

SAFETY DATA SHEET

R-600a / Isobutano

According to Regulation (EU) n ° 1907/2006 (Reach), Annex II

1. Identification of the substance/mixture and of the company/undertaking

Trade name: R600a
Substance Name: Isobutane
Reach Reg. no: 75-28-5

CAS No.: 200-857-2
EC No.: R600q

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

Identified Uses: Used as refrigerants.
Uses advised against: No uses advised against.

Manufacturer & Importer:
GEFRIEREN, S.A. de C.V.
Boulevard Benito Juárez 10, San Mateo Cuauhtepac, 54948 Tultitlán de Mariano Escobedo, Méx.
E – mail: ventas@gefrieren-gas.com
Tlf.: (55) 4550 43 03
www.gefrieren-gas.com

2. Hazards identification:

This product does not contain oxygen and may cause asphyxia if released in a confined area. Simple hydrocarbons can cause irritation and central nervous system depression at high concentrations. Extremely flammable.

EYE EFFECTS:
None anticipated as product is a gas at room temperature.

SKIN EFFECTS:
None anticipated as product is a gas at room temperature.

INGESTION EFFECTS:
Ingestion is unlikely.

INHALATION EFFECTS:
Product is relatively nontoxic. Simple hydrocarbons can irritate the eyes, mucous membranes and respiratory system at high concentrations. Inhalation of high concentrations may cause dizziness, disorientation, incoordination, narcosis, or nausea or narcotic.

This product may displace oxygen if released in a confined space. Maintain oxygen levels above 19.5% at sea level to prevent asphyxiation. Effects of oxygen deficiency resulting from simple asphyxiants may include: rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgement, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma, and death.

Oxygen deficiency during pregnancy has produced development abnormalities in humans and experimental animals.

Label Elements:

Substance name: Isobutane.

Hazard pictogram(s):



Signal word: Warning.

Hazard statements: Extremely flammable gas.

Contains gas under pressure, may explode if heated.

Precautionary statements:

Prevention: Keep away from heat/sparks/open flames/hot surfaces. -No smoking.

Response: Leaking gas fire: Do not extinguish unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

Storage: Protect from sunlight. Store in a well-ventilated place.

3. Composition/Information on Ingredients.

Substance Information:

Substance Name	Synonyms	Cas No.	No EINECS	Molecular Formula	% (w/w)
Isobutane	R600a	75-28-5	200-857-2	C4H10	≥99.60

4. Hazards Identification

This product does not contain oxygen and may cause asphyxia if released in a confined area. Simple hydrocarbons can cause irritation and central nervous system depression at high concentrations.
Extremely flammable.

Eye effects:

None anticipated as product is a gas at room temperature.

Skin effects:

None anticipated as product is a gas at room temperature.

Ingestion effects:

Ingestion is unlikely.

Inhalation effects:

Product is relatively nontoxic.

Simple hydrocarbons can irritate the eyes, mucous membranes and respiratory system at high concentrations. Inhalation of high concentrations may cause dizziness, disorientation, incoordination, narcosis, or nausea or narcotic.

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Oxygen deficiency during pregnancy has produced development abnormalities in humans and experimental animals.

Health effects:

Contacts with liquid may cause frost bite and injury to the cornea.

Inhalation of high concentration of vapour is harmful and may cause unconsciousness or death.

- Eye contact: Could cause serious cold burns. (Liquid)
- Skin contact: Contact with liquid may cause cold burns. (Liquid)

5. First Aid Measures

Eyes:

Never introduce oil or ointment into the eyes without medical advice! If pain is present, refer the victim to an ophthalmologist for further treatment and follow-up.

Skin:

Remove contaminated clothing and flush affected area with cold water and soap. If irritation persists, seek medical attention.

Ingestion:

Not normally requires. Seek immediate medical attention.

Inhalation:

Prompt medical attention is mandatory in all cases of overexposure to products. Rescue personnel should be equipped with self-contained breathing apparatus. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted (artificial) respiration and supplemental oxygen. Further treatment should be symptomatic and supportive.

Indication of the immediate medical attention and special treatment needed

Persons with pre-existing skin, eye, or respiratory disease may be at increased risk from the irritant or allergic properties of this material. Attending physician should treat exposed patients symptomatically

6. Fire-fighting Measures

- **Extinguishing media**

Suitable extinguishing media:

Water, Carbon dioxide, dry chemical.

- **Special hazards arising from the substance or mixture**

Isobutane is heavier than air and may travel a considerable distance to an ignition source. Isobutane is a flammable gas, keep away from open flame and other sources of ignition. Do not allow smoking in storage areas or when handling.

- **Advice for fire-fighters**

If possible, stop the flow of gas with a remote valve. Use water spray to cool exposed containers. If fire is extinguished and flow of gas continues, increase ventilation to prevent a buildup of a flammable/explosive atmosphere. Extinguish sources of ignition. Be caution of a Boiling liquid Evaporating Vapor Explosion, BLEVE, if flame is impinging on surrounding containers. Direct a 500 GPM water stream onto containers above the liquid level with remote monitors. Limit the number of personnel in proximity to the fire. Evacuate surrounding areas to at least 3000 feet in all directions.

7. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- Shut off all sources of ignition.
- Provide adequate ventilation.
- Avoid breathing vapors, mist or gas.
- Ensure adequate ventilation.
- Remove all sources of ignition.
- Evacuate personnel to safe areas.
- Beware of vapours accumulating to form explosive concentrations.
- Vapours can accumulate in low areas

8. Handling and Storage

Precautions for safe handling

Earth bond and ground all lines and equipment associated with the product system. Electrical equipment should be non-sparking and explosion proof. 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 pressure regulator when connecting to lower pressure (250sig) 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 away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 130°F(54°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 from being stored for excessive periods of time.

Post “No Smoking” signs in storage or use areas.

For additional recommendations consult Compressed Gas Association Pamphlet P-1.

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.

9. Exposure controls/personal protection

Appropriate engineering controls:

Use local exhaust to prevent gas from accumulating. Use general ventilation to prevent buildup of flammable concentrations. Use a hood with ventilation when handling small quantities. If product is handled routinely where the potential for leaks exists, all electrical equipment must be rated for use in potentially flammable atmospheres. Consult the National Electrical Code for details.

Personal protective equipment:

- **Eye and face protection:**
Sufficient eye protection should be worn.
When handling compressed gas, at least glasses with side protection should be worn.
When handling liquid gas, chemical safety goggles must be used as well as a protective shield.
- **Skin protection:**
Body protection: Use protective boots while handling gas cylinders.
Wear flameproof, antistatic protective clothing.
Hand protection: Wear leather gloves to prevent frostbite injuries from rapidly expanding gas when handling pressurized gas bottles.
- **Respiratory protection:**
In an emergency (e.g.: unintentional release of the substance) respiratory protection must be worn. Consider the maximum period for wear. Wear self-contained breathing apparatus. Do not use filter respirator.

10. Physical and chemical properties

Information on basic physical and chemical properties.

Appearance:	Compressed liquefied gas.
Color:	Colorless, no turbid.
Odor:	No strange stench.
Molecular Weight	58.12
Boiling Point:	-11.7° C
Critical Density:	0.221 g/cm ³
Specific heat of Liquid:	2.38[KJ/(kg·°C)] at 25°C
Flash Point:	< -83°C (closed cup)
Critical Temperature:	134.71°C
Critical Pressure:	3.64 Mpa
Flammability:	LOWER EXPLOSIVE LIMIT (%):1.8 UPPER EXPLOSIVE LIMIT (%):8.4
Decomposition temperature:	No data available.
Explosive Properties:	No data available.
Oxidizing properties:	Non oxidizer

11. Stability and Reactivity

- Stability: Stable. Avoid high temperature. Product will start to decompose at 815°F (435°C)
- Incompatible materials: Oxidizers.
- Hazardous decomposition product: Carbon Dioxide and Carbon monoxide if sufficient oxygen is present.

12. Toxicological information

Oxygen deficiency during pregnancy has produce developmental abnormalities in humans and experimental animals. No chronic effects data given in the Registry of Toxic Effects of Chemical Substances (RTECS) or Sax Dangerous Priorities of Industrial Materials 7th ed.

Additional information:

No data available

13. Disposal Considerations

Do no attempt to dispose of waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS CAPS SECURED AND VALVE PROTECTION CAP IN PLACE TO Advanced Gas Technologies for proper handling

14. Transport Information

LAND TRANSPORT (ADR/RID/GGVSE)	
UN-No.:	1969
Official transport designation:	Isobutane (REFRIGERANT GAS R 600a)
Class:	2.1
Packing group:	Disposable cylinders, ton cylinder, isotank etc.
Hazard label:	2.1

SEA TRANSPORT (IMDG-Code/GGVSee)	
Proper Shipping Name	Isobutane (REFRIGERANT GAS R 600a)
Class:	2.1
UN-No.:	1969
Packing group:	Disposable cylinders, ton cylinder, isotank etc.
EMS-No.:	F-D, S-U
Marine pollutant:	No

Additional Information: No data available.

15. Regulatory Information

SARA TITLE III NOTIFICATIONS AND INFORMATION

SARA TITLE III-HAZARD CLASSES: Acute health hazard

Fire Hazard

Sudden Release of Pressure Hazard

16. Other Information

NFPA HAZARD RATING

-HEALTH 1 Slight Hazard
-FIRE 4 Severe Hazard
-REACTIVITY 0 No Hazard

MSDS IDENTIFICATION CODE/NUMBER: 1A

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