

# SDS – SAFETY DATA SHEET

## 1. IDENTIFICATION

**Product Identifier:** 1-CHLORO-2,2,2-TRIFLUOROETHYL DIFLUOROMETHYL ETHER (26675-46-7)

**Synonyms:** Isoflurane

**Chemical Formula:** C<sub>3</sub> H<sub>2</sub> ClF<sub>5</sub> O

**Recommended Use of the Chemical:** Industrial Chemical Use

**Manufacturer / Supplier:** HALOCARBON PRODUCTS CORPORATION

**Address:** 1100 Dittman Court North Augusta, SC

**Website:** [www.halocarbon.com](http://www.halocarbon.com)

**Email:** EHSTech@Halocarbon.com

**Phone:** (803) 278-3504

**Emergency CHEMTREC Phone:** (800) 424-9300 United States / 001-703-527-3887 International and Maritime

## 2. HAZARD(S) IDENTIFICATION

### Classification of the Substance or Mixture:

Acute toxicity, Oral (Category 5)

Acute toxicity, Dermal (Category 5)

Eye Damage / Irritation (Category 2B)

Specific target organ toxicity - single exposure (Category 3), Central nervous system

Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Cardio-vascular system, Central nervous system

### Risk Phrases:

R48/20: Danger of serious damage to health by prolonged exposure. Harmful by inhalation.

R36: Irritating to eyes.

R67: Vapors may cause drowsiness and dizziness.

### Label Elements:

**Signal Word:** Warning



### Hazard Statements:

H303: May be harmful if swallowed.

H313: May be harmful in contact with skin.

H320: Causes eye irritation.

H336: May cause drowsiness or dizziness.

H373: May cause damage to organs (Cardio-vascular system, Central nervous system) through prolonged or repeated exposure if inhaled.

### Precautionary Statements:

P261: Avoid breathing vapors.

P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301+310: IF SWALLOWED: Immediately call a POISON CENTER or doctor / physician.

P302+352: IF ON SKIN: Wash with soap and 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.

### 3. COMPOSITION INFORMATION / INGREDIENTS

Ingredient	CAS Number	EC Number	Percent
Isoflurane	26675-46-7	247-897-7	100%

### 4. FIRST-AID MEASURES

Show this safety data sheet to the doctor in attendance. Consult a physician. Inhalation may cause anesthesia.

**Inhalation:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give Oxygen. If symptoms persist, consult a physician. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

**Ingestion:** Never give anything by mouth to an unconscious person. Rinse mouth. Drink 1 or 2 glasses of water. Induce vomiting, but only if victim is fully conscious. Consult a physician.

**Skin Contact:** In case of contact, wash off immediately with soap and plenty of water. Consult a physician.

**Eye Contact:** Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Remove contact lenses, if present and easy to do. Consult a physician.

### 5. FIRE-FIGHTING MEASURES

**Fire:** Not flammable.

**Explosion:** Not combustible.

**Fire Extinguishing Media:** Use water spray, Alcohol-resistant foam, dry chemical or Carbon Dioxide.

**Special Information:** In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

### 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions, Protective Equipment and Emergency Procedures:** Avoid breathing vapors, mist or gas. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering.

**Environmental Precautions and Methods and Materials for Containment and Cleaning Up:**

**Small spillage:** Allow to evaporate. Isolate area until gas has dispersed.

**Large spillage:** Contain and recover liquid when possible. Do not let product enter drains. Collect liquid in an appropriate container or absorb with an inert material (e. g., sand, silica gel, acid binder, universal binder, sawdust) and place in a chemical waste container. Do not flush to sewer!

### 7. HANDLING AND STORAGE

**Precautions for Safe Handling:** Wear personal protective equipment. Ensure adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Do not breathe vapors or spray mist. Avoid contact with skin and eyes.

**Conditions for Safe Storage, Including Any Incompatibilities:** Protect against physical damage. Keep container tightly closed in a dry and well-ventilated location. Keep at temperatures between 15 and 30C (59 and 86F.) Keep out of reach of children.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Airborne Exposure Limits:

**United States:** No OSHA or ACGIH exposure limits have been established. Safe work practices should always be followed.

**United Kingdom:** STEL: 150 ppm, 1149 mg/m<sup>3</sup>; TWA: 50 ppm, 383 mg/m<sup>3</sup>

**Spain:** VLA-ED: 50 ppm, 383 mg/m<sup>3</sup>

**Netherlands:** MAC: 20 ppm, 153 mg/m<sup>3</sup>

**Finland:** TWA: 10 ppm, 77 mg/m<sup>3</sup>; STEL: 20 ppm, 150 mg/m<sup>3</sup>

**Austria:** STEL: 20 ppm, 160 mg/m<sup>3</sup>; MAK: 10 ppm, 80 mg/m<sup>3</sup>

**Switzerland:** STEL: 80 ppm, 616 mg/m<sup>3</sup>; MAK: 10 ppm, 77 mg/m<sup>3</sup>

**Poland:** NDS: 32 mg/m<sup>3</sup>

**Norway:** TWA: 2 ppm, 15 mg/m<sup>3</sup>; STEL: 4 ppm, 22.5 mg/m<sup>3</sup>

**Ireland:** TWA: 50 ppm, 380 mg/m<sup>3</sup>

**Ventilation System:** A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):** Maintain adequate ventilation. In case of insufficient ventilation, wear a positive-pressure supplied-air respirator.

**Skin Protection:** Long sleeved clothing. Protective gloves / Nitrile rubber.

**Eye Protection:** Use chemical safety goggles and / or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** Clear, colorless liquid

**Odor:** Slight, pungent

**Odor Threshold:** Not determined

**pH:** No data available

**Melting Point:** No data available

**Boiling Point / Boiling Range:** 48.5C (119F)

**Flash Point:** Not applicable

**Evaporation Rate (BuAC=1):** No data available

**Flammability:** Not flammable

**Upper / Lower Flammability or Explosive Limits:** Not applicable

**Vapor Pressure (mm Hg):** 330 mmHg @ 20C (68F)

**Vapor Density (Air=1):** > 1

**Relative Density:** 1.5

**Solubility:** Negligible

**Partition Coefficient: n-octanol / water:** log Pow: 2.271

**Auto-ignition Temperature:** Not applicable

**Decomposition Temperature:** No data available

**Viscosity:** No data available

## 10. STABILITY AND REACTIVITY

**Reactivity and / or Chemical Stability:** Stable under ordinary conditions of use and storage.

**Possibility of Hazardous Reactions and Conditions to Avoid:** See Incompatible Materials.

**Incompatible Materials:** Alkali metals, powdered Aluminum, powdered Magnesium, powdered Zinc.

**Hazardous Decomposition Products:** May emit toxic fumes under fire conditions: Hydrofluoric Acid, Hydrogen Chloride gas, Carbonyl Fluoride.

## 11. TOXICOLOGICAL INFORMATION

**Emergency Overview:** Inhalation of high concentrations may cause: anesthesia, hypotension, coma, respiratory difficulties, apnea, seizures.

**Potential Health Effects:**

**Inhalation:** Vapors may irritate throat and respiratory system. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and in-coordination.

**Ingestion:** Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May cause additional affects as listed under "Inhalation."

**Skin Contact:** May cause irritation.

**Eye Contact:** Contact with eyes may cause irritation.

**Chronic Exposure:** No data available.

**Aggravation of Pre-existing Conditions:** No data available.

**Specific Target Organ Toxicity - Single Exposure (Globally Harmonized System):** Inhalation - May cause drowsiness or dizziness.

**Specific Target Organ Toxicity - Repeated Exposure (Globally Harmonized System):** Inhalation - May cause damage to organs through prolonged or repeated exposure - Cardio-vascular system, Central nervous system.

**Germ Cell Mutagenicity:** No data available.

**Reproductive Toxicity:** No data available.

**Aspiration Hazard:** No data available.

**Numerical Measures of Toxicity:** Cancer Lists: NTP Carcinogen

Ingredient	Known	Anticipated	IARC Category
1-Chloro-2,2,2-Trifluoroethyl Difluoromethyl Ether (26675-46-7)	No	No	None

**Acute Toxicity:**

LD50 / Oral 4770 mg/kg (rat); LC50 / Inhalation (VAPOR) LC50 / inhalation: 15,300 ppm (rat)

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity:** The environmental impact of this product has not been fully investigated.

**Persistence and Degradability:** No data available.

**Bioaccumulative Potential:** Bioaccumulation is unlikely.

**Mobility in Soil:** The product is insoluble and sinks in water. The product evaporates readily.

**Results of PBT and vPvB assessment:** No data available.

**Other adverse effects:** An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

## 13. DISPOSAL CONSIDERATIONS

Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. TRANSPORT INFORMATION

**UN Number:** UN3334

**UN Proper Shipping Name:** Aviation regulated liquid, n.o.s. (1-Chloro-2,2,2-Trifluoroethyl Difluoromethyl Ether)

**Land Transport ADR/RID and GGVS/GGVE (Cross Border / Domestic)**

**Packing Group:** -

**Transport Hazard Class(es):** 9

**Maritime Transport IMDG/GGVSea**

Not dangerous goods

**Marine Pollutant:** No

**Air Transport ICAO-TI and IATA-DGR**

**Packing Group:** - III

**Transport Hazard Class(es):** 9

**Transport in Bulk (according to Annex II of MARPOL 73/78 and the IBC Code):** Not applicable

**Special Precautions for User:** No additional information

## 15. REGULATORY INFORMATION

**Chemical Inventory Status – Part 1**

Ingredient	TSCA	EC	Japan	Australia
Isoflurane (26675-46-7)	LVE	Complies	No	No

**Chemical Inventory Status – Part 2**

Ingredient	Korea	Canada		Phil.
		DSL	NDSL	
Isoflurane (26675-46-7)	No	No	No	No

**Federal, State & International Regulations - Part 1**

Ingredient	SARA 302		SARA 313	
	RQ	TPQ	List Chemical	Catg.
Isoflurane (26675-46-7)	No	No	No	No

**Federal, State & International Regulations - Part 2**

Ingredient	RCRA		TSCA
	CERCLA	261.33	8(d)
Isoflurane (26675-46-7)	No	No	No

<b>Chemical Weapons Convention:</b> No	<b>TSCA 12(b):</b> No		<b>CDTA:</b> No
<b>SARA 311/312:</b>	<b>Acute:</b> No	<b>Chronic:</b> No	<b>Fire:</b> No
<b>Reactivity:</b> No	<b>Pressure:</b> No		
	Pure / Liquid		

**Poison Schedule:** S4

## 16. OTHER INFORMATION

*Effective:* 06/15/2015

*Previous Revisions:* 12/06/2002 – First Issue

**Disclaimer:** Halocarbon believes the information given here to be correct. However, we cannot guarantee its accuracy or be responsible for loss or damage that result from the use of such information.