLUORIDE	**100**	**7787-71-5**

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.
Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids.Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Section 4. First aid measures

Skin Contact : Get medical attention immediately. Call a poison center or physician. Rinse immediately contaminated clothing and skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : May cause respiratory irritation. Ingestion : May cause burns to mouth, throat and stomach.

Skin contact : Causes severe burns.

FrostBite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye Contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
Coughing

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical or CO_2.

Unsuitable extinguishing media : Do not use water or foam.

Specific hazards arising from the chemical : Strongly oxidizing material. Contact with water liberates toxic gas. May cause fire or explosion. In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Decomposition products may include the following materials halogenated compounds

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipmentfor fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency Personnel : No action shall be taken involving any personal risk or without Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources.No flares, smoking or flames in hazard area. Keep away from water. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Avoid allowing the spilled material to get wet or using water to clean up spillages or residues, unless the quantity remaining is very small. Do not absorb in sawdust or other combustible material. It may lead to a fire risk when it dries out. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Do not absorb in sawdust or other combustible material. It may lead to a fire risk when it dries out. Avoid allowing the spilled material to get wet or using water to clean up spillages or residues, unless the quantity remaining is very small. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

NONE

Appropriate engineering controls : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Engineering controls may be required to control the primary or secondary risks associated with this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid

Color : Yellow or Gray

Molecular weight : 136.9 g/mole

Molecular formula : Br-F3

Boiling/condensation point : 127°C (260.6°F)

Melting/freezing point : 8.77°C (47.8°F)

Critical temperature : >20°C (>68°F)

Odor	: Obnoxious.
Odor threshold	: Not available.
pH	: Not available.
Flash point	: Not available.
Burning time	: Not applicable.
Burning rate	: Not applicable.
Evaporation rate	: Not available.
Flammability (solid, gas)	: Not available.
Lower and upper explosive (flammable) limits	: Not available.
Vapor pressure	: Not available.
Vapor density	: Not available
Specific Volume (ft 3 /lb)	: Not applicable
Gas Density (lb/ft 3)	: Not available.
Relative density	: 4.7
Solubility	: Not Available
Solubility in water	: Not Available
Partition coefficient n-octanol/water	: Not Available
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.

Section 9. Physical and chemical properties

SADT	: Not available.
Viscosity	: Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Hazardous reactions or instability may occur under certain conditions of storage or use.
Conditions may include the following:
contact with combustible materials
contact with water
Reactions may include the following:
risk of explosion
liberation of toxic gas

Conditions to avoid : Drying on clothing or other combustible materials may cause fire.

Incompatibility with various Substances : Highly reactive or incompatible with the following materials: combustible materials and metals.

Hazardous decomposition Products : Contact with water liberates toxic gas.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Section 11. Toxicological information

NAME	CATEGORY	ROUTE OF EXPOSURE	TARGET ORGANS
BROMINE TRIFLUORIDE	CATEGORY 3	NOT APPLICABLE	RESPIRATORY TRACT IRRITATION

Specific target organ toxicity (repeated exposure)

Not available

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye Contact : May cause serious eye damage

Inhalation : May cause respiratory irritation.

Ingestion : May cause burns to mouth, throat and stomach.

Skin contact : Causes severe burns.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.

Section 11. Toxicological information

Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity
Acute toxicity estimates
Not available.

Section 12. Ecological information

Toxicity
Not available

Persistence and degradability
Not available

Bioaccumulative potential
Not available.

Mobility in soil
Soil/water partition coefficient (KOC) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods :The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT	TDG	MEXICO	IMDG	IATA
UN NUMBER	UN 1746	UN 1746	UN 1746	UN 1746	UN 1746

UN proper shipping name	**BROMINE TRIFLUORIDE**	**BROMINE TRIFLUORIDE**	**BROMINE TRIFLUORIDE**	**BROMINE TRIFLUORIDE**	**BROMINE TRIFLUORIDE**

Section 14. Transport information

TRANSPORT HAZARD CLASS	5.1, (6.1,8) 	5.1, (6.1,8) 	5.1, (6.1,8) 	5.1, (6.1,8) 	5.1, (6.1,8) 
PACKAGING GROUP	I	I	I	I	I
ENVIRONMENT	NO	NO	NO	NO	NO
ADDITIONAL INFORMATION	Inhalation hazard **zone A** Limited quantity **Yes.** Packaging instruction Passenger aircraft Quantity limitation: **Forbidden.** Cargo aircraft Quantity limitation: **Forbidden.** Special provisions **2, B9, B14, B32, B74**	Explosive Limit and Limited Quantity Index **0** ERAP Index **1000** Passenger Carrying Ship Index **Forbidden** Passenger Carrying Road or Rail Index **Forbidden**			Passenger and Cargo Aircraft Quantity limitation: Forbidden Cargo Aircraft Only Quantity limitation: Forbidden

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

US federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption: Not determined United States inventory (TSCA 8b):** This material is listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed
Clean Air Act Section 602 Class I Substances : Not listed
Clean Air Act Section 602 Class II Substances : Not listed
DEA List I Chemicals (Precursor Chemicals) : Not listed
DEA List II Chemicals (Essential Chemicals) : Not listed

Section 15. Regulatory information

SARA 302/304
Composition/information on ingredients
No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312
Classification : Fire hazard
Reactive
Immediate (acute) health hazard

Composition/information on ingredients

NAME	%	FIRE HAZARD	SUDDEN RELEASE OF PRESSURE	REACTIVE	IMMEDIATE (ACUTE) HEALTH HAZARD	DELAYED (CHRONIC) HEALTH HAZARD
BROMINE TRIFLUORIDE	100	YES	NO	YES	YES	NO

State Regulations

Massachusetts : This material is listed.
New York : This material is not listed.
New Jersey : This material is listed.
Pennsylvania : This material is listed.

Canada inventory : This material is not listed in DSL but is listed in NDSL.

International regulations
International lists : **Australia inventory (AICS)** : This material is listed or exempted.
China inventory (IECSC) : Not determined.
Japan inventory : Not determined.
Korea inventory : This material is listed or exempted.
Malaysia Inventory (EHS Register) : Not determined.
New Zealand Inventory of Chemicals (NZIoC): Not determined.
Philippines inventory (PICCS) : This material is listed or exempted.
Taiwan inventory (CSNN) : Not determined.

Chemical Weapons Convention List Schedule I Chemicals : Not listed
Chemical Weapons Convention List Schedule II Chemicals : Not listed
Chemical Weapons Convention List Schedule III Chemicals : Not listed

Canada
WHMIS (Canada) Class C: Oxidizing material.
Class E: Corrosive material

CEPA Toxic substances : This material is not listed.

Canadian ARET : This material is not listed.
Canadian NPRI : This material is not listed.
Alberta Designated Substances : This material is not listed.
Ontario Designated Substances : This material is not listed.
Quebec Designated Substances : This material is not listed.

Section 16. Other information

Canada Label requirements : Class C: Oxidizing material.
Class E: Corrosive material

Hazardous Material Information System (U.S.A.)

HEALTH	**3**
FLAMMABILITY	**0**
PHYSICAL HAZARDS	**3**

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868. The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Health Special Instability/Reactivity Flammability

History

Date of printing : 01/09/2018
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Version
Date of previous issue : 06/09/2018

Key to abbreviations :**ATE = Acute Toxicity Estimate**
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United NationsACGIH – American Conference of Governmental Industrial Hygienists
AIHA – American Industrial Hygiene Association
CAS – Chemical Abstract Services CEPA – Canadian Environmental Protection
Act CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act (EPA)
CFR – United States Code of Federal Regulations

Section 16. Other information

CPR – Controlled Products Regulations
DSL – Domestic Substances List
GWP – Global Warming Potential
IARC – International Agency for Research on Cancer
ICAO – International Civil Aviation Organisation
Inh – Inhalation
LC – Lethal concentration
LD – Lethal dosage
NDSL – Non-Domestic Substances List
NIOSH – National Institute for Occupational Safety and Health
TDG – Canadian Transportation of Dangerous Goods Act and Regulations
TLV – Threshold Limit Value
TSCA – Toxic Substances Control Act
WEEL – Workplace Environmental Exposure Level
WHMIS – Canadian Workplace Hazardous Material Information System

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.