

**1. IDENTIFICATION**

**Product name** Halocarbon R-422D  
**Commercial name:**

**Synonyms** -

**CAS #** See section 3

**Product code** -

**Product use** Synthetic/Analytical Chemistry

**Manufacturer/Supplier**

**Supplier (Manufacturer):** iGas USA, Inc.  
**Address:** 8105 Anderson Road, Tampa, FL 33764  
**Contact Person (E-mail):** projects@igasusa.com  
**Telephone:** (813) 443-0757  
**Fax:** (813) 886-7900

**Emergency telephone Number:** Chemtrec: 1-800-424-9300

**2. HAZARD(S) IDENTIFICATION**

**OSHA/HCS Status** This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**GHS Classification**


**Physical hazards** Gases under pressure. Compressed gas. Liquefied gas

**Health Hazards** Not classified

**Environmental Hazards** Not classified

**Hazard Statements** Contains gas under pressure; may explode if heated. May cause frostbite. May displace oxygen and cause rapid suffocation.

**GHS Label Elements**

**Hazard Pictograms** 

**Signal word** Warning

**Precautionary Statement**

**General** Read and follow all Safety Data Sheets (SDS's) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back-flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position.

<b>Prevention</b>	Not applicable
<b>Response</b>	Not applicable
<b>Storage</b>	Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.
<b>Disposal</b>	Not applicable.
<b>Hazards Not Otherwise Classified</b>	Liquid can cause burns similar to frostbite.

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

Components	CAS#	Percent
Pentafluoroethane	354-33-6	65.1%
1,1,1,2 - tetrafluoroethane	811-97-2	31.5%
Isobutane	75-28-5	3.4%

**4. FIRST-AID MEASURES**

**First aid procedures**

**Eye contact**

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

**Skin contact**

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected area. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Inhalation**

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband

**Ingestion**

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if adverse health effects persist or are severe. Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs, get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. As this product rapidly becomes a gas when released, refer to the inhalation section.

**Notes to physician**

Treat symptoms.

**Most Important Symptoms/Effects, Acute and Delayed**

**Potential Acute Health Effect:**

<b>Eye Contact</b>	Liquid can cause burns similar to frostbite.
<b>Inhalation</b>	No known significant effects or critical hazards
<b>Skin Contact</b>	Derma contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
<b>Frostbite</b>	Try to warm up the frozen tissues and seek medical attention.
<b>Ingestion</b>	Ingestion of liquid can cause burns similar to frostbite.

**Potential Acute Health Effects**

<b>Eye Contact</b>	Adverse symptoms may include the following: <b>Frostbite</b>
<b>Inhalation</b>	No specific data.
<b>Skin Contact</b>	Adverse symptoms may include the following: <b>Frostbite</b>
<b>Ingestion</b>	Adverse symptoms may include the following: <b>Frostbite</b>

**Indication of Immediate Medical Attention and Special Treatment Needed, If Necessary:**

<b>Notes to Physician</b>	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
<b>Specific Treatments</b>	No specific treatment
<b>Protection of First-Aid Responders</b>	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

**5. FIRE FIGHTING MEASURES**

<b>Flammable properties</b>	Flammable.
<b>Extinguishing media</b>	
<b>Suitable extinguishing media:</b>	Use an extinguishing agent suitable for the surrounding fire.
<b>Unsuitable extinguishing media:</b>	None known.
<b>Specific hazards arising from the chemical:</b>	Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.
<b>Hazardous thermal decomposition products:</b>	Decomposition products may include the following materials: carbon dioxide, carbon monoxide, halogenated compounds
<b>Special protective actions for fire fighters:</b>	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
<b>Firefighting equipment/instructions</b>	Firefighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.

**6. ACCIDENTAL RELEASE MEASURES****Personal precautions, protective equipment and emergency procedures****For Non-Emergency Personnel**

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protection equipment.

**For Emergency Responders**

If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For Non-Emergency Personnel".

**Environmental Precautions**

Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

**Methods and Material for Containment and Cleaning Up****Small Spills**

Immediately contact emergency personnel. Stop leak if without risk.

**Large Spills**

Immediately contact emergency personnel. Stop leak if without risk.

Note: See Section 1 for emergency contact information and Section 13 for waste disposal.

**7. HANDLING AND STORAGE****Handling**

Avoid inhalation of high concentrations of vapours. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Atmospheric concentrations well below the occupational exposure limit can be achieved by good occupational hygiene practice. The vapor is heavier than air, high concentrations may be produced at low levels where general ventilation is poor, in such cases provide adequate ventilation or wear suitable respiratory protective equipment with positive air supply. Avoid contact with naked flames and hot surfaces as corrosive and very toxic decomposition products can be formed. Avoid contact between the liquid and skin and eyes. For correct refrigerant composition, systems should be charged using the liquid phase and not the vapor phase.

**Storage**

Keep in a well-ventilated place. Keep in a cool place away from fire risk, direct sunlight and all sources of heat such as electric and steam radiators. Avoid storing near to the intake of air conditioning units, boiler units and open drains. Cylinders and Drums:  
Keep container dry. Storage temperature: < 45°C.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION****Control parameters:****OCCUPATIONAL EXPOSURE LIMITS (OEL) INGREDIENT DATA:**

None

**Appropriate Engineering Controls:** Good general ventilation should be sufficient to control worker exposure to airborne contaminants.**Environmental Exposure Controls:** Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.**Individual Protection Measures****Hygiene Measures**

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye / Face Protection**

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

**Hand Protection**

Chemical-resistant, impervious glove complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

**Body Protection**

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory Protection**

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**Other Skin Protection**

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risk involved and should be approved by a specialist before handling this product.

**9. PHYSICAL AND CHEMICAL PROPERTIES****Appearance**

<b>Physical state</b>	Gas [Liquified gas]
<b>Color</b>	Not available
<b>Odor</b>	Not available
<b>Odor threshold</b>	Not available
<b>pH</b>	Not available
<b>Vapor Pressure</b>	Not available
<b>Vapor Density</b>	Highest known value: 4.2 (Air = 1) (Pentafluoroethane). Weighted Average: 3.9 (Air = 1)
<b>Melting Point/Freezing Point</b>	-103°C (-153.4°F) This is based on data for the following ingredient: Pentafluoroethane. Weighted average: -106.51°C (-159.7°F)
<b>Critical Temperature</b>	Lowest known value: 72.4°C (162.3°F) (Pentafluoroethane)
<b>Flash Point</b>	Not available
<b>Burning Time</b>	Not applicable
<b>Burning Rate</b>	Not applicable
<b>Evaporation rate</b>	Not available
<b>Flammability (solid, gas)</b>	Not available
<b>Lower/Upper Explosion limits</b>	Not available
<b>Relative density</b>	Not applicable
<b>Solubility</b>	Not available
<b>Solubility in Water</b>	Not available
<b>Partition Coefficient</b>	n-octanol/water: Not available
<b>Auto-Ignition Temperature</b>	Not available
<b>Decomposition temperature</b>	Not available
<b>SADT</b>	Not available
<b>Gas Density (lb/ft<sup>3</sup>)</b>	Weighted average: 0.3
<b>Viscosity</b>	Not available

**10. STABILITY AND REACTIVITY**

<b>Reactivity</b>	No specific test data related to reactivity available for this product or its ingredients.
<b>Chemical stability</b>	This product is stable.
<b>Possibility of Hazardous Reactions</b>	Under normal conditions of storage and use, hazardous reactions will not occur.
<b>Conditions to Avoid</b>	No specific data.
<b>Incompatible with Various Substances</b>	Highly reactive or incompatible with the following materials: <b>alkalis</b>
<b>Hazardous Decomposition Products</b>	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
<b>Hazardous Polymerization</b>	Under normal conditions of storage and use, hazardous polymerization will not occur.

**11. TOXICOLOGICAL INFORMATION**

**Information on toxicological effects:**

<b>Acute Toxicity:</b>	Not available
<b>Irritation/Corrosion:</b>	Not available
<b>Sensitization</b>	Not available
<b>Mutagenicity</b>	Not available
<b>Carcinogenicity</b>	Not available
<b>Reproductive Toxicity</b>	Not available
<b>Teratogenicity</b>	Not available

**Specific Target Organ Toxicity**

<b>Single Exposure</b>	Not available
<b>Repeated Exposure</b>	Not available

**Aspiration Hazard** Not available

**Information on the likely routes of exposure** Not available

**Potential Acute Health Effects**

<b>Eye Contact</b>	Liquid can cause burns similar to frostbite.
<b>Inhalation</b>	No known significant effects or critical hazards.
<b>Skin Contact</b>	Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
<b>Ingestion</b>	Ingestion of liquid can cause burns similar to frostbite.

**Delayed and immediate effects and also chronic effects from short- and long-term exposure**

**Short Term Exposure**

Potential immediate effects	Not available
Potential delayed effects	Not available

**Long Term Exposure**

Potential immediate effects	Not available
Potential delayed effects	Not available

**Potential chronic health effects** Not available

<b>General</b>	No known significant effects or critical hazards.
<b>Carcinogenicity</b>	No known significant effects or critical hazards.
<b>Mutagenicity</b>	No known significant effects or critical hazards.
<b>Teratogenicity</b>	No known significant effects or critical hazards.
<b>Developmental effects</b>	No known significant effects or critical hazards.
<b>Fertility effects</b>	No known significant effects or critical hazards.

**Numerical measures of toxicity**

**Acute toxicity estimates** Not available.

**12. ECOLOGICAL INFORMATION**

**Toxicity** Not available.  
**Persistence and degradability** Not available.  
**Bioaccumulative potential** Not available.

**Mobility in soil**

**Soil/Water partition coefficient (Koc)** Not available.  
**Other adverse effects** No known significant effects or critical hazards.

**13. DISPOSAL CONSIDERATIONS**

**Disposal methods** The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional and local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty iGas USA-owned pressure vessels should be returned to iGas USA, 8105 Anderson Road, Tampa, FL 33634. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not Puncture or incinerate container.

**14. TRANSPORT INFORMATION**

	<b>DOT</b>	<b>TDG</b>	<b>MEXICO</b>	<b>IMDG</b>	<b>IATA</b>
<b>UN Number</b>	UN3163	UN3163	UN3163	UN3163	UN3163
<b>UN Proper Shipping Name</b>	LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, Iso-butane)	LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, Iso-butane)	LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, Iso-butane)	LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, Iso-butane)	LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, Iso-butane)
<b>Transport Hazard Class(s)</b>	2.2	2.2	2.2	2.2	2.2
<b>Packing Group</b>	-	-	-	-	-
<b>Environment</b>	No.	No.	No.	No.	No.
<b>Additional Information</b>	-	<b>Explosive Limit and Limited Quantity Index</b> 0.125 <b>Passenger Carrying Road or Rail Index</b> 75	-	-	-



“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

**Special precautions for user**

Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not available.

**15. REGULATORY INFORMATION**

**U.S. Federal Regulations**

**TSCA 8(a) CDR Exempt/Partial exemption:** Not determined

**United States Inventory (TSCA 8b):** All components are listed or exempted.

**Clean Air Act (CAA) 112 regulated flammable substances:** Isobutane

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPS)**

Not Listed

**Clean Air Act Section 602 Class I Substances**

Not Listed

**Clean Air Act Section 602 Class II Substances**

Not Listed

**DEA List I of Chemicals (Precursor Chemicals)**

Not Listed

**DEA List II Chemicals (Essential Chemicals)**

Not Listed

**SARA 304 RQ**

Not applicable

**SARA 311/312 Classification**

Sudden release of pressure

**Composition/Information on Ingredients**

No products were found

**State Regulations**

**Massachusetts**

The following components are listed: ISOBUTANE

**New York**

None of the components are listed.

**New Jersey**

The following components are listed: Isobutane; PROPANE, 2-METHYL-

**Pennsylvania**

The following components are listed: PROPANE, 2-METHYL-

**Canada Inventory**

All components are listed or exempted.

**International Regulations**

**International Lists**

**Australia Inventory (AICS):** All components are listed or exempted.

**China Inventory (IECSC):** All components are listed or exempted.

**Japan Inventory:** All components are listed or exempted.

**Korea Inventory:** All components are listed or exempted.

**Malaysia Inventory (EHS Register):** Not determined.

**New Zealand Inventory of Chemicals (NZIoC):** All components are listed or exempted.

**Philippines Inventory (PICCS):** All components are listed or exempted.

**Taiwan Inventory (CSNN):** Not determined.

**Chemical Weapons**

**Convention List Schedule I Chemicals** Not listed.

**Chemical Weapons**

**Convention List Schedule II Chemicals** Not Listed.

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**Chemical Weapons****Convention List Schedule III Chemicals** Not Listed.**Canada****WHMIS (Canada)****Class A:** Compressed gas.**CEPA Toxic Substances:** The following components are listed: Volatile organic compounds; Volatile organic compounds.**Canadian ARET:** None of the components are listed.**Canadian NPRI:** The following components are listed: Volatile organic compounds; Volatile organic compounds; Butane (all isomers).**Alberta Designated Substances:** None of the components are listed.**Ontario Designated Substances:** None of the components are listed.**Quebec Designated Substances:** None of the components are listed.**Class A:** Compressed Gas.**Canada Label Requirements****California Proposition 65**

This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

**16. OTHER INFORMATION****HMIS® ratings**

Health: 1

Flammability: 1

Physical hazard: 1

**NFPA ratings**

Health: 2

Flammability: 1

Instability: 0

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**17. DISCLAIMER**

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**REVISED DATE:** April 29, 2019**REFERENCE:** Revised for GHS compliance