

**CHAMMAS CUTTERS, INC.**

# SAFETY DATA SHEET

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## Section 1. Identification

**Product name** : IGNITER (BP1/BP3/BP4)  
**Product code** : 068017 (small BP1), 137017 (regular BP3/BP4), 137027 (long BP4)

### Relevant identified uses of the substance or mixture and uses advised against

**Identified uses** : Oilfield Operations

**Issue date** : 6/18/2015

**Revision date** : 10/30/18

**Supplier's details** : Chammas Cutters, Inc.  
11320 FM 529, Bldg I  
Houston, TX 77041

**Emergency telephone number (with hours of operation)** : CHEMTEL: 1-800-255-3924 or International +01-813-248-0585, 24 Hours (Contract no. MIS0000161)

## 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** : EXPLOSIVES - Division 1.4

### GHS label elements

**Hazard pictograms** :



**Signal word** : Warning

**Hazard statements** : Fire or projection hazard.

### Precautionary statements

**Prevention** : Wear face protection. Do not subject to grinding, shock, friction or any rough handling. Keep away from heat, sparks, open flames and hot surfaces. - No smoking.

**Response** : Explosion risk in case of fire. In case of fire: Evacuate area. DO NOT fight fire when fire reaches explosives.

**Storage** : Store in accordance with all local, regional, national and international regulations.

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

**Hazards not otherwise classified** : None known.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Mixture

<b>Ingredient name</b>	<b>Weight %</b>	<b>CAS number</b>
Charcoal	8-18%	16291-96-6
Sulfur	9-20%	7704-34-9
Potassium Nitrate	70-76%	7757-79-1
Graphite (note: not contained in all grades of black powder)	<1%	7782-42-5

## Section 4. First aid measures

### Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 10 minutes. Check for and remove any contact lenses. Get medical attention if irritation occurs.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. Get medical attention if adverse health effects persist or are severe. 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.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : 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. Get medical attention if adverse health effects persist or are severe. 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** : No known significant effects or critical hazards.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : No specific data.
- Ingestion** : No specific data.

### 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. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

## Section 4. First aid measures

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.
- Specific hazards arising from the chemical** : Explosive material with fire or projection hazard. Runoff to sewer may create fire or explosion hazard.
- Hazardous thermal decomposition products** : No specific data.
- 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. First move people out of line-of-sight of the scene and away from windows. 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. Fight fire from protected location or maximum possible distance. Do not fight fire when it reaches the material. Withdraw from fire and let it burn.
- Special protective equipment for 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. Fire-fighters' protective clothing will only provide limited protection.
- Remark** :
- Remark** : Explosive Temperature 427°C (801°F) Explosive material with fire or projection hazard.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : Accidental releases pose a serious fire or explosion hazard. Immediately contact emergency personnel. No action shall be taken involving any personal risk or without suitable training. 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. 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** : Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

## Section 6. Accidental release measures

- Large spill** : Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Dike spill area and do not allow product to reach sewage system or surface or ground water. Notify any reportable spill to authorities. (See section 12 for environmental risks and 13 for disposal information.) Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid shock and friction. Use only with adequate ventilation. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

### Additional information

Explosive material with fire or projection hazard.

## Section 8. Exposure controls/personal protection

### Control parameters

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredients:	List name	ppm	mg/m <sup>3</sup>	Other	ppm	mg/m <sup>3</sup>	Other	ppm	mg/m <sup>3</sup>	Other	Notations
No exposure limit value known.											

Consult local authorities for acceptable exposure limits.

Only components of this product with established exposure limits appear in the box above.

If OSHA permissible exposure levels are shown above they are the OSHA 1989 levels or are from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Hughes recommends that these lower exposure levels be observed as reasonable worker protection.

- Appropriate engineering controls** : Engineering controls may be required to control the primary or secondary risks associated with this product. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Use explosion-proof ventilation equipment.

### Individual protection measures

## Section 8. Exposure controls/personal protection

- 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** : Wear chemical safety goggles. When transferring material wear face-shield in addition to chemical safety goggles.
- Hand protection** : Chemical-resistant gloves.
- Skin protection** : Wear long sleeves to prevent repeated or prolonged skin contact.
- Respiratory protection** : Use a properly fitted, particulate filter 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** : Solid. [Silver color case. Over all lengths 068017(1.08"), 137017(1.26"), 137027(1.38") , sealed with black RTV silicone]
- Color** : Silver.
- Odor** : Odorless.
- Odor threshold** : Not available.
- pH** : Not available.
- Melting/freezing point** : Not available.
- Boiling point** : Not available.
- Initial Boiling Point** : Not available.
- Flash point** : Not available.
- Burning time** : Not available.
- Burning rate** : Not available.
- Evaporation rate** : Not available.
- Flammability (solid, gas)** :
- Lower and upper explosive (flammable) limits** : Not available.
- Vapor pressure** : Not available.
- Vapor density** : Not available.
- Relative density** : Not available.
- Density** : Not available.
- Solubility in water** : Not available.
- Partition coefficient: n-octanol/water** : Not available.
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : Not available.
- Viscosity** : Not available.
- VOC** : Not available.
- Pour Point** : Not available.

## Section 10. Stability and reactivity

- Reactivity** : This product presents only a small hazard in the event of ignition or initiation; the effects largely being confined to the package with no expected projection of fragments of appreciable size or range.
- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Conditions to avoid** : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Avoid shock and friction.
- Incompatible materials** : Extremely reactive or incompatible with the following materials: metals and acids.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

No applicable toxicity data

#### Irritation/Corrosion

No applicable toxicity data

#### Sensitization

No applicable toxicity data

#### Mutagenicity

No applicable toxicity data

#### Carcinogenicity

No applicable toxicity data

#### Reproductive toxicity

No applicable toxicity data

#### Teratogenicity

No applicable toxicity data

#### Specific target organ toxicity (single exposure)

Not applicable.

#### Specific target organ toxicity (repeated exposure)

Not applicable.

#### Aspiration hazard

Not available.

- Information on the likely routes of exposure** : Not available.

## Section 11. Toxicological information

### 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.

#### Potential chronic health effects

**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.

**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

No applicable toxicity data





### Persistence and degradability

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.

<b>Section 14. Transport information</b>				
	<b>DOT Classification</b>	<b>TDG Classification</b>	<b>IMDG</b>	<b>IATA</b>
<b>UN number</b>	UN0454	UN0454	UN0454	UN0454
<b>UN proper shipping name</b>	IGNITERS	IGNITERS	IGNITERS	IGNITERS
<b>Transport hazard class(es)</b>	1.4S 	1.4S 	1.4S 	1.4S 
<b>Packing group</b>	II	II	II	II
<b>Environmental hazards</b>	No.	No.	No.	No.
<b>Additional information</b>	(Packaged 20 units max. per box w/dividers separating each unit)	-	-	-

**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.

**DOT Reportable Quantity** : Not applicable.

**Marine pollutant** : Not available.

**North-America NAERG** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** :

- TSCA 12(b) one-time export:** No products were found.
- TSCA 12(b) annual export notification:** No products were found.
- United States inventory (TSCA 8b):** Not determined.
- Clean Water Act (CWA) 307:** No products were found.
- Clean Water Act (CWA) 311:** No products were found.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Not listed

**SARA 302/304** : No products were found.

**SARA 311/312**

**Classification** : Sudden release of pressure

**SARA 313**

**Supplier notification** : No products were found.

**Canada**



## Section 15. Regulatory information

Canada (CEPA DSL): : Not determined.

## Section 16. Other information

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

Health	0
Flammability	2
Physical hazards	0
Personal protection	C

The customer is responsible for determining the PPE code for this material.

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



### History

Date of printing : 06/18/2015.

Indicates information that has changed from previously issued version.

### Notice to reader

NOTE: The information on this SDS is based on data which is considered to be accurate. Chammas Cutters, Inc, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This SDS was prepared and is to be used for this product. If the product is used as a component in another product, this SDS information may not be applicable.

## SECTION 1: IDENTIFICATION

### 1.1. Product Identifier

**Product Form:** Mixture

**Product Name:** TP-J-3006 Propellant and/or Propellant Sticks

**SDS No.:** 098L

**Synonyms:** This SDS covers all forms of TP-J-3006 including TP-J-3006 Propellant Sticks with the following physical characteristics:

Diameter (inches)	Length (inches)	Wt/Stick (grams)
3/4 max.	16 max.	191.0 max.

**Note:** This product contains hazardous substances, which under normal conditions of use are not in contact with the user unless the article is split open or intentionally disassembled prior to ignition. This Safety Data Sheet applies to the explosive properties of the product and specifically the hazardous substances encased within it.

### 1.2. Intended Use of the Product

**Use of the Substance/Mixture:** Propellant

### 1.3. Name, Address, and Telephone of the Responsible Party

**Company**

Alliant Techsystems Operations LLC

55 Thiokol Road

Elkton, MD 21921

Tel 410-392-1000

Fax 410-392-1592

### 1.4. Emergency Telephone Number

**Emergency Number** : CHEMTREC: 800-424-9300

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1. Classification of the Substance or Mixture

**GHS-US Classification**

Expl. 1.4	H204
Ox. Sol. 1	H271
Skin Irrit. 2	H315
Eye Irrit. 2A	H319
Skin Sens. 1	H317
Repr. 1B	H360
STOT RE 2	H373
Aquatic Acute 2	H401
Aquatic Chronic 3	H412

Full text of hazard classes and H-statements : see section 16

### 2.2. Label Elements

**GHS-US Labeling**

**Hazard Pictograms (GHS-US)**



**Signal Word (GHS-US)**

: Danger

**Hazard Statements (GHS-US)**

- : H204 - Fire or projection hazard.
- H271 - May cause fire or explosion; strong oxidizer.
- H315 - Causes skin irritation.
- H317 - May cause an allergic skin reaction.
- H319 - Causes serious eye irritation.
- H360 - May damage fertility or the unborn child.
- H373 - May cause damage to organs through prolonged or repeated exposure.

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### Precautionary Statements (GHS-US)

- H401 - Toxic to aquatic life.
- H412 - Harmful to aquatic life with long lasting effects.
- P201 - Obtain special instructions before use.
- P202 - Do not handle until all safety precautions have been read and understood.
- P210 - Keep away from extremely high or low temperatures, ignition sources, and incompatible materials. - No smoking.
- P220 - Keep/Store away from combustible material, oxidizable materials, and incompatible materials.
- P221 - Take any precaution to avoid mixing with combustible material, oxidizable materials, and incompatible materials.
- P240 - Ground/bond container and receiving equipment.
- P250 - Do not subject to grinding/shock/friction.
- P260 - Do not breathe dust, fume.
- P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
- P272 - Contaminated work clothing must not be allowed out of the workplace.
- P273 - Avoid release to the environment.
- P280 - Wear protective gloves, protective clothing, and eye protection.
- P283 - Wear fire/flammable resistant/retardant clothing.
- P302+P352 - If on skin: Wash with plenty of water.
- P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P306+P360 - If on clothing: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.
- P308+P313 - If exposed or concerned: Get medical advice/attention.
- P314 - Get medical advice/attention if you feel unwell.
- P321 - Specific treatment (see section 4 on this SDS).
- P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
- P337+P313 - If eye irritation persists: Get medical advice/attention.
- P362+P364 - Take off contaminated clothing and wash it before reuse.
- P370+P378 - In case of fire: Use appropriate media (see section 5) to extinguish.
- P370+P380 - In case of fire: Evacuate area.
- P374 - Fight fire with normal precautions from a reasonable distance.
- P401 - Store in accordance with the provisions of the Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR part 555.
- P405 - Store locked up.
- P501 - Dispose of contents/container in accordance with the provisions of the Bureau of Alcohol, Tobacco and Firearms regulations contained in 27 CFR part 555.

### 2.3. Other Hazards

Ingestion may cause methemoglobinemia. Initial manifestation of methemoglobinemia is cyanosis, characterized by navy lips, tongue and mucous membranes, with skin color being slate grey. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia. Exposure may aggravate pre-existing eye, skin, or respiratory conditions.

### 2.4. Unknown Acute Toxicity (GHS-US)

No data available

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substance

Not applicable

### 3.2. Mixture

Name	Product Identifier	%	GHS-US classification
Ammonium perchlorate	(CAS No) 7790-98-9	50 - 85	Expl. 1.1, H201 Ox. Sol. 1, H271 Eye Irrit. 2A, H319 STOT RE 2, H373

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Decanedioic acid, bis(2-ethylhexyl) ester	(CAS No) 122-62-3	5 - 30	Not classified
Polyvinyl chloride	(CAS No) 9002-86-2	5 - 25	Comb. Dust
Oxamide	(CAS No) 471-46-5	0.5 - 10	Acute Tox. 4 (Oral), H302 Skin Irrit. 2, H315 Eye Irrit. 2A, H319
8-Oxa-3,5-dithia-4-stannatetradecanoic acid, 4,4-dibutyl-10-ethyl-7-oxo-, 2-ethylhexyl ester	(CAS No) 10584-98-2	0.1 - 0.5	Acute Tox. 4 (Oral), H302 Acute Tox. 3 (Dermal), H311 Acute Tox. 3 (Inhalation:dust,mist), H331 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Skin Sens. 1, H317 Muta. 2, H341 Repr. 1B, H360 STOT SE 1, H370 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Carbon black*	(CAS No) 1333-86-4	0.001 - 0.5	Comb. Dust Carc. 2, H351

\*It is suspected that carbon black dust causes cancer via inhalation. Because this component is polymer-bound, the risk of inhalation is minimal. Therefore, the Carc. 2 hazard does not apply to this product.

Full text of H-phrases: see section 16

### SECTION 4: FIRST AID MEASURES

#### 4.1. Description of First-aid Measures

**First-aid Measures General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

**First-aid Measures Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**First-aid Measures After Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Get medical advice/attention.

**First-aid Measures After Eye Contact:** Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

**First-aid Measures After Ingestion:** Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

#### 4.2. Most Important Symptoms and Effects Both Acute and Delayed

**Symptoms/Injuries:** Causes serious eye irritation. Causes skin irritation. Skin sensitization. There are potential chronic health effects to consider.

**Symptoms/Injuries After Inhalation:** Prolonged exposure may cause irritation.

**Symptoms/Injuries After Skin Contact:** Redness, pain, swelling, itching, burning, dryness, and dermatitis. May cause an allergic skin reaction.

**Symptoms/Injuries After Eye Contact:** Contact causes severe irritation with redness and swelling of the conjunctiva.

**Symptoms/Injuries After Ingestion:** Ingestion may cause methemoglobinemia. Initial manifestation of methemoglobinemia is cyanosis, characterized by navy lips, tongue and mucous membranes, with skin color being slate grey. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia.

**Chronic Symptoms:** May damage fertility or the unborn child. Repeated or prolonged exposure may cause damage to the thyroid gland.

#### 4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

### SECTION 5: FIRE-FIGHTING MEASURES

#### 5.1. Extinguishing Media

**Suitable Extinguishing Media:** Water spray, dry chemical, alcohol-resistant foam, carbon dioxide.

**Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.

#### 5.2. Special Hazards Arising From the Substance or Mixture

**Fire Hazard:** Explosive, could cause fire and secondary explosions. May cause fire or explosion; strong oxidizer.

**Explosion Hazard:** Explosives, Division 1.4 - Explosives (with no significant blast hazard). Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

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**Reactivity:** Fire or projection hazard. Oxidizer: increases the burning rate of combustible materials.

### 5.3. Advice for Firefighters

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** In case of fire: Evacuate area. Fight fire with normal precautions from a reasonable distance.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Hazardous Combustion Products:** Ammonia. Hydrogen chloride. Nitrogen oxides. Carbon oxides (CO, CO<sub>2</sub>). Sulfur dioxide.

**Other Information:** Do not allow run-off from fire fighting to enter drains or water courses.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal Precautions, Protective Equipment and Emergency Procedures

**General Measures:** Keep away from heat, sparks, open flames, hot surfaces. – No smoking. Do not get in eyes, on skin, or on clothing. Do not breathe dust, fumes. Evacuate danger area. Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking. Keep away from combustible material. Avoid all contact with skin, eyes, or clothing.

#### 6.1.1. For Non-Emergency Personnel

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel. Evacuate danger area.

#### 6.1.2. For Emergency Personnel

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Eliminate ignition sources. Ventilate area. Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

### 6.2. Environmental Precautions

Prevent entry to sewers and public waters. Avoid release to the environment.

### 6.3. Methods and Materials for Containment and Cleaning Up

**For Containment:** Contain solid spills with appropriate barriers and prevent migration and entry into sewers or streams. Absorb and contain with inert material. Place contents in suitable container for disposal. Use only non-sparking tools.

**Methods for Cleaning Up:** Clean up spills immediately and dispose of waste safely. Recover the product by vacuuming, shoveling or sweeping. Do not take up in combustible material such as: saw dust or cellulosic material. Transfer spilled material to a suitable container for disposal. Use only non-sparking tools. Be careful to avoid shock, friction, and contact with grit. Collect product for recovery or disposal. For release to land, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Collect contaminated soil and water, and absorbent for proper disposal. Notify applicable government authority if release is reportable or could adversely affect the environment. Contact competent authorities after a spill.

### 6.4. Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for Safe Handling

**Additional Hazards When Processed:** May cause or intensify fire; oxidizer.

**Other Information:** Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Keep away from sources of ignition - No smoking. Keep away from heat, sparks, open flames, hot surfaces, combustible materials, incompatible materials. - No smoking. Avoid contact with skin, eyes and clothing. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust, fumes.

**Handling Temperature:** < 200 °F (93.3 °C)

**Hygiene Measures:** This product is an explosive and should only be used under the supervision of trained and licensed personnel. Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

### 7.2. Conditions for Safe Storage, Including Any Incompatibilities

**Technical Measures:** Comply with applicable regulations. Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment.

**Storage Conditions:** Store under moderate temperatures recommended by competent authority. Store under dry conditions in a well ventilated magazine that has been approved for either detonator storage or explosive storage. Do NOT store explosives in a detonator magazine or detonators in an explosive magazine. Keep away from heat, spark and flames. Keep containers closed.

Explosives should be kept well away from initiating explosives; protected from physical damage; separated from oxidizing materials, combustibles, and sources of heat. Isolate from incompatibles. Keep/Store away from extremely high or low temperatures, direct sunlight, ignition sources, combustible materials, incompatible materials. Keep in fireproof place.

**Incompatible Products:** Strong acids, strong bases, strong oxidizers.

**Special Rules on Packaging:** Keep only in the original container.

# TP-J-3006 Propellant

## Safety Data Sheet

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### 7.3. Specific End Use(s)

Propellant

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), or OSHA (PEL).

Polyvinyl chloride (9002-86-2)		
USA ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (respirable fraction)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen
Carbon black (1333-86-4)		
USA ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	3 mg/m <sup>3</sup> (inhalable fraction)
USA ACGIH	ACGIH chemical category	Confirmed Animal Carcinogen with Unknown Relevance to Humans
USA NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	3.5 mg/m <sup>3</sup> 0.1 mg/m <sup>3</sup> (Carbon black in presence of Polycyclic aromatic hydrocarbons)
USA IDLH	US IDLH (mg/m <sup>3</sup> )	1750 mg/m <sup>3</sup>
USA OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	3.5 mg/m <sup>3</sup>

### 8.2. Exposure Controls

#### Appropriate Engineering Controls

: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Proper grounding procedures to avoid static electricity should be followed. Product to be handled in a closed system and under strictly controlled conditions. Use explosion-proof equipment. Gas detectors should be used when flammable gases or vapors may be released.

#### Personal Protective Equipment

: Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection.



#### Materials for Protective Clothing

: Chemically resistant materials and fabrics. Wear fire/flammable resistant/retardant clothing.

#### Hand Protection

: Wear protective gloves.

#### Eye Protection

: Chemical safety goggles.

#### Skin and Body Protection

: Wear suitable protective clothing.

#### Respiratory Protection

: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

#### Other Information

: When using, do not eat, drink or smoke.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on Basic Physical and Chemical Properties

Physical State	: Solid
Appearance	: Dark gray rubber
Odor	: Aromatic
Odor Threshold	: No data available
pH	: No data available
Evaporation Rate	: No data available
Melting Point	: No data available
Freezing Point	: No data available
Boiling Point	: No data available
Flash Point	: No data available
Auto-ignition Temperature	: No data available

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<b>Decomposition Temperature</b>	: No data available
<b>Flammability (solid, gas)</b>	: No data available
<b>Vapor Pressure</b>	: No data available
<b>Relative Vapor Density at 20°C</b>	: No data available
<b>Relative Density</b>	: No data available
<b>Solubility</b>	: No data available
<b>Partition Coefficient: N-Octanol/Water</b>	: No data available
<b>Viscosity</b>	: No data available
<b>Explosive Properties</b>	: Explosives, Division 1.4 - Explosives (with no significant blast hazard).
<b>Oxidizing Properties</b>	: May cause fire or explosion; strong oxidizer.

**9.2. Other Information** No additional information available.

## SECTION 10: STABILITY AND REACTIVITY

- 10.1. Reactivity:** Fire or projection hazard. Oxidizer: increases the burning rate of combustible materials.
- 10.2. Chemical Stability:** Extreme risk of explosion by shock, friction, fire or other sources of ignition. May cause fire or explosion; strong oxidizer.
- 10.3. Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4. Conditions to Avoid:** Keep away from open flames, hot surfaces and sources of ignition. Incompatible materials. Direct sunlight, extremely high or low temperatures, ignition sources, combustible materials, incompatible materials.
- 10.5. Incompatible Materials:** Strong acids, strong bases, strong oxidizers.
- 10.6. Hazardous Decomposition Products:** Thermal decomposition generates: Ammonia. Hydrogen chloride. Nitrogen oxides. Carbon oxides (CO, CO<sub>2</sub>). Sulfur dioxide.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information on Toxicological Effects

**Acute Toxicity:** Not classified

<b>8-Oxa-3,5-dithia-4-stannatetradecanoic acid, 4,4-dibutyl-10-ethyl-7-oxo-, 2-ethylhexyl ester (10584-98-2)</b>	
LD50 Oral Rat	510 mg/kg
LD50 Dermal Rat	777 mg/kg
LC50 Inhalation Rat	0.941 mg/l/4h
<b>Ammonium perchlorate (7790-98-9)</b>	
LD50 Oral Rat	4200 mg/kg
LD50 Dermal Rat	> 3500 mg/kg
<b>Oxamide (471-46-5)</b>	
ATE (Oral)	500.00 mg/kg body weight
<b>Carbon black (1333-86-4)</b>	
LD50 Oral Rat	> 8000 mg/kg

**Skin Corrosion/Irritation:** Causes skin irritation.

**Serious Eye Damage/Irritation:** Causes serious eye irritation.

**Respiratory or Skin Sensitization:** May cause an allergic skin reaction.

**Germ Cell Mutagenicity:** Not classified

**Carcinogenicity:** Not classified

<b>Polyvinyl chloride (9002-86-2)</b>	
IARC group	3
<b>Carbon black (1333-86-4)</b>	
IARC group	2B
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.

**Reproductive Toxicity:** May damage fertility or the unborn child.

**Specific Target Organ Toxicity (Single Exposure):** Not classified

**Specific Target Organ Toxicity (Repeated Exposure):** May cause damage to organs through prolonged or repeated exposure.

**Aspiration Hazard:** Not classified

**Symptoms/Injuries After Inhalation:** Prolonged exposure may cause irritation.

**Symptoms/Injuries After Skin Contact:** Redness, pain, swelling, itching, burning, dryness, and dermatitis. May cause an allergic skin reaction.

**Symptoms/Injuries After Eye Contact:** Contact causes severe irritation with redness and swelling of the conjunctiva.

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**Symptoms/Injuries After Ingestion:** Ingestion may cause methemoglobinemia. Initial manifestation of methemoglobinemia is cyanosis, characterized by navy lips, tongue and mucous membranes, with skin color being slate grey. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia.

**Chronic Symptoms:** May damage fertility or the unborn child. Repeated or prolonged exposure may cause damage to the thyroid gland.

### SECTION 12: ECOLOGICAL INFORMATION

#### 12.1. Toxicity

**Ecology - General** : Toxic to aquatic life. Harmful to aquatic life with long lasting effects.

<b>8-Oxa-3,5-dithia-4-stannatetradecanoic acid, 4,4-dibutyl-10-ethyl-7-oxo-, 2-ethylhexyl ester (10584-98-2)</b>	
<b>LC50 Fish 1</b>	11.7 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [static])
<b>EC50 Daphnia 1</b>	0.035 mg/l (Exposure time: 48 h - Species: Daphnia magna Straus)
<b>Carbon black (1333-86-4)</b>	
<b>EC50 Daphnia 1</b>	5600 mg/l (Exposure time: 24 h - Species: Daphnia magna)

#### 12.2. Persistence and Degradability

<b>TP-J-3006 Propellant</b>	
<b>Persistence and Degradability</b>	May cause long-term adverse effects in the environment.

#### 12.3. Bioaccumulative Potential

<b>TP-J-3006 Propellant</b>	
<b>Bioaccumulative Potential</b>	Not established.
<b>8-Oxa-3,5-dithia-4-stannatetradecanoic acid, 4,4-dibutyl-10-ethyl-7-oxo-, 2-ethylhexyl ester (10584-98-2)</b>	
<b>Log Pow</b>	1.49

**12.4. Mobility in Soil** No additional information available.

#### 12.5. Other Adverse Effects

**Other Information** : Avoid release to the environment.

### SECTION 13: DISPOSAL CONSIDERATIONS

#### 13.1. Waste Treatment Methods

**Waste Disposal Recommendations:** Dispose of contents/container in accordance with local, regional, national, and international regulations.

**Ecology - Waste Materials:** Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.



# TP-J-3006 Propellant

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### SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT, this SDS covers the following EX number

EX2004020073	Alliant Techsystems Operations LLC	Fifth	1.4S	UN0481	TP-J-3006	Substances, Explosive, n.o.s. (solid propellant)	Diameter, in.	Length, in.	Wt. per stick, g.	Notes
							3/4 max.	16 max.	191.0 max.	The following packaging method is assigned by the Competent Authority of the United States: Inner Packaging – Bags, heat sealed anti-static or velostat, each containing one (1) extruded cylindrical grain. Outer Packaging – UN 4G fiberboard box, each containing no more than seven (7) inner packagings and not more than 764g NEW per outer packaging. This classification meets UN 6(d) criteria. This approval as revised supersedes all previous versions.

# TP-J-3006 Propellant

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## SECTION 15: REGULATORY INFORMATION

### 15.1. US Federal Regulations

<b>TP-J-3006 Propellant</b>	
<b>SARA Section 311/312 Hazard Classes</b>	Sudden release of pressure hazard Fire hazard Immediate (acute) health hazard Delayed (chronic) health hazard
<b>Polyvinyl chloride (9002-86-2)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>Decanedioic acid, bis(2-ethylhexyl) ester (122-62-3)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>8-Oxa-3,5-dithia-4-stannatetradecanoic acid, 4,4-dibutyl-10-ethyl-7-oxo-, 2-ethylhexyl ester (10584-98-2)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>Ammonium perchlorate (7790-98-9)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>Oxamide (471-46-5)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>Carbon black (1333-86-4)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

### 15.2. US State Regulations

<b>Carbon black (1333-86-4)</b>	
<b>U.S. - California - Proposition 65 - Carcinogens List</b>	WARNING: This product contains chemicals known to the State of California to cause cancer.
<b>Polyvinyl chloride (9002-86-2)</b>	
U.S. - New Jersey - Right to Know Hazardous Substance List	
<b>Ammonium perchlorate (7790-98-9)</b>	
U.S. - Massachusetts - Right To Know List	
U.S. - New Jersey - Right to Know Hazardous Substance List	
U.S. - Pennsylvania - RTK (Right to Know) List	
<b>Carbon black (1333-86-4)</b>	
U.S. - Massachusetts - Right To Know List	
U.S. - New Jersey - Right to Know Hazardous Substance List	
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances	
U.S. - Pennsylvania - RTK (Right to Know) List	

## SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

### Other Information

: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200

### GHS Full Text Phrases:

Acute Tox. 3 (Dermal)	Acute toxicity (dermal) Category 3
Acute Tox. 3 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 3
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Acute 2	Hazardous to the aquatic environment - Acute Hazard Category 2
Aquatic Chronic 1	Hazardous to the aquatic environment - Chronic Hazard Category 1
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Carc. 2	Carcinogenicity Category 2
Comb. Dust	May form combustible dust concentrations in air
Expl. 1.1	Explosive Category 1.1
Expl. 1.4	Explosive Category 1.4

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Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Muta. 2	Germ cell mutagenicity Category 2
Ox. Sol. 1	Oxidizing solids Category 1
Repr. 1B	Reproductive toxicity Category 1B
Skin Irrit. 2	Skin corrosion/irritation Category 2
Skin Sens. 1	Skin sensitization Category 1
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
STOT SE 1	Specific target organ toxicity (single exposure) Category 1
H201	Explosive; mass explosion hazard
H204	Fire or projection hazard
H271	May cause fire or explosion; strong oxidizer
H302	Harmful if swallowed
H311	Toxic in contact with skin
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H331	Toxic if inhaled
H341	Suspected of causing genetic defects
H351	Suspected of causing cancer
H360	May damage fertility or the unborn child
H370	Causes damage to organs
H373	May cause damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H401	Toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

SDS US (GHS HazCom)



U.S. Department  
of Transportation

East Building, PHH – 32  
1200 New Jersey Avenue, Southeast  
Washington, D.C. 20590

**Pipeline and Hazardous  
Materials Safety Administration**

**The US Department of Transportation  
Competent Authority for the United States**

**CLASSIFICATION OF EXPLOSIVES**  
**FIFTH REVISION**

Based upon a request by Alliant Techsystems Operations LLC, 55 Thiokol Road, Elkton, MD 21921, US, the following items are classed in accordance with Section 173.56, Title 49, Code of Federal Regulations (49 CFR). A copy of your application, all supporting documentation and a copy of this approval must be retained and made available to DOT upon request.

An EX approval is non-transferable in any merger, acquisition, sale of assets, or other business transaction. For more information, please visit:  
[<https://www.phmsa.dot.gov/registration/faq-mergers-acquisitions-and-legal-status-changes-pdf>]

**U.N. PROPER SHIPPING NAME AND NUMBER:**

Substances, explosive, n.o.s., UN0481

**U.N. CLASSIFICATION CODE:** 1.4S

**REFERENCE NUMBER:**

EX2004020073

**PRODUCT DESIGNATION/PART NUMBER:**

TP-J-3006 \* Propelling Stick  
(Maximum represented by D: 3/4 ", L: 16", Wt per  
Stick: 191.0 grams)

**NOTES:** The following packaging method is assigned by the Competent Authority of the United States: Inner Packaging - Bags, heat sealed anti-static or velostat, each containing one (1) extruded cylindrical grain. Outer Packaging - UN 4G fiberboard box, each containing no more than seven (7) inner packagings and not more than 764g NEW per outer packaging. This classification meets UN 6(d) criteria.  
This approval as revised supersedes all previous versions.

**DATED:** January 15, 2020

for William Schoonover  
Associate Administrator for Hazardous Materials Safety

# SAFETY DATA SHEET

## Bromine Trifluoride

### Section 1. Identification

<b>GHS product identifier</b>	: Bromine Trifluoride
<b>Chemical name</b>	: bromine trifluoride
<b>Other means of identification</b>	: BrF <sub>3</sub> ; Bromine fluoride; Bromine fluoride (BrF <sub>3</sub> ); UN 1746
<b>Product type</b>	: Liquid.
<b>Product use</b>	: Synthetic/Analytical chemistry.
<b>Synonym</b>	: BrF <sub>3</sub> ; Bromine fluoride; Bromine fluoride (BrF <sub>3</sub> ); UN 1746
<b>SDS #</b>	: 001112
<b>Supplier's details</b>	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
<b>24-hour telephone</b>	: 1-866-734-3438

### Section 2. Hazards identification

<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Classification of the substance or mixture</b>	: OXIDIZING LIQUIDS - Category 1 ACUTE TOXICITY (inhalation) - Category 2 SKIN CORROSION - Category 1 SERIOUS EYE DAMAGE - Category 1 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2

#### GHS label elements

##### Hazard pictograms



**Signal word** : Danger

**Hazard statements** : May cause fire or explosion; strong oxidizer.  
Causes severe skin burns and eye damage.  
Fatal if inhaled.  
May cause damage to organs through prolonged or repeated exposure.

#### Precautionary statements

##### General

: Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Open valve slowly. Use only with equipment cleaned for Oxygen service.

##### Prevention

: Wear fire resistant or flame retardant clothing. Wear protective gloves. Wear protective clothing. Wear eye or face protection. In case of inadequate ventilation wear respiratory protection. Keep away from heat. No smoking. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Use only outdoors or in a well-ventilated area. Do not breathe vapor.

##### Response

: Get medical advice or attention if you feel unwell. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing

## Section 2. Hazards identification

	clothes.
<b>Storage</b>	: Store locked up.
<b>Disposal</b>	: Dispose of contents and container in accordance with all local, regional, national and international regulations.
<b>Supplemental label elements</b>	: Protect from moisture. Keep container tightly closed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only with adequate ventilation.
<b>Hazards not otherwise classified</b>	: Water reactive. Reacts with water to release toxic gas. May be fatal if inhaled.  None known.

## Section 3. Composition/information on ingredients

<b>Substance/mixture</b>	: Substance
<b>Chemical name</b>	: bromine trifluoride
<b>Other means of identification</b>	: BrF <sub>3</sub> ; Bromine fluoride; Bromine fluoride (BrF <sub>3</sub> ); UN 1746
<b>Product code</b>	: 001112

### CAS number/other identifiers

**CAS number** : 7787-71-5

Ingredient name	%	CAS number
Bromine Trifluoride	100	7787-71-5

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**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

<b>Eye contact</b>	: 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.
<b>Inhalation</b>	: 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.
<b>Skin contact</b>	: 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.
<b>Ingestion</b>	: 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.

## Section 4. First aid measures

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** : Fatal if inhaled.
- Skin contact** : Causes severe burns.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Ingestion** : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:., pain, watering, redness
- Inhalation** : No specific data.
- 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. Gloves should be worn when removing clothing to prevent additional exposure.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

- Suitable extinguishing media** : Use dry chemical or CO<sub>2</sub>.
- 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 equipment for 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 suitable training. 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 specialized 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 7. Handling and storage

### Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not ingest. Empty containers retain product residue and can be hazardous. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Do not reuse container. Protect from moisture. Keep away from clothing, incompatible materials and combustible materials. Do not breathe vapor or mist. Keep away from heat. Wear fire resistant clothing.

- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep away from water or moist air. Store locked up. Separate from reducing agents and combustible materials. Store away from grease and oil. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.



## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
Bromine Trifluoride	None.

**Appropriate engineering controls** : Use only with adequate ventilation. Engineering controls may be required to control the primary or secondary risks associated with this product. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

**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

**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** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

## Section 9. Physical and chemical properties

### Appearance

**Physical state** : Liquid.  
**Color** : Yellow or Gray  
**Odor** : Obnoxious.  
**Odor threshold** : Not available.  
**pH** : Not available.  
**Melting point** : 8.77°C (47.8°F)  
**Boiling point** : 127°C (260.6°F)  
**Critical temperature** : >20°C (>68°F)

## Section 9. Physical and chemical properties

<b>Flash point</b>	: Not available.
<b>Evaporation rate</b>	: Not available.
<b>Flammability (solid, gas)</b>	: Not available.
<b>Lower and upper explosive (flammable) limits</b>	: Not available.
<b>Vapor pressure</b>	: Not available.
<b>Vapor density</b>	: Not available.
<b>Specific Volume (ft<sup>3</sup>/lb)</b>	: Not applicable
<b>Gas Density (lb/ft<sup>3</sup>)</b>	: Not available.
<b>Relative density</b>	: 4.7
<b>Solubility</b>	: Not available.
<b>Solubility in water</b>	: Not available.
<b>Partition coefficient: n-octanol/water</b>	: Not available.
<b>Auto-ignition temperature</b>	: Not available.
<b>Decomposition temperature</b>	: Not available.
<b>Viscosity</b>	: Not available.
<b>Flow time (ISO 2431)</b>	: Not available.
<b>Molecular weight</b>	: 136.9 g/mole

## Section 10. Stability and reactivity

<b>Reactivity</b>	: No specific test data related to reactivity available for this product or its ingredients.
<b>Chemical stability</b>	: The product is stable.
<b>Possibility of hazardous reactions</b>	: 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
<b>Conditions to avoid</b>	: Drying on clothing or other combustible materials may cause fire.
<b>Incompatible materials</b>	: Highly reactive or incompatible with the following materials: combustible materials reducing materials water
<b>Hazardous decomposition products</b>	: Contact with water liberates toxic gas.
<b>Hazardous polymerization</b>	: Under normal conditions of storage and use, hazardous polymerization will not occur.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Bromine Trifluoride	LC50 Inhalation Gas.	Rat	7.5 ppm	4 hours

#### 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)

Not available.

#### Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Bromine Trifluoride	Category 2	-	-

#### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

#### Potential acute health effects

- Eye contact** : Causes serious eye damage.
- Inhalation** : Fatal if inhaled.
- Skin contact** : Causes severe burns.
- Ingestion** : No known significant effects or critical hazards.

#### Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : Adverse symptoms may include the following: pain, watering, redness
- Inhalation** : No specific data.
- 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

## Section 11. Toxicological information

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

Not available.

**General** : May cause damage to organs through prolonged or repeated exposure.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**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

Route	ATE value
Inhalation (gases)	100 ppm

## Section 12. Ecological information

### Toxicity

Not available.

### Persistence and degradability

Not available.

### Bioaccumulative potential

Not available.

### Mobility in soil

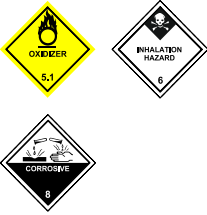
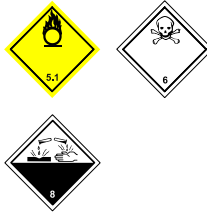

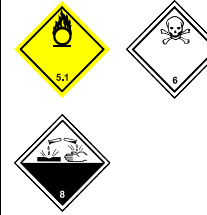
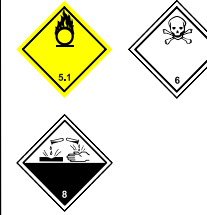
**Soil/water partition coefficient ( $K_{oc}$ )** : Not available.

**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
<b>UN number</b>	UN1746	UN1746	UN1746	UN1746	UN1746
<b>UN proper shipping name</b>	BROMINE TRIFLUORIDE	BROMINE TRIFLUORIDE	BROMINE TRIFLUORIDE	BROMINE TRIFLUORIDE	BROMINE TRIFLUORIDE
<b>Transport hazard class(es)</b>	5.1 (6.1, 8) 	5.1 (6.1, 8) 	8 (5.1, 6.1) 	5.1 (6.1, 8) 	5.1 (6.1, 8) 
<b>Packing group</b>	I	I	I	I	I
<b>Environmental hazards</b>	No.	No.	No.	No.	No.

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

### Additional information

#### DOT Classification

: Toxic - Inhalation hazard Zone B

**Limited quantity** Yes.

**Quantity limitation** Passenger aircraft/rail: Forbidden. Cargo aircraft: Forbidden.

**Special provisions** 2, B9, B14, B32, B74

#### TDG Classification

: Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.23-2.25 (Class 5), 2.26-2.36 (Class 6), 2.40-2.42 (Class 8).

**Explosive Limit and Limited Quantity Index** 0

**ERAP Index** 1000

**Passenger Carrying Vessel Index** Forbidden

**Passenger Carrying Road or Rail Index** Forbidden

#### IATA

: **Quantity limitation** Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: Forbidden.

**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 IMO instruments** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : TSCA 8(a) CDR Exempt/Partial exemption: Not determined

**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

## Section 15. Regulatory information

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

### 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.

### California Prop. 65

This product does not require a Safe Harbor warning under California Prop. 65.

### International regulations

#### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

#### Montreal Protocol

Not listed.

#### Stockholm Convention on Persistent Organic Pollutants

Not listed.

#### Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

#### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

### Inventory list

**Australia** : This material is listed or exempted.

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

**China** : Not determined.

**Europe** : This material is listed or exempted.

**Japan** : **Japan inventory (ENCS)**: Not determined.  
**Japan inventory (ISHL)**: Not determined.

**New Zealand** : Not determined.

**Philippines** : This material is listed or exempted.

**Republic of Korea** : This material is listed or exempted.

**Taiwan** : Not determined.

**Thailand** : Not determined.

**Turkey** : Not determined.

**United States** : This material is active or exempted.

**Viet Nam** : Not determined.

## Section 16. Other information

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

Health	/	4
Flammability		0
Physical hazards		0

**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 and the associated label are not required on SDSs or products leaving a facility 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 trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

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



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

### Procedure used to derive the classification

Classification	Justification
OXIDIZING LIQUIDS - Category 1	Expert judgment
ACUTE TOXICITY (inhalation) - Category 2	Expert judgment
SKIN CORROSION - Category 1	Expert judgment
SERIOUS EYE DAMAGE - Category 1	Expert judgment
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2	Expert judgment

### History

**Date of printing** : 1/5/2022  
**Date of issue/Date of revision** : 1/5/2022  
**Date of previous issue** : 9/27/2018  
**Version** : 0.05

### 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 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
 UN = United Nations

### References

: Not available.

### Notice to reader

## Section 16. Other information

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.





U.S. Department  
of Transportation

**Pipeline and Hazardous  
Materials Safety  
Administration**

**December 06, 2021**

1200 New Jersey Avenue, SE  
Washington, DC 20590

DOT-SP 14796  
(EIGHTH REVISION)

**EXPIRATION DATE: 2022-10-31**

(FOR RENEWAL SEE 49 CFR 107.109)

1. GRANTEE: Chammas Cutters Inc.  
Houston, TX
2. PURPOSE AND LIMITATION:
  - a. This special permit authorizes the transportation in commerce of non-DOT specification cylinders containing bromine trifluoride. The cylinders will be integrated into a tool to form a chemical cutter. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein. The most recent revision supersedes all previous revisions.
  - b. The safety analyses performed in the development of this special permit only considered the hazards and risks associated with the transportation in commerce.
  - c. No party status will be granted to this special permit.
3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.
4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR § 172.101 Column (9B) in that bromine trifluoride is forbidden by cargo-only aircraft, § 172.301(c) in that marking the special permit number on each cylinder is required, and §§ 173.228(a).
5. BASIS: This special permit is based on the Pipeline and Hazardous Materials Safety Administration's (PHMSA) Show Cause Letter issued in accordance with § 107.121(a) initiated on March 1, 2021, and additional information submitted by Chammas Cutters Inc on November 22, 2021.

Tracking Number: 2021115536

6. HAZARDOUS MATERIALS (49 CFR 172.101):

<b>Hazardous Materials Description</b>			
<b>Proper Shipping Name</b>	<b>Hazard Class/ Division</b>	<b>Identification Number</b>	<b>Packing Group</b>
Bromine trifluoride	5.1*	UN1746	I, Hazard Zone B

\* In addition to the oxidizer label, Division 6.1 and Class 8 labels are required.

7. SAFETY CONTROL MEASURES:a. PACKAGING:

(1) Packagings prescribed are non-DOT specification, non-refillable, seamless cylinders manufactured from cold drawn SAE 4130, 4135, or 4140 alloy steel tubing, with threaded plug closures (transport plugs) at each end. The transport plugs render the rupture discs on each cylinder inoperable during transportation. Each cylinder must conform with Chammas Cutters, Incorporated (CCI) drawings on file with the Office of Hazardous Materials Safety (OHMS). The cylinders range from: 4.8 to 118.4 cubic inches chemical volume; 11/16 inch to 3 1/8 inches outside diameter; and, 24 to 84 inches in length.

(2) The maximum charge pressure of the cylinder must be 700 psig at 130 °F. The ratio of design burst pressure to charge pressure at 130 °F must be at least 40:1.

(3) The maximum filling density must be such that the liquid content must not completely fill the cylinder at 54 °C (130 °F).

b. TESTING: At the time of manufacture, each cylinder must be pressure tested to a minimum of 5,000 psig without evidence of failure.

c. OPERATIONAL CONTROLS:

(1) Emergency response information provided with the shipment and available via an emergency response telephone number must indicate that the pressure relief devices fitted on the cylinder have been rendered non-functional and provide appropriate guidance for exposure to fire.

(2) Cylinders must be overpacked in a strong wooden crate with a maximum capacity of six cylinders per box. The wooden box must be as shown on the CCI drawing entitled “Chemical Cylinder Shipping Box” dated November 2, 2008 on file with OHMS.

(3) Advance Notice of FAA Regional Dangerous Goods Manager. The operator of the aircraft must notify the regional Dangerous Goods Manager in the region where the flight will originate of their intent to transport this material. This notification must be given at least 72 hours in advance of plans to operate under the special permit, unless prior arrangements have been made with the cognizant Regional Dangerous Goods Manager. The notification must include the point of departure, intermediate stops, destination(s), and a loading and departure schedule. Alternate notification procedures may be established subject to the written approval of the cognizant Regional Dangerous Goods Manager.

8. SPECIAL PROVISIONS:

a. A person who is not a holder of this special permit who receives a package covered by this special permit may reoffer it for transportation provided no modification or change is made to the package and it is reoffered for transportation in conformance with this special permit and the HMR.

b. Each air carrier who is offered bromine trifluoride for transportation under the terms of this special permit requires their own special permit or party status to an existing air carrier’s special permit authorizing such transportation.

c. A current copy of this special permit must be maintained at each facility where the package is offered or reoffered for transportation.

d. MARKING: The marking requirements of § 172.301(c) are waived. Each wooden crate must be marked “INSIDE CONTAINERS COMPLY WITH DOT-SP 14796”.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, and cargo aircraft only.

10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each cargo vessel, aircraft, or motor vehicle used to transport packages covered by this special permit. The shipper must furnish a current copy of this special permit to the air carrier before or at the time the shipment is tendered.

11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this special permit and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:

- o All terms and conditions prescribed in this special permit and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
- o Persons operating under the terms of this special permit must comply with the security plan requirement in Subpart I of Part 172 of the HMR, when applicable.
- o Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this special permit must receive training on the requirements and conditions of this special permit in addition to the training required by §§ 172.700 through 172.704.

No person may use or apply this special permit, including display of its number, when this special permit has expired or is otherwise no longer in effect.

Under Title VII of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)—“The Hazardous Materials Safety and Security Reauthorization Act of 2005” (Pub. L. 109-59), 119 Stat. 1144 (August 10, 2005), amended the Federal hazardous materials transportation law by changing the term “exemption” to “special permit” and authorizes a special permit to be granted up to two years for new special permits and up to four years for renewals.

12. REPORTING REQUIREMENTS: Shipments or operations conducted under this special permit are subject to the Hazardous Materials Incident Reporting requirements specified in 49 CFR §§ 171.15 Immediate notice of certain hazardous materials incidents, and 171.16 Detailed hazardous materials incident reports. In addition, the grantee(s) of this special permit must notify the Associate Administrator for Hazardous Materials Safety, in writing, of any incident involving a package, shipment or operation conducted under terms of this special permit.

Issued in Washington, D.C.:



for William Schoonover  
Associate Administrator for Hazardous Materials Safety

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Material Safety Administration, U.S. Department of Transportation, East Building PHH-13, 1200 New Jersey Avenue, Southeast, Washington, D.C. 20590.

Copies of this special permit may be obtained by accessing the Hazardous Materials Safety Homepage at <https://www.phmsa.dot.gov/approvals-and-permits/hazmat/special-permits-search>. Photo reproductions and legible reductions of this special permit are permitted. Any alteration of this special permit is prohibited.

PO: CWF/TG