MATERIAL SAFETY DATA SHEET
PRODUCT - BROMINE TRIFLUORIDE

SUPPLIER:
DANIEL OILFIELD TOOLS
7676 North Freeway
Suite 600
Houston, Texas, USA
713-459-2550

CAS #: 7787-71-5
EMERGENCY PHONE:
1-800-255-3924

HEALTH HAZARD DATA

PRODUCT IDENTIFICATION
TRADE NAME AND SYNONYMS: Bromine Trifluoride, Chemical cylinder, UN1746 Class 5.1, Packing Group I
CHEMICAL NAME AND SYNONYMS: Bromine Trifluoride
FORMULA: BrF3 CHEMICAL FAMILY: Halogen Fluoride
TIME WEIGHTED AVERAGE EXPOSURE LIMIT: See last page
SYMPTOMS OF EXPOSURE:
Corrosive and extremely irritating to the upper and lower respiratory tracts, skin, and eyes. BrF3 hydrolyzes to form hydrofluoric acid, therefore skin burns and mucous membrane irritation are similar to those caused by the acid. Symptoms include tearing of the eyes, cough, difficult breathing, abnormal fluids formation in the nose, mouth and throat. Inhalation of BrF3 may cause pneumonitis (deep lung inflammation) and pulmonary edema (abnormal fluid buildup in the lungs) which can be fatal. Symptoms of hydrofluoric acid burns are severe pain, redness, possible swelling and tissue destruction.

TOXICOLOGICAL PROPERTIES:
Bromine Trifluoride is irritating and corrosive to all living tissues. Toxic level exposure to skin tissue causes hydrofluoric acid burns and skin lesions resulting in tissue destruction and eventual scarring. Burn activity continues while any residual active fluorides remain. Chemical pneumonitis and pulmonary edema result from exposure to the lower respiratory tract and deep lung. Residual pulmonary malfunction might also occur. Burns of the eye result in lesions and possible loss of vision. Extended low level systemic absorption of fluorides may cause fluorosis, an abnormal calcium accumulation in the bone structure.

RECOMMENDED FIRST AID TREATMENT:
PROMPT MEDICAL ATTENTION IS REQUIRED IN ALL CASES OF OVEREXPOSURE. BROMINE TRIFLUORIDE RESCUE PERSONNEL SHOULD BE EQUIPPED WITH APPROPRIATE PROTECTIVE EQUIPMENT (SELF-CONTAINED BREATHING APPARATUS, ETC.) TO PREVENT UNNECESSARY EXPOSURE.
Inhalation: Move exposed personnel to an uncontaminated area. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Keep victim warm and quiet. Assure that mucus or vomited material does not obstruct the airway by use of positional drainage. Delayed pulmonary edema may occur. Keep patient under medical observation for at least 24 hours.
Eye Contact: PERSONS WITH POTENTIAL EXPOSURE TO BROMINE TRIFLUORIDE SHOULD NOT WEAR CONTACT LENSES. Flush contaminated eye(s) with large quantities of water. Hold eyelids open with fingers to assure complete flushing. Continue for minimum of 30 minutes.
Skin Contact: Flush affected area with large quantities of water. Remove affected clothing as rapidly as possible. Skin burns may be treated with a calcium gluconate gel or slurry in water or glycerin. This compound binds the active fluorides in an insoluble form and limits burn extension and relieves pain.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES:
Bromine Trifluoride is a very reactive halogen fluoride. It reacts with virtually all organic and most inorganic substances. Some of the perfluorinated organic substances in their pure form will not be oxidized by Bromine Trifluoride. It reacts violently with water or fuels.

PHYSICAL DATA
BOILING POINT: 258.4°F (125.8°C) LIQUID DENSITY AT BOILING: 157.2 lb/ft 3 (2513KG/M 3)
VAPOR PRESSURE: @70°F (21.1°C) 0.145psia (1.0 kPa) GAS DENSITY AT 79°F 1 atm : Liquid
SOLUBILITY IN WATER: Reacts violently FREEZING POINT: 47.8°F (8.8°C)
APPEARANCE AND ODOR: Colorless, fuming liquid with a choking, pungent odor.
## FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point (Method used)</td>
<td>N/A</td>
</tr>
<tr>
<td>Auto Ignition Temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>Flammable Limits % by Volume</td>
<td>LEL</td>
</tr>
<tr>
<td></td>
<td>UEL</td>
</tr>
<tr>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Nonflammable</td>
</tr>
<tr>
<td>Electrical Classification</td>
<td>Nonhazardous</td>
</tr>
</tbody>
</table>

**SPECIAL FIRE FIGHTING PROCEDURES:** Fires with bromine Trifluoride as the oxidizer can only be extinguished by shutting off the source of bromine trifluoride. Do not use water, chemical, carbon dioxide or other extinguishing media as these will only add more fuel to the fire.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Reacts violently or explodes on contact with water or organic materials. Combustion products, including hydrogen fluoride, are toxic and reactive.

**STABILITY:** Stable ✗ Unstable

**CONDITIONS TO AVOID:**
React violently or explodes on contact with water and organic materials.

**INCOMPATIBILITY (Material to avoid):**
Water, plastics, hydrocarbons, other organic materials.

**HAZARDOUS DECOMPOSITION PRODUCTS:**
Bromine, fluorine, bromine monofluoride; hydrogen fluoride in reactions

**HAZARDOUS POLYMERIZATION:**

**CONDITIONS TO AVOID:**
May Occur ✗ Will Not Occur

## SPILL OR LEAK PROCEDURES

**STEPS TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:**
Evacuate all personnel from affected area. Use appropriate protective equipment. Call company technical supervisor or Daniel Oilfield Tools phone number 713-459-2550.

**WASTE DISPOSAL METHOD:**
All Federal, State and Local Regulations regarding health and pollution should be followed in waste disposal. Contact Daniel Oilfield Tools for specific recommendations. Do not dispose of unused quantities. Contact Tech Manager or Daniel Oilfield Tools for instructions.

## SPECIAL PROTECTION INFORMATION

**RESPIRATORY PROTECTION (Specify type):**
Full face piece cartridge respirator, positive pressure air line or self breathing apparatus.

**VENTILATION:**
INDOOR - Hood with forced ventilation    OUTDOOR - Open area, none required

**PROTECTIVE GLOVES:** Neoprene Rubber

**EYE PROTECTION:** Full face piece respirator

**OTHER PROTECTIVE EQUIPMENT:**
Safety shoes, eyewash and acid resistant over garments.

## SPECIAL PRECAUTIONS*

**SPECIAL LABELING INFORMATION:**
D.O.T. Shipping Name: Bromine Trifluoride D.O.T. Shipping Class: Oxidizer I.D. No.: UN 1746

**SPECIAL HANDLING RECOMMENDATIONS:**
Use in only well-ventilated areas. Do not drag, slide or roll cylinder.

**SPECIAL STORAGE RECOMMENDATIONS:**
Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 130°F (54°C). Full cylinders should be segregated. Use a "first-in-first-out" inventory system.

**TIME WEIGHTED AVERAGE EXPOSURE LIMIT:**
None established (ACGIH 1984-85). Observation of the exposure limits for hydrogen fluoride, which forms when BrF3 is hydrolyzed, is recommended.

The TWA for HF is 3 molar ppm; the STEL is 6 molar ppm (ACGIH 1984-85)

Note: ACGIH (1984-85) has proposed adoption of a ceiling value of 3 molar for HF.

Local Exhaust: To prevent accumulation above the TWA for hydrogen fluoride

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.