

Section 1: Product and Company Identification

Middlesex Gases & Technologies

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Product Code: HEXAFLUORO-1,3-BUTADIENE

Section 2: Hazards Identification



Danger

Hazard Classification:

Aspiration Hazard (Category 1)
Eye Effects (Category 2.B)
Flammable (Category 1)
Gases Under Pressure

Hazard Statements:

Causes eye irritation
Contains gas under pressure; may explode if heated
Extremely flammable gas
May be fatal if swallowed and enters airways

Precautionary Statements

Prevention:

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Wash thoroughly after handling.

Response:

Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Immediately call a poison center or doctor.
Eliminate all ignition sources if safe to do so.
Do NOT induce vomiting.
If swallowed: Rinse mouth. Do NOT induce vomiting.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage:

Protect from sunlight.

Store in well-ventilated place.
Store locked up.

Disposal:
Dispose of contents and/or container in accordance with applicable regulations.

Section 3: Composition/Information on Ingredients

CAS #
685-63-2

Chemical Substance	Chemical Family	Trade Names
HEXAFLUORO-1,3-BUTADIENE	aliphatic, halogenated hydrocarbons	1,1,2,3,4,4-HEXAFLUORO-1,3-BUTADIENE; 1,3-BUTADIENE, 1,1,2,3,4,4-HEXAFLUORO-; 1,1,2,3,4,4,-HEXAFLUOROBUTA-1,3-DIENE; 1,3-BUTADIENE, HEXAFLUORO-; HEXAFLUOROBUTA-1,3-DIENE; HEXAFLUOROBUTADIENE-1,3; PERFLUORO-1,3-BUTADIENE; PERFLUOROBUTA-1,3-DIENE; PERFLUOROBUTADIENE-1,3; PERFLUOROBUTADIENE; C4F6;

Section 4: First Aid Measures

Skin Contact	Eye Contact	Ingestion	Inhalation	Note to Physicians
Remove contaminated clothing. Flush with warm water. Consult a physician.	Flush eyes with warm water for at least 15 minutes. Consult a physician.	Not applicable route of exposure	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.	Treat symptomatically.

Section 5: Fire Fighting Measures

Suitable Extinguishing Media	Products of Combustion	Protection of Firefighters
Carbon dioxide, foam dry chemicals.	Oxides of carbon, hydrogen fluoride, carbonyl fluoride	▪ Self-contained breathing apparatus required.

Section 6: Accidental Release Measures

Personal Precautions	Environmental Precautions	Methods for Containment
In case of accidental release, wear self-contained breathing apparatus.	Prevent material from entering sewer or confined spaces.	Stop leak if possible without personal risk. Monitor leak area to ensure the concentration is below the Lower Explosive Limit (LEL - 7%)

Methods for Cleanup	Other Information
Reduce vapors with water spray. Dispose of residue in sealed containers according to all disposal regulations.	Evacuate unnecessary people from spill area immediately.

Section 7: Handling and Storage

Handling	Storage
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Handling	Storage
Store in cool, dry, well-ventilated area of non-combustible construction away from heavily traffic areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125 oF (52 oC).	Use in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<150 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder.

Section 8: Exposure Controls/Personal Protection

Exposure Guidelines
No occupational exposure limits established.

Engineering Controls

No specific controls are needed.

Eye Protection	Skin Protection	Respiratory Protection
Splash resistant safety goggles with a face shield.	Wear protective clothing.	Self-contained breathing apparatus required.

General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

Section 9: Physical and Chemical Properties

Physical State	Appearance	Color	Change in Appearance	Physical Form	Odor	Taste
Gas	Clear	Colorless	N/A	Compressed gas	Solvent-like odor	N/A

Flash Point	Flammability	Partition Coefficient	Autoignition Temperature	Upper Explosive Limits	Lower Explosive Limits
N/A	N/A	N/A	N/A	73%	7%

Boiling Point	Freezing Point	Vapor Pressure	Vapor Density	Specific Gravity	Water Solubility	pH	Odor Threshold	Evaporation Rate	Viscosity
-132°C (-205.6°F)	6°C (42.8°F)	@ 60°C (140°F): 69.6 psig	6.8 (Air=1)	1.553 @ -20 C	Insoluble	N/A	N/A	Not Applicable	N/A

Molecular Weight	Molecular Formula	Density	Weight per Gallon	Volatility by Volume	Volatility	Solvent Solubility
162.03	C4F6	6.79 @ 15 C	N/A	Not Applicable	Not Applicable	None

Section 10: Stability and Reactivity

Stability	Conditions to Avoid	Incompatible Materials
Stable under conditions of normal temperature and pressure.	Stable under conditions of normal temperature and pressure.	Alkali metals, combustible materials, metals, Oxidizers, oxygen

Hazardous Decomposition Products	Possibility of Hazardous Reactions
Oxides of carbon, hydrogen fluoride, fluorinated compounds, carbonyl fluoride	Will not polymerize.

Section 11: Toxicology Information

Acute Effects

Oral LD50	Dermal LD50	Inhalation
667 ppm/4 hour(s) Continuous inhalation-rat LC50 (Ausimont, Inc. Italy)	Not Available	Irritation, cough, irregular heartbeat, drowsiness, dizziness, damage to the kidneys

Eye Irritation	Skin Irritation	Sensitization
Irritation	Irritation	Harmful if inhaled, may be fatal.

Chronic Effects

Carcinogenicity	Mutagenicity	Reproductive Effects	Developmental Effects
Not established	Not expected	Not expected	No data

Section 12: Ecological Information

Fate and Transport

Eco toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environment
Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available

Section 13: Disposal Considerations

Dispose in accordance with local and federal regulations.

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

Proper Shipping Name	ID Number	Hazard Class or Division	Packing Group	Labeling Requirements	Passenger Aircraft or Railcar Quantity Limitations	Cargo Aircraft Only Quantity Limitations	Additional Shipping Description
Liquefied gas, toxic, flammable, n.o.s. (Perfluoro-1,3-Butadiene)	UN 3160	2.3, 2.1	Not Applicable	2.3, 2.1	Forbidden	Forbidden	Forbidden

Canadian Transportation of Dangerous Goods

Shipping Name	UN Number	Class	Packing Group / Risk Group
Liquefied gas, toxic, flammable, n.o.s. (HEXAFLUORO-1,3-BUTADIENE)	UN3160	2.3, 2.1	Not Applicable

Section 15: Regulatory Information

U.S. Regulations

CERCLA Sections	SARA 355.30	SARA 355.40
Not regulated.	Not regulated.	Not regulated.

SARA 370.21

Acute	Chronic	Fire	Reactive	Sudden Release
Yes	No	Yes	No	Yes

SARA 372.65

Not regulated.

OSHA Process Safety

Not regulated.

State Regulations

CA Proposition 65

Not regulated.

Canadian Regulations

WHMIS Classification

Not determined.

National Inventory Status

US Inventory (TSCA)	TSCA 12b Export Notification	Canada Inventory (DSL/NDSL)
Listed on inventory.	Not listed.	Not determined.

Section 16: Other Information

NFPA Rating

HEALTH=3 FIRE=4 REACTIVITY=0

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard