SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product identifier

Chemical Name: 1,1,1,3,3,3-Hexafluoro-2-methoxypropane

CAS No.: 13171-18-1

Trade Name: HFMOP; HFE-356mmz1

Product Code: None

Relevant identified uses of the substance or mixture and uses advised against

Identified Use(s): Solvent in vapor degreasing / vapor cleaning

Uses Advised Against: See 49 CFR 721.11342

Identity of manufacturer/importer and other suppliers

Company Identification: Halocarbon Life Sciences, LLC

6525 The Corners Parkway; Suite 200

Peachtree Corners, GA  20092

Telephone: (470) 419-6363

E-Mail (competent person): sds@halocarbon.com

Emergency telephone number

Emergency Phone No.: CHEMTREC 24 hr. 1-800-424-9300 / 1 (703) 527-3887

Collect calls accepted

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

OSHA HCS (29 CFR 1910.1200)

Specific target organ toxicity — single exposure: Category 3

Label elements

Hazard Symbol: WARNING

Signal Word(s): H336: May cause drowsiness or dizziness.

Hazard Statement(s): P261: Avoid breathing vapours.

Precautionary Statement(s): P280: Wear protective gloves/protective clothing/eye protection/face protection.

P264: Wash hands and exposed skin thoroughly after handling.


P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337+P313: If eye irritation persists: Get medical advice/attention.

P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. P363: Wash contaminated clothing before reuse.

P102: Keep out of reach of children.

Avoid exposure during pregnancy.
Other hazards

Similar substances have produced reproductive and/or developmental effects in laboratory animals or have been implicated in higher than normal incidences of problem pregnancies among persons exposed to anesthetic gases of this type.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>% wt.</th>
<th>CAS No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1,1,3,3,3-Hexafluoro-2-methoxypropane (HFMOP) *</td>
<td>&gt; 99.9</td>
<td>13171-18-1</td>
</tr>
</tbody>
</table>

* Common name(s), synonym(s) of the substance: HFMOP; Propane, 1,1,1,3,3,3-hexafluoro-2-methoxy-; HFE-356mmz1

### SECTION 4: FIRST AID MEASURES

**Description of first aid measures**

<table>
<thead>
<tr>
<th>Description</th>
<th>Ingestion</th>
<th>Skin Contact</th>
<th>Eye Contact</th>
<th>Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most important symptoms and effects, both acute and delayed</td>
<td>None known.</td>
<td>None known.</td>
<td>None known.</td>
<td>Not normally required. Move person to fresh air. If breathing is laboured, administer oxygen. If symptoms develop, obtain medical attention.</td>
</tr>
</tbody>
</table>

**Indication of any immediate medical attention and special treatment needed**

None known.

### SECTION 5: FIRE-FIGHTING MEASURES

**Extinguishing Media**

- Suitable Extinguishing Media: Non-flammable / Non-combustible. As appropriate for surrounding fire.
- Unsuitable Extinguishing Media: None known.

**Special hazards arising from the substance or mixture**: None known.

**Advice for fire-fighters**: A self contained breathing apparatus and suitable protective clothing should be worn in fire conditions.

**Hazardous decomposition product(s)**: Thermal decomposition products include: Carbon monoxide, Carbon dioxide, and hydrogen fluorides.

### SECTION 6: ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures**: Wear protective gloves/eye protection. Avoid breathing mist/vapors/spray.
Environmental precautions
Avoid run off to waterways and sewers.

Methods and material for containment and cleaning up
Follow the Spill clean up guidelines as suggested in the Hazardous and non-hazardous waste regulations. Transfer to a container for disposal or recovery.

Reference to other sections
See Section: 7 - Incompatible materials

Additional Information
None

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Wear protective gloves/eye protection/face protection. Wash hands and exposed skin thoroughly after handling. Avoid breathing vapors. Avoid exposure during pregnancy. See Section: 11

Hygiene Measures
Wash hands and exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product.

Environmental Exposure Controls
Avoid release to the environment. Keep containers properly sealed when not in use. Avoid run off to waterways and sewers.

Conditions for safe storage, including any incompatibilities
- Storage temperature
  Store at room temperature. Keep only in original or other compatible container.

- Incompatible materials
  Strong oxidising agents.

Specific end use(s)
Cleaning / degreasing solvent

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

<table>
<thead>
<tr>
<th>SUBSTANCE</th>
<th>(8hr TWA)</th>
<th>STEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PEL (OSHA)</td>
<td>TLV (ACGIH)</td>
</tr>
<tr>
<td>None</td>
<td>-----</td>
<td>-----</td>
</tr>
</tbody>
</table>

Recommended monitoring method
OSHA Method 106. Portable flame-ionization detectors are suitable for area monitoring.

Exposure controls
To ensure compliance with 49 CFR 721.11342, use only with adequate ventilation or closed system ventilation. Use closed dosing, transfer, sampling and application systems including connectors. Formulate in enclosed or ventilated mixing vessels. **Contact supplier for specific control measures required for loading transport containers.**

Personal protection equipment
Eye/face protection
Wear protective eyewear (goggles, face shield, or safety glasses).
**Skin protection (Hand protection/ Other)**

Wear protective gloves. (Neoprene)

**Respiratory protection**

Not normally required. In poorly ventilated areas or confined spaces, use an airline respirator or self-contained breathing apparatus.

**Environmental Exposure Controls**

Avoid release to the environment. Keep containers properly sealed when not in use. Avoid run off to waterways and sewers.

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**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

**Information on basic physical and chemical properties**

- **Appearance**: Liquid
- **Color**: Clear Colourless
- **Odor**: Not available
- **Odor Threshold (ppm)**: Not available
- **pH (Value)**: Not available
- **Melting Point (°C) / Freezing Point (°C)**: Not available
- **Boiling point/boiling range (°C)**: 50 (122 °F)
- **Flash Point (°C)**: > 93 (> 200 °F) - Did not flash.
- **Evaporation Rate**: Not available
- **Flammability (solid, gas)**: Not applicable
- **Explosive Limit Ranges**: Not applicable
- **Vapour pressure (Pascal)**: 0.36, 1000 @ 25 °C (270.8 mmHg @ 77 °F)
- **Vapour Density (Air=1)**: Not applicable
- **Density (g/ml)**: 1.38 (11.5 lb/gal)
- **Solubility (Water)**: 0.0014 g/ml
- **Solubility (Other)**: Not available
- **Partition Coefficient (n-Octanol/water)**: Not available
- **Auto Ignition Point (°C)**: Not available
- **Decomposition Temperature (°C)**: Not available
- **Kinematic Viscosity (cSt)**: 0.36 @ 23 °C
- **Explosive properties**: Not explosive.
- **Oxidizing properties**: Not oxidizing.

**Other information**: Not available

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**SECTION 10: STABILITY AND REACTIVITY**

**Reactivity**: Stable under normal conditions.

**Chemical stability**: Stable.

**Possibility of hazardous reactions**: None anticipated.

**Conditions to avoid**: Incompatible materials

**Incompatible materials**: Strong oxidising agents, Alkalis and alkali metals, Aluminum, Zinc, Alkaline earth metals.

**Hazardous decomposition product(s)**: Thermal decomposition products include: Carbon monoxide, Carbon dioxide, and hydrogen fluorides.
SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes: Inhalation, Skin Contact, Eye Contact

Acute toxicity
- Oral: LD50 >5000 mg/kg-bw
- Dermal: LD50 >5000 mg/kg-bw
- Inhalation: LC50 >24684 ppm (4-hour) (rat)

Irritation/Corrosivity
- Slight irritant to rabbit eyes. Slight irritant to rabbit skin.

Sensitization
- It is not a skin sensitiser in animal tests.

Repeated dose toxicity
- Not to be expected (By analogy with similar materials)

Carcinogenicity
- No data.

<table>
<thead>
<tr>
<th>NTP</th>
<th>IARC</th>
<th>ACGIH</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
</tr>
</tbody>
</table>

Mutagenicity (By analogy with similar materials)
- Not to be expected (By analogy with similar materials)

Reproductive toxicity
- No data. Similar substances have produced reproductive and/or developmental effects in laboratory animals or have been implicated in higher than normal incidences of problem pregnancies among persons exposed to anesthetic gases of this type. Avoid exposure during pregnancy.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Short term
- EC50 (48 hour) >125.7 mg/L (Daphnia magna)
- EC50 (72 hour) >129.8 mg/L (Pseudokirchneriella subcapita)

Long Term
- Not to be expected.

Persistence and degradability
- Not readily biodegradable. Readily volatilizes from water.

Bioaccumulative potential
- The substance has low potential for bioaccumulation.

Mobility in soil
- Not available.

Results of PBT and vPvB assessment
- Not classified as PBT or vPvB.

Other adverse effects
- None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods
- Disposal should be in accordance with local, state or national legislation. Consult an accredited waste disposal contractor or the local authority for advice.

SECTION 14: TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th>Land transport (U.S. DOT)</th>
<th>Sea transport (IMDG)</th>
<th>Air transport (ICAO/IATA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>Proper Shipping Name</td>
<td>UN 3334</td>
</tr>
<tr>
<td></td>
<td>Not classified as dangerous for transport.</td>
<td>Aviation regulated liquid, n.o.s. (Sevoflurane Related Compound B)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>Packing group</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>Special precautions for user</td>
<td></td>
<td>Subject to quantity restrictions/limitations</td>
</tr>
</tbody>
</table>
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture:

TSCA (Toxic Substance Control Act):
- Inventory Status: All components listed and active.
- Subject of a TSCA Section 5(a)(2) Significant New Use Rule (SNUR): 49 CFR 721.11342. Process and use only as intended by the manufacturer.
- Subject to TSCA recordkeeping requirements under 40 CFR 721.125(a) thru (c) and (i).
- Subject to TSCA Section 12(b) Export Notification: 40 CFR 707.65(2)(ii) - first export to a country.

Designated Hazardous Substances and Reportable Quantities (40 CFR 302.4):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No.</th>
<th>Typical %wt.</th>
<th>RQ (Pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

SARA 311/312 - Hazard Categories: See SECTION 2 - HAZARDS IDENTIFICATION

SARA 313 - Toxic Chemicals (40 CFR 372):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No.</th>
<th>Typical %wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

SARA 302 - Extremely Hazardous Substances(40 CFR 355):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No.</th>
<th>Typical %wt.</th>
<th>TPQ (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

California Proposition 65 List:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No.</th>
<th>Type of Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: 1 & 3

Date of preparation: January 8, 2020

Additional Information: None

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