

SECTION 1: Identification

1.1. Identification

| | |
|-------------------------------|---|
| Product form | : Substance |
| Substance name | : 1,1,1,2,3,3-Hexafluoropropane |
| CAS-No. | : 431-63-0 |
| Product code | : SG-1001-04806 |
| Formula | : C3H2F6 |
| Other means of identification | : Propane, 1,1,1,2,3,3-hexafluoro- HFC 236ea R236ea |

1.2. Recommended use and restrictions on use

| | |
|------------------------------|---|
| Use of the substance/mixture | : Laboratory chemicals Manufacture of substances |
|------------------------------|---|

1.3. Supplier

Air Liquide USA LLC and its affiliates
9811 Katy Freeway, Suite 100
Houston, TX 77024 - USA
T 1-800-819-1704
www.us.airliquide.com

1.4. Emergency telephone number

| | |
|------------------|----------------------------|
| Emergency number | : Chemtrec: 1-800-424-9300 |
|------------------|----------------------------|

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

| | | |
|--|------|--|
| Gases under pressure | H280 | Contains gas under pressure; may explode if heated |
| Liquefied gas | | |
| Skin corrosion/irritation | H315 | Causes skin irritation |
| Category 2 | | |
| Serious eye damage/eye irritation Category 2A | H319 | Causes serious eye irritation |
| Specific target organ toxicity (single exposure) | H336 | May cause drowsiness or dizziness |
| Category 3 | | |
| Specific target organ toxicity (single exposure) | H335 | May cause respiratory irritation |
| Category 3 | | |
| Specific target organ toxicity (single exposure) | H371 | May cause damage to organs (heart) |
| Category 2 | | |

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS-US labeling

Hazard pictograms (GHS-US)



| | |
|----------------------------|--|
| Signal word (GHS-US) | : Warning |
| Hazard statements (GHS-US) | : H280 - Contains gas under pressure; may explode if heated H315 - Causes skin irritation H319 - Causes serious eye irritation H335 - May cause respiratory irritation H336 - May cause drowsiness or dizziness H371 - May cause damage to organs (heart) |

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Precautionary statements (GHS-US)

OSHA-H01 - May displace oxygen and cause rapid suffocation
CGA-HG01 - May cause frostbite

: P202 - Do not handle until all safety precautions have been read and understood.
P260 - Do not breathe gas.
P271 - Use only outdoors or in a well-ventilated area.
P280 - Wear eye protection, face protection, protective gloves, protective clothing.
P302 - IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area, Get immediate medical advice/attention.
P302+P352 - If on skin: Wash with plenty of 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
P308+P313 - If exposed or concerned: Get medical advice/attention.
P403 - Store in a well-ventilated place.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P362 - Take off contaminated clothing and wash before reuse.
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C/125 °F
CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG06 - Close valve after each use and when empty
CGA-PG10 - Use only with equipment rated for cylinder pressure
CGA-PG14 - Approach suspected leak area with caution
CGA-PG21 - Open valve slowly

2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name : 1,1,1,2,3,3-Hexafluoropropane
CAS-No. : 431-63-0

| Name | Product identifier | % | GHS-US classification |
|-------------------------------|--------------------|-------|--|
| 1,1,1,2,3,3-Hexafluoropropane | (CAS-No.) 431-63-0 | >= 99 | Press. Gas (Liq.), H280 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H336 STOT SE 3, H335 STOT SE 2, H371 |

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact : Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention. Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical advice/attention.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention. Rinse immediately with plenty of water for 15 minutes. If eye irritation occurs, seek medical attention.

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

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after inhalation : May displace oxygen and cause rapid suffocation. May cause drowsiness or dizziness. May cause respiratory irritation. May cause damage to organs (heart). May cause cardiac sensitization and arrhythmias.

Symptoms/effects after skin contact : May cause frostbite. Causes skin irritation.

Symptoms/effects after eye contact : Contact with the product may cause cold burns or frostbite. Causes serious eye irritation.

Symptoms/effects after ingestion : Ingestion is not considered a potential route of exposure.

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| | |
|--|---|
| Symptoms/effects upon intravenous administration | : Not known. |
| Chronic symptoms | : Adverse effects not expected from this product. |

4.3. Immediate medical attention and special treatment, if necessary

If you feel unwell, seek medical advice. If breathing is difficult, give oxygen.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

| | |
|--------------------------------|---|
| Suitable extinguishing media | : Use extinguishing media appropriate for surrounding fire. |
| Unsuitable extinguishing media | : Do not use water jet to extinguish. |

5.2. Specific hazards arising from the chemical

| | |
|------------------|---|
| Fire hazard | : The product is not flammable. |
| Explosion hazard | : Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries. |
| Reactivity | : None known. |

5.3. Special protective equipment and precautions for fire-fighters

| | |
|--------------------------------|---|
| Firefighting instructions | : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. |
| Protection during firefighting | : Standard protective clothing and equipment (e.g, Self Contained Breathing Apparatus) for fire fighters. Do not enter fire area without proper protective equipment, including respiratory protection. |

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

| | |
|------------------|--------------------------------|
| General measures | : Ensure adequate ventilation. |
|------------------|--------------------------------|

6.1.1. For non-emergency personnel

| | |
|----------------------|---|
| Protective equipment | : Wear protective equipment consistent with the site emergency plan. |
| Emergency procedures | : Evacuate personnel to a safe area. Close doors and windows of adjacent premises. Keep containers closed. Mark the danger area. Seal off low-lying areas. Keep upwind. |

6.1.2. For emergency responders

| | |
|----------------------|--|
| Protective equipment | : Standard protective clothing and equipment (e.g, Self Contained Breathing Apparatus) for fire fighters. Equip cleanup crew with proper protection. |
| Emergency procedures | : Evacuate and limit access. Ventilate area. |

6.2. Environmental precautions

Try to stop release if without risk.

6.3. Methods and material for containment and cleaning up

| | |
|-------------------------|---|
| For containment | : Try to stop release if without risk. |
| Methods for cleaning up | : Dispose of contents/container in accordance with local/regional/national/international regulations. |

6.4. Reference to other sections

See also Sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

| | |
|-----------------------------------|---|
| Additional hazards when processed | : Pressurized container: Do not pierce or burn, even after use. Use only with equipment rated for cylinder pressure. Close valve after each use and when empty. |
| Precautions for safe handling | : Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. |
| Hygiene measures | : Do not eat, drink or smoke when using this product. |

7.2. Conditions for safe storage, including any incompatibilities

| | |
|-----------------------|---|
| Technical measures | : Comply with applicable regulations. |
| Storage conditions | : Do not expose to temperatures exceeding 52 °C/ 125 °F. Keep container closed when not in use. Protect cylinders from physical damage; do not drag, roll, slide or drop. Store in well ventilated area. Store locked up. |
| Incompatible products | : None known. |

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Incompatible materials : Strong oxidizing agents. Alkali metals.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

1,1,1,2,3,3-Hexafluoropropane (431-63-0)

Not applicable

8.2. Appropriate engineering controls

Appropriate engineering controls : Ensure exposure is below occupational exposure limits (where available). Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Oxygen detectors should be used when asphyxiating gases may be released. Consider the use of a work permit system e.g. for maintenance activities.

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

8.3. Individual protection measures/Personal protective equipment

Hand protection:

Wear working gloves when handling gas containers. 29 CFR 1910.138: Hand protection

Eye protection:

Wear safety glasses with side shields. 29 CFR 1910.133: Eye and Face Protection

Skin and body protection:

Wear suitable protective clothing, e.g. lab coats, coveralls or flame resistant clothing.

Respiratory protection:

None necessary during normal and routine operations. See Sections 5 & 6.

Thermal hazard protection:

None necessary during normal and routine operations.

Other information:

Wear safety shoes while handling containers. 29 CFR 1910.136: Foot Protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Clear, colorless gas.

Color : Colorless

Odor : Odorless

Odor threshold : No data available

pH : No data available

Melting point : -146 °C

Freezing point : -146 °C

Boiling point : 6 °C

Critical temperature : 141 °C

Critical pressure : 35.3 bar (511.98 PSIG)

Flash point : Not applicable - not flammable

Relative evaporation rate (butyl acetate=1) : No data available

Flammability (solid, gas) : See Section 2.1 and 2.2

Vapor pressure : 0.79 bar at 21.1 °C (11.5 PSIG)

Relative vapor density at 20 °C : No data available

Relative density : No data available

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| | |
|----------------------------|---------------------------------------|
| Specific gravity / density | : 1.39 g/ml at 25 C |
| Molecular mass | : 152.04 g/mol |
| Relative gas density | : Heavier than air |
| Solubility | : Water: 1.93 g/l |
| Log Pow | : No data available |
| Auto-ignition temperature | : No data available |
| Decomposition temperature | : No data available |
| Viscosity, kinematic | : No data available |
| Viscosity, dynamic | : No data available |
| Explosion limits | : Not applicable - not flammable |
| Explosive properties | : Not applicable (non-flammable gas). |
| Oxidizing properties | : None. |

9.2. Other information

| | |
|------------------------|--|
| Additional information | : Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level |
|------------------------|--|

SECTION 10: Stability and reactivity

10.1. Reactivity

None known.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Strong oxidizing agents. Alkali metals.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Thermal decomposition generates : Carbon oxides. Hydrogen fluoride. Carbonyl fluoride.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

| | |
|----------------|------------------|
| Acute toxicity | : Not classified |
|----------------|------------------|

| 1,1,1,2,3,3-Hexafluoropropane (431-63-0) | |
|--|--------------|
| LC50 inhalation rat (ppm) | 85000 ppm/4h |

| | |
|--|--|
| Skin corrosion/irritation | : Causes skin irritation. |
| Serious eye damage/irritation | : Causes serious eye irritation. |
| Respiratory or skin sensitization | : Not classified |
| Germ cell mutagenicity | : Not classified |
| Carcinogenicity | : Not classified |
| Reproductive toxicity | : Not classified |
| Specific target organ toxicity – single exposure | : May cause drowsiness or dizziness. May cause respiratory irritation. May cause damage to organs (heart). |
| Specific target organ toxicity – repeated exposure | : Not classified |
| Aspiration hazard | : Not classified |
| Symptoms/effects after inhalation | : May displace oxygen and cause rapid suffocation. May cause drowsiness or dizziness. May cause respiratory irritation. May cause damage to organs (heart). May cause cardiac sensitization and arrhythmias. |

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| | |
|--|--|
| Symptoms/effects after skin contact | : May cause frostbite. Causes skin irritation. |
| Symptoms/effects after eye contact | : Contact with the product may cause cold burns or frostbite. Causes serious eye irritation. |
| Symptoms/effects after ingestion | : Ingestion is not considered a potential route of exposure. |
| Symptoms/effects upon intravenous administration | : Not known. |
| Chronic symptoms | : Adverse effects not expected from this product. |

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

| | |
|----------------------------------|---------------------------------------|
| Effect on ozone layer | : No known effects from this product. |
| Global warming potential [CO2=1] | : 1335 |
| Effect on global warming | : No known effects from this product. |
| GWPmix comment | : No known effects from this product. |

SECTION 13: Disposal considerations

13.1. Disposal methods

| | |
|--|--|
| Waste treatment methods | : Contact supplier if guidance is required. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded. |
| Product/Packaging disposal recommendations | : Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at www.cganet.com for more guidance on suitable disposal methods. |

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

| | |
|--------------------------------|---|
| Transport document description | : UN3163 Liquefied gas, n.o.s. (1,1,1,2,3,3-Hexafluoropropane), 2.2 |
| UN-No.(DOT) | : UN3163 |
| Proper Shipping Name (DOT) | : Liquefied gas, n.o.s. |
| Class (DOT) | : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115 |
| Hazard labels (DOT) | : 2.2 - Non-flammable gas |



| | |
|--|--|
| DOT Packaging Non Bulk (49 CFR 173.xxx) | : 304 |
| DOT Packaging Bulk (49 CFR 173.xxx) | : 314;315 |
| DOT Symbols | : G - Identifies PSN requiring a technical name |
| DOT Special Provisions (49 CFR 172.102) | : T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter. |
| DOT Packaging Exceptions (49 CFR 173.xxx) | : 306 |
| DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) | : 75 kg |

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DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 150 kg

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.

Other information : No supplementary information available.

Transportation of Dangerous Goods

Transport document description : UN3163 LIQUEFIED GAS, N.O.S., 2.2

UN-No. (TDG) : UN3163

Proper Shipping Name : LIQUEFIED GAS, N.O.S.

TDG Primary Hazard Classes : 2.2 - Class 2.2 - Non-Flammable, Non-Toxic Gas.

Transport by sea

Transport document description (IMDG) : UN 3163 LIQUEFIED GAS, N.O.S., 2

UN-No. (IMDG) : 3163

Proper Shipping Name (IMDG) : LIQUEFIED GAS, N.O.S.

Class (IMDG) : 2 - Gases

Limited quantities (IMDG) : 120 ml

Air transport

Transport document description (IATA) : UN 3163 LIQUEFIED GAS, N.O.S., 2.2

UN-No. (IATA) : 3163

Proper Shipping Name (IATA) : LIQUEFIED GAS, N.O.S.

Class (IATA) : 2

SECTION 15: Regulatory information

15.1. US Federal regulations

No additional information available

15.2. International regulations

CANADA

No additional information available

EU-Regulations

No additional information available

National regulations

No additional information available

15.3. US State regulations

No additional information available

SECTION 16: Other information

Other information : This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product.

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Full text of H-phrases:

| | |
|------|--|
| H280 | Contains gas under pressure; may explode if heated |
| H315 | Causes skin irritation |
| H319 | Causes serious eye irritation |
| H335 | May cause respiratory irritation |
| H336 | May cause drowsiness or dizziness |
| H371 | May cause damage to organs |

SDS US (GHS HazCom 2012)

This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide USA LLC and its affiliates' knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.