

Danger



SECTION 1: Identification of the hazardous chemical and of the supplier

1.1. Product identifier

Trade name : Hexafluoro-1,3-Butadiene
Name : Hexafluoro-1,3-Butadiene

1.2. Other means of identification

Product code : ALM/SDS/406

1.3. Recommended use of the chemical and restrictions on use

Recommended use : Industrial and professional use for chemical analysis, calibration, (routine) quality control, laboratory use, under controlled conditions
Perform risk assessment prior to use.

Restrictions on use : Consumer use.
Uses other than those listed above are not supported, contact your supplier for more information on other uses.

1.4. Supplier details

AIR LIQUIDE MALAYSIA SDN. BHD.
Lot PT 2317, No. 21, Jalan PTB 1
Kawasan Perindustrian Tangga Batu, Mukim Sungai Udang,
76400 Melaka
Malaysia
T +606-3513512

1.5. Emergency phone number

Emergency number : +606-3513512

SECTION 2: Hazards identification

2.1. Classification of the hazardous chemical

Classification according to Industry Code of Practice on chemicals classification and hazard communication (2019)

Flammable gases, Category 1	H220
Gases under pressure : Liquefied gas	H280
Acute toxicity (inhalation:gas) Category 3	H331
Specific target organ toxicity – Repeated exposure, Category 2	H373
Hazardous to the aquatic environment – Chronic Hazard, Category 3	H412

2.2. Label elements

Labelling according to Industry Code of Practice on chemicals classification and hazard communication (2019)

Hazard pictograms (GHS MY) :



Signal word (GHS MY) : Danger

Hazard statements (GHS MY) : H220 - Extremely flammable gas
H280 - Contains gas under pressure; may explode if heated

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Precautionary statements (GHS MY) :

- H331 - Toxic if inhaled
- H373 - May cause damage to organs through prolonged or repeated exposure
- H412 - Harmful to aquatic life with long lasting effects
- P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
- P260 - Do not breathe dust/fume/gas/mist/vapours/spray
- P261 - Avoid breathing dust/fume/gas/mist/vapours/spray
- P271 - Use only outdoors or in a well-ventilated area
- P273 - Avoid release to the environment
- P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
- P311 - Call a POISON CENTER or doctor/physician
- P314 - Get medical advice/attention if you feel unwell
- P321 - Specific treatment (see ... on this label)
- P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely
- P381 - Eliminate all ignition sources if safe to do so
- P403 - Store in a well-ventilated place
- P403+P233 - Store in a well-ventilated place. Keep container tightly closed
- P405 - Store locked up
- P410+P403 - Protect from sunlight. Store in a well-ventilated place
- P501 - Dispose of contents/container to ...

2.3. Other hazards that do not result in classification

Other hazards which do not result in classification : Not classified as PBT or vPvB, The substance/mixture has no endocrine disrupting properties.

SECTION 3: Composition and information of the ingredients of the hazardous chemical

3.1. Substances

Name : Hexafluoro-1,3-Butadiene

Name	Product identifier	%
Hexafluoro-1,3-Butadiene	CAS-No.: 685-63-2	100

Full text of H-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of necessary first aid measures

First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms/effects, acute and delayed

Most important symptoms and effects, both acute and delayed : See section 11.

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

Other medical advice or treatment : Obtain medical assistance.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media : Shutting off the source of the gas is the preferred method of control.

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Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Physicochemical hazards arising from the chemical

Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.
Hazardous combustion products : Carbon monoxide. Hydrogen fluoride.

5.3. Special protective equipment and precautions for fire fighters

Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. Standard EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

Specific methods : Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire, Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems, If possible, stop flow of product, Use water spray or fog to knock down fire fumes if possible, Move containers away from the fire area if this can be done without risk.

EAC code : 2XE

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment, and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Act in accordance with local emergency plan. Try to stop release. Evacuate area. Eliminate ignition sources. Ensure adequate air ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Stay upwind. See section 8 of the SDS for more information on personal protective equipment.

6.1.2. For emergency responders

Emergency procedures : Monitor concentration of released product. Consider the risk of potentially explosive atmospheres. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. See section 5.3 of the SDS for more information.

6.2. Environmental precautions

Try to stop release.

6.3. Methods and materials for containment and cleaning up

Methods and material for containment and cleaning up : Ventilate area.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Safe handling of the gas receptacle : Refer to supplier's container handling instructions. Do not allow backfeed into the container. Protect containers from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. If user experiences any difficulty operating valve discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the content of the container. Suck back of water into the container must be prevented. Open valve slowly to avoid pressure shock.

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Safe use of the product

: Assess the risk of potentially explosive atmospheres and the need for explosion-proof equipment. Purge air from system before introducing gas. Take precautionary measures against static discharge. Keep away from ignition sources (including static discharges). Consider the use of only non-sparking tools. Ensure equipment is adequately earthed. Avoid exposure, obtain special instructions before use. Installation of a cross purge assembly between the container and the regulator is recommended. The product must be handled in accordance with good industrial hygiene and safety procedures. Only experienced and properly instructed persons should handle gases under pressure. Consider pressure relief device(s) in gas installations. Ensure the complete gas system was (or is regularly) checked for leaks before use. Do not smoke while handling product. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Avoid suck back of water, acid and alkalis. Do not breathe gas. Avoid release of product into work area.

7.2. Conditions for safe storage, including any incompatibilities

Conditions for safe storage, including any incompatibilities

: Segregate from oxidant gases and other oxidants in store. All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere. Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Container valve guards or caps should be in place. Containers should be stored in the vertical position and properly secured to prevent them from falling over. Stored containers should be periodically checked for general condition and leakage. Keep container below 50°C in a well ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials.

SECTION 8: Exposure controls and personal protection

8.1. Control parameters

No additional information available

Exposure limit values for the other components

No additional information available

8.1.1 Biological monitoring

No additional information available

8.2. Appropriate engineering controls

Appropriate engineering controls

: Provide adequate general and local exhaust ventilation. Product to be handled in a closed system. Consider the use of a work permit system e.g. for maintenance activities. Gas detectors should be used when toxic gases may be released. Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits (where available).

8.3. Individual protection measures, such as PPE

Hand protection:

Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risks, performance level 1 or higher.

Eye protection:

Wear goggles when transfilling or breaking transfer connections. Standard EN 166 - Personal eye-protection - specifications

Respiratory protection:

Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems. Keep self contained breathing apparatus readily available for emergency use. Consult respiratory device supplier's product information for the selection of the appropriate device. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. When indicated by a risk assessment, Respiratory Protective Equipment must be used. The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD.

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Personal protective equipment symbol(s):



Thermal hazard protection

: None in addition to the above sections.

Environmental exposure controls

: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

SECTION 9: Physical and chemical properties

Physical state	: Gas
Appearance	: No data available
Colour	: Colourless
Odour	: Odourless.
Odour threshold	: Odour threshold is subjective and inadequate to warn of overexposure.
pH	: Not applicable for gases and gas mixtures.
Melting point	: Not applicable for gases and gas mixtures.
Freezing point	: No data available
Boiling point	: .Not applicable for gas mixtures.
Flash point	: Not applicable for gases and gas mixtures.
Evaporation rate	: No data available
Flammability (solid, gas)	: Flammable gas.
Explosive limits	: Flammability range not available.
Vapour pressure	: Vapour pressure: Not known.
Relative vapour density at 20°C	: Not applicable for gases and gas mixtures.
Relative density	: Relative gas density: Heavier than air.
Solubility	: No data available
Partition coefficient n-octanol/water (Log Pow)	: .Not applicable for gas mixtures.
Partition coefficient n-octanol/water (Log Kow)	: No data available
Auto-ignition temperature	: Not known.
Decomposition temperature	: Not applicable.
Viscosity, kinematic	: Not applicable for gases and gas mixtures.
Viscosity, dynamic	: Not applicable for gases and gas mixtures.
Oxidising properties	: No oxidising properties.
Additional information	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

Reactivity	: Data for mixtures are not available
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Can form explosive mixture with air,May react violently with oxidants.
Conditions to avoid	: Keep away from heat/sparks/open flames/hot surfaces. – No smoking,Avoid moisture in installation systems.
Incompatible materials	: Air, Oxidisers,For additional information on compatibility refer to ISO 11114.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Toxic if inhaled.

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Hexafluoro-1,3-Butadiene (685-63-2)	
LC50 Inhalation - Rat [ppm]	650 ppm/4h

Skin corrosion or irritation	: Not classified pH: Not applicable for gases and gas mixtures.
Serious eye damage or eye irritation	: Not classified
Respiratory sensitization	: Not classified
Skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (STOT) – single exposure	: Not classified
Specific target organ toxicity (STOT) – repeated exposure	: May cause damage to organs through prolonged or repeated exposure.

Hexafluoro-1,3-Butadiene (685-63-2)	
Specific target organ toxicity (STOT) – repeated exposure	May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard : Not classified

Hexafluoro-1,3-Butadiene	
Viscosity, kinematic	Not applicable for gases and gas mixtures.

Other information : The substance/mixture has no endocrine disrupting properties.

SECTION 12: Ecological information

12.1. Ecotoxicity

Ecology - general	: Harmful to aquatic life with long lasting effects.
Hazardous to the aquatic environment, short-term (acute)	: Not classified
Hazardous to the aquatic environment, long-term (chronic)	: Harmful to aquatic life with long lasting effects.

Hexafluoro-1,3-Butadiene	
Partition coefficient n-octanol/water (Log Pow)	.Not applicable for gas mixtures.

Hexafluoro-1,3-Butadiene (685-63-2)	
Partition coefficient n-octanol/water (Log Kow)	Not known.

12.2. Persistence and degradability

Hexafluoro-1,3-Butadiene	
Persistence and degradability	No data available.

12.3. Bioaccumulative potential

Hexafluoro-1,3-Butadiene	
Partition coefficient n-octanol/water (Log Pow)	.Not applicable for gas mixtures.
Bioaccumulative potential	No data available.

Hexafluoro-1,3-Butadiene (685-63-2)	
Partition coefficient n-octanol/water (Log Kow)	Not known.

12.4. Mobility in soil

Hexafluoro-1,3-Butadiene	
Mobility in soil	No additional information available
Partition coefficient n-octanol/water (Log Pow)	.Not applicable for gas mixtures.

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Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.
Hexafluoro-1,3-Butadiene (685-63-2)	
Partition coefficient n-octanol/water (Log Kow)	Not known.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

12.5. Other adverse effects



Ozone	: Not classified
GWPMix comment	: No known effects from this product.
Effect on the ozone layer	: No effect on the ozone layer.
Other adverse effects	: No known effects from this product.

SECTION 13: Disposal information

13.1. Disposal methods

Waste treatment methods	: Contact supplier if guidance is required. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Ensure that the emission levels from local regulations or operating permits are not exceeded. Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at http://www.eiga.eu for more guidance on suitable disposal methods. Must not be discharged to atmosphere. Return unused product in original container to supplier.
Additional information	: External treatment and disposal of waste should comply with applicable local and/or national regulations.

SECTION 14: Transportation information

IMDG	IATA	UNRTDG
14.1. UN number		
3160	3160	3160
14.2. UN proper shipping name		
LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.	Liquefied gas, toxic, flammable, n.o.s.	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.
14.3. Transport hazard class(es)		
2.3 (2.1)	2.3 (2.1)	2.3 (2.1)
 2	Not applicable	 2
14.4. Packing Group, if applicable		
Not applicable	Not applicable	Not applicable
14.5. Environmental hazards		
Dangerous for the environment: No Marine pollutant: No	Dangerous for the environment: No	Dangerous for the environment: No
No supplementary information available		

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14.6. Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment, Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency, Before transporting product containers: - Ensure there is adequate ventilation, - Ensure that containers are firmly secured, - Ensure valve is closed and not leaking, - Ensure valve outlet cap nut or plug (where provided) is correctly fitted, - Ensure valve protection device (where provided) is correctly fitted.

UN RTDG

Special provisions (UN RTDG) : 274
Limited quantities (UN RTDG) : 0
Excepted quantities (UN RTDG) : E0
Packing instruction (UN RTDG) : P200

IMDG

Special provisions (IMDG) : 274
Limited quantities (IMDG) : 0
Excepted quantities (IMDG) : E0
Packing instructions (IMDG) : P200
EmS-No. (Fire) : F-D - FIRE SCHEDULE Delta - FLAMMABLE GASES
EmS-No. (Spillage) : S-U - SPILLAGE SCHEDULE Uniform - GASES (FLAMMABLE, TOXIC OR CORROSIVE)
Stowage category (IMDG) : D
Stowage and handling (IMDG) : SW2

IATA

PCA Limited quantities (IATA) : Forbidden
PCA limited quantity max net quantity (IATA) : Forbidden
PCA packing instructions (IATA) : Forbidden
PCA max net quantity (IATA) : Forbidden
CAO packing instructions (IATA) : Forbidden
CAO max net quantity (IATA) : Forbidden
Special provisions (IATA) : A2
ERG code (IATA) : 10P

14.7. Special precautions for user

IBC code : Not applicable.

14.8. Hazchem or Emergency Action Code

EAC code : 2XE.

SECTION 15: Regulatory information

15.1. Safety, health, and environmental regulations specific for the hazardous chemical in question

EHS Notification and Registration Scheme	Not applicable
EHS Notification and Registration Scheme	Not applicable
Environmental Quality (Chlorofluorocarbons Prohibition) Order 1993	
Environmental Quality (Industrial Effluent) Regulations 2009	
Environmental Quality (Scheduled Wastes) Regulations 2007	
Control of Industrial Major Accident Hazards Regulations 1996	
Prohibition of Use of Substance Order 1999	
Use and Standards of Exposure of Chemical Hazardous to Health Regulations 2000	
Chemical Weapons Convention Act	
Corrosive and Explosive Substances and Offensive Weapons Act	

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Dangerous Drugs Act	
Pesticides Act	
Petroleum (Safety Measures) Act	
Poisons Act 1952	
Poisons (Psychotropic Substances) Regulations 1989	

15.2. International agreements

No additional information available

SECTION 16: Other information

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Abbreviations and acronyms : ATE - Acute Toxicity Estimate
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
EINECS - European Inventory of Existing Commercial Chemical Substances
CAS# - Chemical Abstract Service number
PPE - Personal Protection Equipment
LC50 - Lethal Concentration to 50 % of a test population
RMM - Risk Management Measures
PBT - Persistent, Bioaccumulative and Toxic
vPvB - Very Persistent and Very Bioaccumulative
STOT- SE : Specific Target Organ Toxicity - Single Exposure
CSA - Chemical Safety Assessment
EN - European Standard
UN - United Nations
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road
IATA - International Air Transport Association
IMDG code - International Maritime Dangerous Goods
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail
WGK - Water Hazard Class
STOT - RE : Specific Target Organ Toxicity - Repeated Exposure
UFI : Unique Formula Identifier

Training advice : Ensure operators understand the flammability hazard. Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard.

Other information : Classification using data from databases maintained by the European Industrial Gases Association (EIGA). Data is maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at : <http://www.eiga.eu>. Classification in accordance with the procedures and calculation methods of Regulation (EC) 1272/2008 (CLP).

Safety Data Sheet (SDS), Malaysia_AL

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.