



## Material Safety Data Sheet

### Section 1- Product and Company Identification

Synonyms: Hexafluoropropene

Chemical Name: Hexafluoropropylene

Formula: C<sub>3</sub>F<sub>6</sub>

TDG (Canada) CLASSIFICATION: 2.2

WHMIS CLASSIFICATION: A

Supplier Name: Miragas Co. Ltd.

Address of Supplier: Zhucun Industrial Park, Pengpo, Yichuan, Luoyang, Henan 471311, China

Telephone Number: +86 379-69581176

Emergency Telephone Number: +86 379-69581179

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Email address: [Bureau@miragases.com](mailto:Bureau@miragases.com)

### Section 2- Composition/information on ingredients

COMPOSITION: 99.9 %

PEL-OSHA<sup>1</sup>: None Established

CAS NUMBER: 116-15-4

TLV-ACGIH<sup>2</sup>: None Established

RTECS #: UD0350000

LD<sub>50</sub> or LC<sub>50</sub> Route/Species: Not Available

Formula: C<sub>3</sub>F<sub>6</sub>

<sup>1</sup> As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993).

<sup>2</sup> As stated in the ACGIH 1996-97 Threshold Limit Values for Chemical Substances and Physical Agents.

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

This product does not contain oxygen and may cause asphyxia if released in a confined area. Low concentrations may cause transient eye, nose, and throat irritation. Inhalation of high concentrations have been associated with irregular heart beat and pulmonary edema. Nonflammable. Thermal decomposition will produce toxic F-.

#### ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
Yes	No	Yes	Yes	No

#### HEALTH EFFECTS:

Exposure Limits	Irritant	Sensitization
No	Yes	No



Teratogen No	Reproductive Hazard No	Mutagen No
Synergistic Effects None Reported		

## Carcinogenicity:

NTP: No      IARC: No      OSHA: No

## EYE EFFECTS:

Exposure may cause eye irritation.

## SKIN EFFECTS:

High concentrations may cause irritation. Prolonged or repeated contact may tend to dry or defat the skin and cause irritation or dermatitis.

INGESTION EFFECTS: Ingestion is unlikely as product is a gas.

INHALATION EFFECTS: Inhalation of low concentrations may cause transient nose and throat irritation. Inhalation of high concentrations may cause bronchial constriction, cough, dyspnea, chest tightness and pulmonary edema. High concentrations may cause the heart to beat irregularly and stop. Oxygen deficiency may occur in the presence of high concentrations resulting in asphyxiation. Maintain oxygen levels above 19.5%.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing heart condition.

## NFPA HAZARD CODES

Health: 1

Flammability: 0

Reactivity: 0

## HMIS HAZARD CODES

Health: 1

Flammability: 0

Reactivity: 0

## RATINGS SYSTEM

0 = No Hazard

1 = Slight Hazard

2 = Moderate Hazard

3 = Serious Hazard

4 = Severe Hazard

## Section 4- First Aid Measures

## EYES:

Flush eyes with large amounts of lukewarm water for 15 minutes. If light sensitivity, pain, swelling, or tearing persist, refer the victim to an ophthalmologist for treatment and follow up.

## SKIN:

Remove contaminated clothing and flush affected areas with lukewarm water. If irritation persists, seek medical attention.

## INGESTION:

Unlikely as product is a gas at room temperature.

**INHALATION:**

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVER EXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Remove victim to fresh air. Administer artificial respiration if breathing has stopped and supplement with oxygen by a trained individual. Further treatment should be symptomatic and supportive. Seek medical attention as soon as possible for follow up treatment. Remove to fresh air. If necessary, give oxygen or provide artificial respiration. Call a physician.

**NOTE TO PHYSICIAN:**

A patient adversely affected by exposure to this product should not be given adrenalin (epinephrine) or similar heart stimulant since these would increase the risk of cardiac arrhythmias.

Section 5- Fire-Fighting Measures
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Conditions of Flammability: Nonflammable		
Flash point: None	Method: Not Applicable	Autoignition Temperature: None
LEL(%): None	UEL(%): None	
Hazardous combustion products: None. Decomposes to toxic gases at fire temperatures		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

**FIRE AND EXPLOSION HAZARDS:**

Thermal decomposition may produce toxic F- and other oxidation products.

Cylinder may rupture or explode from pressure when involved in a fire situation.

**EXTINGUISHING MEDIA:**

For small fires, use dry chemical, carbon dioxide or halon. Water spray, fog, or standard foam are recommended for large fires.

**FIRE FIGHTING INSTRUCTIONS:**

Firefighters should wear a NIOSH/MSHA approved full-facepiece self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout or bunker gear. Additional chemical protective clothing may be required to protect against toxic decomposition products.

Section 6- Accidental Release Measures
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Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest Miragas location.

Section 7- Handling and Storage
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Product Shelf life: 12 months



Product is non-corrosive and may be used with any common structural material. Silver and carbon bearing alloys can act as catalysts for decomposing the product at high temperatures. Alloys containing more than 2% magnesium should not be used if water is present.

Use only 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.

Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Protect cylinders from physical damage.

Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125 °F (52 °C).

Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time. For additional handling recommendations, consult MIRAGAS Pamphlet P-1. Handle with reasonable care.

Store in a cool, dry place. Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

#### Section 8- Exposure Controls/Personal Protection

##### EXPOSURE LIMITS<sup>1</sup>:

INGREDIENT	% VOLUME	PEL-OSHA <sup>2</sup>	TLV-ACGIH <sup>3</sup>	LD <sub>50</sub> or LC <sub>50</sub> Route/Species
Hexafluoropropylene Formula: C <sub>3</sub> F <sub>6</sub> CAS: 116-15-4 RTECS#: UD0350000	99.9	None Established	None Established	Not Available

<sup>1</sup> Refer to individual state of provincial regulations, as applicable, for limits which may be more stringent than those listed here.

<sup>2</sup> As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)

<sup>3</sup> As stated in the ACGIH 1996-1997 Threshold Limit Values for Chemical Substances and Physical Agents.

##### ENGINEERING CONTROLS:

General ventilation used in combination with local exhaust as necessary to prevent irritation and maintain atmospheric oxygen levels to 19.5%.

**EYE/FACE PROTECTION:**

Safety glasses as suitable for the job.

**SKIN PROTECTION:**

Plastic or rubber gloves as necessary to prevent irritation.

**RESPIRATORY PROTECTION:**

A Type C respirator with full-face piece equipped with an escape bottle or a self-contained breathing apparatus should be available for emergency use. Operate this equipment in the positive pressure demand mode.

**OTHER/GENERAL PROTECTION:**

Safety shoes, eyewash "fountain."

Section 9- Physical and Chemical Properties
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PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure at 70 °F	:	psia
Vapor density (Air = 1)	:	
Evaporation point	: Not applicable	
Boiling point	: -21	°F
	: -29.4	°C
Freezing point	:	°F
	: -156.2	°C
pH	: Not Applicable	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H <sub>2</sub> O)	: Very soluble	
Odor threshold	: Not Available	
Odor and appearance	: Gas	

Section 10- Stability and Reactivity
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**STABILITY:**

Stable

**INCOMPATIBLE MATERIALS:**

Reacts explosively with Grignard reagents (i.e.: phenyl-magnesium bromide). Reacts with tetrafluoroethylene in air to form explosive peroxides.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

Thermal decomposition will produce toxic F- and other oxidation products.

**HAZARDOUS POLYMERIZATION:**

Will not occur.

**Section 11- Toxicological Information**

**INHALATION:** Male Fischer-344 rats who inhaled 380-1200 ppm hexafluoropropene for 4 hours within 2 days exhibited dose-related proximal tubular necrosis, diuresis, increase in urinary fluoride, urinary lactic dehydrogenase (LDH) activity, serum creatinine and blood nitrogen (urea).

**EYE:** Ocular instillation of fluorinated hydrocarbons has produced corneal burns in rabbits.

**SKIN:** Accidental injection of freons can cause pain, erythema and edema.

**OTHER:** Increased urinary fluoride has been observed in male rats exposed to air containing sublethal concentrations of hexafluoropropene. Positive dose-related trends were observed in numbers of aberrations/cell, percentage of abnormal cells and percentage of cells with > 1% aberration in Chinese hamster ovary (CHO) cells in vitro both in the presence and absence of rat liver S9 metabolic activation.

**Section 12- Ecological Information**

No data given.

**Section 13- Disposal Considerations**

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container **PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE** to MIRAGAS or authorized distributor for proper disposal.

**Section 14- Transport Information**

**DOT/IMO SHIPPING NAME:** Hexafluoropropylene

**HAZARD CLASS:** 2.2

**IDENTIFICATION NUMBER:** UN 1858

**PRODUCT RQ:** None

**SHIPPING LABEL(s):** NONFLAMMABLE GAS

**PLACARD (when required):** NONFLAMMABLE GAS

**Section 15- Regulatory Information**

**SARA TITLE III NOTIFICATIONS AND INFORMATION**

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**SARA TITLE III - HAZARD CLASSES:**

Sudden Release of Pressure Hazard

**SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION; SARA 302 (EHS); CERCLA:**



This product does not contain toxic chemicals subject to the reporting requirements of section 313 or CERCLA (Section 304) release reporting requirements. Octafluorocyclobutane is not listed as an Extremely Hazardous Substance (EHS) under Section 302 of SARA.

Section 16- Other Information
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Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

**DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:**

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose.

NOTES: Revisions are routinely updated every three years or on necessary.