UTC Aerospace Systems
Fire Protection Systems

SAFETY DATA SHEET
Bromotrifluoromethane (CBrF3) and Methanol (Pressurized with Nitrogen)

1. IDENTIFICATION

Product Name	Bromotrifluoromethane (CBrF3) and Methanol (Pressurized with Nitrogen)
Other Names	Halon 1301
Recommended use of the chemical and restrictions on use	
Identified uses	Fire Extinguishing Agent
Restrictions on Use	Consult applicable fire protection codes
Company Identification	UTC Aerospace Systems 4200 Airport Drive, NW Wilson, NC 27896
Customer Information Number	(252) 237-7004
Emergency Telephone Number	
3E Company	1-800-451-8346 Site Code: 33067
Issue Date	May 16, 2017
Supersedes Date	Feb 16, 2016 Rev B

Safety Data Sheet prepared in accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200) and the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

2. HAZARD IDENTIFICATION

Hazard Classification
Gas under pressure – Liquefied gas
Specific Target Organ Toxicity Single Exposure – Category 3
Toxic to Reproduction – Category 1B
Simple Asphyxiant
Hazardous to the Ozone Layer – Category 1 (This classification not adopted by OSHA.)

Label Elements
Hazard Symbols

Signal Word: Danger

Hazard Statements
Contents under pressure; may explode if heated.
May cause drowsiness or dizziness.
May damage fertility or the unborn child.
May displace oxygen and cause rapid suffocation.
Harms public health and the environment by destroying ozone in the upper atmosphere.

2. HAZARD IDENTIFICATION

Precautionary Statements

Prevention

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wear protective gloves, protective clothing, eye protection and face protection.
Do not enter confined space unless adequately ventilated.
In case of inadequate ventilation wear respiratory protection.
Avoid breathing gas, vapors or spray.
Use only outdoors or in a well ventilated area.

Response

If inhaled: Remove person to fresh air and keep comfortable for breathing.
Call a poison control center or doctor if you feel unwell.
If exposed or concerned: Call a poison center or doctor/physician.

Storage

Protect from sunlight.
Store in well-ventilated place.
Keep container tightly closed.
Keep locked up.

Disposal

Dispose of contents/container in accordance with local regulation.
Refer to manufacturer or supplier for information on recovery and recycling.

Other Hazards

Direct contact with the cold gas or liquid can cause freezing of exposed tissues.

Specific Concentration Limits

The values listed below represent the percentages of ingredients of unknown toxicity.

Acute oral toxicity	0%
Acute dermal toxicity	0%
Acute inhalation toxicity	0%
Acute aquatic toxicity	98%

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Halon 1301
This product is a mixture.

Component	CAS Number	Concentration
Bromotrifluoromethane	75-63-8	98%
Methanol	67-56-1	2%

Note: This product uses nitrogen as the expellant and also contains a small amount of helium.

4. FIRST- AID MEASURES

Description of necessary first-aid measures

Eyes

Immediately flood the eye with plenty of warm water for at least 15 minutes, holding the eye open. Obtain medical attention if soreness or redness persists.

Skin

Flush with water. Obtain medical attention if frostbite or blistering occurs or redness persists.

Ingestion

Ingestion is not considered a potential route of exposure.

Inhalation

Remove from exposure. If there is difficulty in breathing, give oxygen. Obtain medical attention immediately.

Most important symptoms/effects, acute and delayed

Aside from the information found under Description of necessary first aid measures (above) and Indication of immediate medical attention and special treatment needed, no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

Notes to Physicians

Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should only be used with special caution in situations of emergency life support.

5. FIRE - FIGHTING MEASURES

Suitable Extinguishing Media

This preparation is used as an extinguishing agent and therefore is not a problem when trying to control a fire. Use extinguishing agent appropriate to other materials involved. Keep pressurized containers and surroundings cool with water spray as they may rupture or burst in the heat of a fire.

Specific hazards arising from the chemical

Pressurized containers may explode in heat of fire. Predominant decomposition products are hydrogen fluoride and hydrogen bromide in fire situations. Products are irritant and potentially toxic if fire extinguishment is delayed.

Special Protective Actions for Fire-Fighters

Wear full protective clothing and self-contained breathing apparatus as appropriate for specific fire conditions.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Remove leaking cylinder to a safe place. Ventilate the area. Leaks inside confined spaces may cause suffocation as oxygen is displaced and should not be entered without a self-contained breathing apparatus.

Environmental Precautions

None

6. ACCIDENTAL RELEASE MEASURES

Methods and materials for containment and cleaning up
None

7. HANDLING AND STORAGE

Precautions for safe handling
Wear appropriate protective clothing. Prevent skin and eye contact.

Conditions for safe storage
Pressurized containers should be properly stored and secured to prevent falling or being knocked over. Do not drag, slide or roll pressurized containers. Do not drop pressurized containers or permit them to strike against each other. Never apply flame or localized heat directly to any part of the pressurized or plastic container. Store pressurized and plastic containers away from high heat sources. Storage area should be: cool - dry - well ventilated - under cover - out of direct sunlight.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure limits are listed below, if they exist.

Methane, bromotrifluoro-
ACGIH TLV: 1000 ppm TWA
OSHA PEL: 1000 ppm (6100mg/$m^{3)}$ TWA
Methanol
ACGIH: 200ppm 8h TWA; 250ppm 15-minute STEL.
OSHA: 200ppm (260 mg/m3) 8h TWA.

Appropriate engineering controls
Use with adequate ventilation. There should be local procedures for the selection, training, inspection and maintenance of this equipment. When used in large volumes, use local exhaust ventilation.

Individual protection measures
Respiratory Protection
Not normally required. In oxygen deficient atmospheres, use a self-contained breathing apparatus, as an air purifying respirator will not provide protection.
Skin Protection
Gloves
Eye/Face Protection
Chemical goggles or safety glasses with side shields.
Body Protection
Normal work wear.

9. PHYSICAL AND CHEMICAL PROPERTIES

Agent	
Appearance	
Physical State	Liquefied gas under pressure
Color	Colorless
Odor	Slight ether

9. PHYSICAL AND CHEMICAL PROPERTIES

Odor Threshold	No data available
pH	Not applicable
Specific Gravity	No data available
Boiling Range/Point (°C/F)	-58°C/ - 72 °F (Bromotrifluoromethane)
Melting Point (°C/F)	No data available
Flash Point (PMCC) (°C/F)	Not flammable
Vapor Pressure	235 psia @ 77°F(Bromotrifluoromethane)
Evaporation Rate (BuAc=1)	No data available
Solubility in Water	0.03 wt% @ 77 °F(Bromotrifluoromethane)
Vapor Density (Air = 1)	5.14(Bromotrifluoromethane)
VOC (g/l)	No data available
VOC (%)	No data available
Partition coefficient (n-octanol/water)	No data available
Viscosity	Not applicable
Auto-ignition Temperature	No data available
Decomposition Temperature	No data available
Upper explosive limit	Not explosive
Lower explosive limit	Not explosive
Flammability (solid, gas)	Not flammable

Nitrogen and Helium

Appearance	
Physical State	Compressed gas
Color	Colorless
Odor	None
Odor Threshold	No data available
pH	Not applicable
Specific Gravity	1.251 g/l (Nitrogen) 0.1786 g/l (Helium)
Boiling Range/Point (°C/F)	-196 °C/-321 °F(Nitrogen) -268.9 °C /-109.3 °F(Helium)
Melting Point (°C/F)	-210 °C/-346 °F(Nitrogen) -272.2 °C /-452.0 °F(Helium)
Flash Point (PMCC) (°C/F)	Not flammable
Vapor Pressure	No data available
Evaporation Rate (BuAc=1)	No data available
Solubility in Water	No data available
Vapor Density (Air = 1)	Not applicable
VOC (g/l)	None
VOC (%)	None
Partition coefficient (n-octanol/water)	No data available
Viscosity	Not applicable
Auto-ignition Temperature	No data available
Decomposition Temperature	No data available
Upper explosive limit	Not explosive
Lower explosive limit	Not explosive
Flammability (solid, gas)	Not flammable

10. STABILITY AND REACTIVITY

Reactivity
Pressurized containers may rupture or explode if exposed to heat.

Chemical Stability
Stable under normal conditions.

Possibility of hazardous reactions
Hazardous polymerization will not occur.

Conditions to Avoid
Extremely high temperatures

Incompatible Materials
Alkali or alkaline earth metals - powdered metals (ex. aluminum, zinc, etc.)

Hazardous Decomposition Products
Hydrogen fluoride – hydrogen bromide – free bromine – carbonyl halides

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
Bromotrifluoromethane
Inhalation LC50 (Rat) >800,000 ppm 4hr
Inhalation 1-hour LC50(rat) >770,000 ppm
Methanol
LD 50 Oral >50 and < 300 mg/kg (based on ECHA classification of Category 3)
LD 50 Dermal >200 and < 1000 mg/kg (based on ECHA classification of Category 3)
LC50 Inhalation >2.0 and < 10.0 mg/l (based on ECHA classification of Category 3)
Nitrogen
Simple asphyxiant
Helium
Simple asphyxiant

Specific Target Organ Toxicity (STOT) – single exposure
Bromotrifluoromethane: Cardiac sensitization (canine) NOAEL (5 min-ppm) 50,000, LOAEL (5 min-ppm) 75,000, EC50 200,000 ppm
Human exposure studies: Brief (3 min) exposures at 40,000 ppm causes dizziness and drowsiness**.** Brief (3 min) exposures at ≤30,000 ppm or 1000 ppm at 30 minutes produced no responses.

Specific Target Organ Toxicity (STOT) – repeat exposure
Bromotrifluoromethane: Short term repeated exposure toxicity studies in rat (2hr/day for 15 days): NOAEL 500,000 ppm. A 90 day repeat exposure study (rat): NOAEL 23,000 ppm, target organ of concern – respiratory tract.

Serious Eye damage/Irritation
Methanol: Not classified as irritating to eyes based on rabbit study.

Skin Corrosion/Irritation
Methanol: Not irritating in animal studies.

11. TOXICOLOGICAL INFORMATION

Respiratory or Skin Sensitization
Methanol: Not sensitizing in guinea pig studies (skin).

Carcinogenicity
Not considered carcinogenic by NTP, IARC, and OSHA.

Germ Cell Mutagenicity
Bromotrifluormethane: Negative in Ames test (In Vitro Bacteria) for mutagenicity.

Reproductive Toxicity
Bromotrifluormethane: Developmental toxicity study (rat) NOAEL: 49,505 ppm
Methanol: Methanol has caused birth defects in mice at doses nontoxic to the mother as well as slight behavioral effects in offspring of rats.

Aspiration Hazard
Not an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicity
No data available.

Mobility in soil
No relevant studies identified.

Persistence/Degradability
No relevant studies identified.

Bioaccumulative Potential
No relevant studies identified.

Other adverse effects
Causes harm to the ozone layer. The ozone depleting potential for bromotrifluoromethane is 10.

13. DISPOSAL CONSIDERATIONS

Disposal Methods
Dispose of container in accordance with all applicable local and national regulations. Refer to manufacturer or supplier for information on recovery and recycling. Do not cut, puncture or weld on or near to the pressurized container.

14. TRANSPORT INFORMATION

DOT CFR 172.101 Data	Compressed Gas, N.O.S., (Bromotrifluoromethane, Nitrogen), (2.2) UN1956
UN Proper Shipping Name	Compressed Gas, N.O.S., (Bromotrifluoromethane, Nitrogen)
UN Class	(2.2)
UN Number	UN1956

14. TRANSPORT INFORMATION

UN Packaging Group	None
Classification for AIR Transportation (IATA)	Consult current IATA Regulations prior to shipping by air.

Containers must be shipped with the appropriate safety caps.

Note: Kidde Aerospace has party status to DOT Special Permit 12726 (DOT-SP-12726) to ship cylinders containing Bromotrifluoromethane as UN1044. Unless another shipper has party status to DOT-E-12726, the cylinders covered by this SDS must be shipped as UN1956.

15. REGULATORY INFORMATION

United States TSCA Inventory
All components of this product are in compliance with the inventory listing requirements of the US Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

Canada DSL Inventory
All ingredients in this product have been verified for inclusion on the Domestic Substance List (DSL).

SARA Title III Sect. 311/312 Categorization
Immediate (Acute) Health Hazard - Delayed (Chronic) Heatlh Hazard - Pressure Hazard

SARA Title III Sect. 313
This product contains the following chemicals which are listed in Section 313 at or above de minimis concentrations: Methane, bromotrifluoro- (75-63-8) – Methanol (67-56-1)

California Proposition 65
This product contains a material, which the State of California has found to cause cancer, birth defects or other reproductive harm: Methanol

16. OTHER INFORMATION

NFPA Ratings
NFPA Code for Health - 1
NFPA Code for Flammability - 0
NFPA Code for Reactivity - 0
NFPA Code for Special Hazards - None

HMIS Ratings
HMIS Code for Health - *1
HMIS Code for Flammability - 0
HMIS Code for Physical Hazard - 0
HMIS Code for Personal Protection - See Section 8
*Chronic

16. OTHER INFORMATION

Legend
ACGIH: American Conference of Governmental Industrial Hygienists
CAS#: Chemical Abstracts Service Number
EC50: Effect Concentration 50%
ECHA: European Chemicals Agency
IARC: International Agency for Research on Cancer
LC50: Lethal Concentration 50%
LD50: Lethal Dose 50%
N/A: Denotes no applicable information found or available
OSHA: Occupational Safety and Health Administration
PEL: Permissible Exposure Limit
RQ: Reportable Quantity
STEL: Short Term Exposure Limit
TLV: Threshold Limit Value
TSCA: Toxic Substance Control Act

Revision Date: May 16, 2017
Replaces: Rev. B, Feb 16, 2016
Changes made: Updated to GHS Classification.

Information Source and References
This SDS is prepared by Hazard Communication Specialists based on information provided by internal company references.

Prepared By: EnviroNet LLC.
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