



# Isobutane (R-600a)

Revision 2: October 2019

Date 30.10.2019

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product Identifier

Mixture identification:

Trade name: **Isobutane (R-600a)**

Product type and use: Refrigerant gas

### 1.2. Relevant identified uses of the substance/mixture and uses advised against

Recommended use:

Refrigerant

### 1.3. Details of the supplier of the safety data sheet

Company:

GAS-SERVEI, SA.

C/ Motores, 151-155 nave nº 9

08038 Barcelona

ESPAÑA

Tel: +34 (93) 2231377

Fax: +34 (93) 2231479

[www.gas-servei.com](http://www.gas-servei.com)

**Competent person responsible for the safety data sheet:**

gas-servei@gas-servei.com

### 1.4. Emergency telephone number

Gas- servei: + 34 619373605

National Institute of Toxicology (Spain) : + 34 (91) 5620420

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

E C regulation No. 1272/2008 (CLP):



2.2/1 2.2/1 Flammable Gas 1 H220 : Extremely flammable gas



Gas under pressure, liquefied gas H280: Contains gas under pressure; may explode if heated.

### 2.2. Label elements

Symbols:



Danger



Warning

Hazard statements:

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

Precautionary statements:

P210 Keep away from heat, sparks, open flames, hot surfaces. No smoking.

P377 Leaking gas fire: do not extinguish, unless leak can be stopped safely.

P381 Eliminate all ignition sources if safe to do so.

P410+P403 Protect from sunlight. Store in a well-ventilated place.

Special Provisions:

None

### 2.3. Other hazards



vPvB Substances: None - PBT Substances: None

#### Other risks

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.  
 Rapid evaporation of the liquid may cause frostbite.  
 Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.  
 May cause cardiac arrhythmia.  
 The product or equipment contains fluorinated greenhouse gases covered by the Kyoto Protocol

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Components	Concentration (% w/w)	CAS No.	EC No.	REACH No.	Classification
					Regulation CE N°1272/2008
Isobutane (R-600a)	100	75-28-5	200-857-2	01-2119485395-27-XXXX	 2.2/1 Flam. Gas 1 H220  2.5 Press. Gas H280

### 3.2. Mixtures

N.A.

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

For exhibitions to the liquid, the recommendation of the first aids given for contact with the skin(leather), I contact the eyes and ingestion, it(he,she) is equally applicable. See also section 11.



#### In case of skin contact:

Thaw affected areas with water. Remove contaminated clothing. Caution: clothing may adhere to the skin in the case of freeze burns. After contact with skin, wash immediately with plenty of warm water. If irritation or blistering occur obtain medical attention.

#### In case of eyes contact:

Wash immediately and thoroughly with running water, keeping eyelids raised, for at least 10 minutes. Following this, protect the eyes with sterile gauze or a clean, dry, handkerchief.  
 Obtain a medical examination.

#### In case of Ingestion:

Unlikely route of exposure. Do not induce vomiting. Provided the patient is conscious, wash out mouth with water and give 200-300 ml (half a pint) of water to drink. Obtain immediate medical attention. Further Medical Treatment

#### In case of Inhalation:

Move to fresh air. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. In case of shortness of breath, give oxygen.  
 Remove casualty to fresh air and keep warm and at rest.

### 4.2. Most important symptoms and effects, both acute and delayed

Inhalation of high concentration may cause central nervous system depression resulting in dizziness, weakness, nausea, headache and possibly unconsciousness., Anaesthetic effects, Light-headedness, Confusion, Incoordination. Drowsiness, irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness

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### 4.3. Indication of any immediate medical attention and special treatment needed

Treatment:

Symptomatic treatment and therapy of support, as turn out to be indicated.

Contact poison treatment specialist immediately if large amounts have been inhaled or ingested.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media:

In case of fire, use water spray, foam or dry powder.

Unsuitable extinguishing media: Carbon dioxide. Do not use water jet.

### 5.2. Special hazards arising from the substance or mixture

Vapours may form flammable mixture with air. Pressure build-up. Fire or intense heat may cause violent rupture of cylinders

Hazardous combustion products: Incomplete combustion may form carbon monoxide.

### 5.3. Advice for fire-fighters

Use suitable breathing apparatus . Fight fire remotely due to the risk of explosion.

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Move undamaged containers from immediate hazard area if it can be done safely.

Evacuate area.

Cool containers/tanks with water spray. Allow to burn until flow can be stopped.

Firefighters must wear clothing and fire protection equipment.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

Ensure suitable personal protection (including respiratory protection) during removal of spillages.

Evacuate personnel to safe areas. Avoid skin contact with leaking liquid (danger of frostbite).

Ventilate the area.

See protective measures under point 7 and 8.

### 6.2. Environmental precautions

Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.

Retain contaminated washing water and dispose it.

In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

Suitable material for taking up: absorbing material, organic, sand

### 6.3. Methods and material for containment and cleaning up

Wash with plenty of water. Ventilate the area.

### 6.4. Reference to other sections

See also section 8 and 13

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Only experienced and properly instructed persons should handle liquefied gases liquids. Protect packages from physical damage; do not drag, roll, slide or drop.

Avoid contact with skin and eyes, inhalation of vapours and mists. Wash contaminated clothing before re-use.

Do not eat or drink while working. See also section 8 for recommended protective equipment.

Avoid venting to atmosphere.

Liquid refrigerant transfers between refrigerant containers and to and from systems can result in static generation.

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Ensure adequate earthing. Vapours may form explosive mixtures with air. The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Electrical equipment should be protected to the appropriate standard. No sparking tools should be used. Take measures to prevent the build up of electrostatic charge. Keep away from heat and sources of ignition. Keep away from open flames, hot surfaces and sources of ignition. Care must be taken to mitigate the risk of developing high pressures in systems caused by a temperature rise when liquid is trapped between closed valves or in cases where containers have been overfilled.

### 7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from contamination. Protect cylinders from damage. Keep away from direct sunlight. Store only in approved containers.

Keep away from:

Flammable materials

Combustible material

Instructions as regards storage premises:

Adequately ventilated premises.

#### Additional information on storage conditions:

Do not allow the storage temperature to reach 50 ° C (122 ° F).

Store in accordance with the particular national regulations.

### 7.3. Specific end use(s)

None

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Occupational Exposure Limits	CAS	VLA-ED (8 h ppm)	VLA- ED (8 h mg/m <sup>3</sup> )	VLA- EC (15m. ppm)	VLA-EC (15m. g/m <sup>3</sup> )	Note
Isobutane (R-600a)	75-28-5	1000	1900			COM

### 8.2. Exposure controls

#### Eye protection:

Safety glasses recommended when handling containers.

#### Skin and body protection:

Wear suitable protective equipment. Wear as appropriate: Flame retardant antistatic protective clothing.

Safety shoes are recommended when handling containers.

#### Protection for hands:

Sturdy work gloves are recommended for handling containers.

#### Respiratory protection:

Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere.

Air purifying respirators will not provide protection. Users of breathing apparatus must be trained.

#### Thermal Hazards:

Use gloves thermos insulating

#### Environmental exposure controls:

Ensure adequate ventilation, especially in confined areas.



**SECTION 9: Physical and chemical properties****9.1. Information on basic physical and chemical properties**

Appearance and colour:	Liquefied, colorless gas
Odour:	Sweetish. Poor warning properties at low concentrations.
Odour threshold:	No data available
pH:	No data available
Melting point / freezing point:	-159 °C
Boiling point:	-12 °C
Inflammabilité (solide, gaz):	Not applicable
Upper/lower flammability or explosive limits:	8,5% /1,8%
Flash point:	-85 °C
Evaporation rate:	No data available
Vapour pressure:	approx. 3 bar (20°C)
Vapour density:	2,01 (Air = 1)
Relative density:	0,59 (As a liquid, Water=1)
Solubility in water:	approx. 33cm <sup>3</sup> /l 20°C
Partition coefficient (n-octanol/water):	Log Pow: 2,8
Auto-ignition temperature:	460 °C
Decomposition temperature:	No data available
Explosive properties:	Vapors can form explosive mixtures with air
Oxidizing properties:	Not applicable

**9.2. Other information**

Miscibility:	Not applicable
Fat Solubility:	Not applicable
Conductivity:	Not applicable
Substance Groups relevant properties	Not applicable
Critical temperature:	134,85 °C
Critical Pressure:	37,2 bar

**SECTION 10: Stability and reactivity****10.1. Reactivity**

No specific test data related to reactivity available for this product

**10.2. Chemical stability**

Stable under normal conditions

**10.3. Possibility of hazardous reactions**

Under normal conditions of storage and use, hazardous reactions will not occur.

**10.4. Conditions to avoid**

Keep away from: Heat, flames and sparks. Do not spray on a naked flame or any incandescent material. Pressurized container: Do not pierce or burn, even after use. Keep at temperature not exceeding 50°C.

**10.5. Incompatible materials**

Air and oxidizers

**10.6. Hazardous decomposition products**

Under normal conditions of storage and use, hazardous polymerization will not occur.

**SECTION 11: Toxicological information****11.1. Information on toxicological effects****Inhalation**

Isobutane (R-600a) : LC 50 (Rat) : 570000ppm  
Exposure time : 15 min. Test atmosphere :gas

**Skin contact**

Liquid splashes or spray may cause freeze burns. Unlikely to be hazardous by skin absorption.

**Eyes contact**

Liquid splashes or spray may cause freeze burns. Not expected to cause eye irritation based on expert review of the properties of the substance.

**Ingestion**

Highly unlikely - but should this occur freeze burns will result.

**Mutagenicity assessment**

Not classified based on available information.

**Carcinogenicity**

Not classified based on available information.

**Reproductive toxicity**

Not classified based on available information.

**STOT - single exposure**

Not classified based on available information.

**STOT - repeated exposure**

Not classified based on available information.

**SECTION 12: Ecological information****12.1. Toxicity**

Adopt good working practices, so that the product is not released into the environment.

**Acute toxicity:**

Isobutane (R-600a) : LC 50 / 96h / Fish : 27,98 mg / l  
Isobutane (R-600a) : EC 50 / 48h / Daphnia : 14,22 mg / l

**12.2. Persistence and degradability**

Ozone Destruction Potential (ODP): 0

Global Warming Potential (GWP): 3 (relative to the value 1 of the carbon dioxide in 100 years) according to IPCC-AR4/CIE (Fourth Assessment Report of the Intergovernmental Panel on Climate Change) -2007.

**Components:**

Isobutane (R-600a) : approx. 10 years

**12.3. Bioaccumulative potential**

Data not available

**12.4. Mobility in soil**

Data not available

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### 12.5. Results of PBT and vPvB assessment

vPvB Substances: None - PBT Substances: This substance is not considered to be persistent, bioaccumulating and toxic

### 12.6. Other adverse effects

No known significant effects or critical hazards

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste gas should be flared through a suitable burner with flashback arrestor. Empty pressure vessels should be returned to the supplier. Operate in accordance with current local and national regulations.

## SECTION 14: Transport information

### 14.1. UN number

ADR-UN number:	1969
IATA-Un number:	1969
IMDG-Un number:	1969



### 14.2. UN proper shipping name

ADR-Shipping Name:	ISOBUTANE (R-600a)
IATA-Technical name:	ISOBUTANE (R-600a)
IMDG-Technical name:	ISOBUTANE (R-600a)

### 14.3. Transport hazard class(es)

ADR-Class:	2
ADR-Label:	2.1
ADR-Upper number:	23
IATA-Class:	2.1
IATA-Label:	2.1
IMDG-Class:	2.1
IMDG-Label:	2.1

14.4. Packing Group Not applicable

### 14.5. Environmental hazards

Marine pollutant: No

14.6. Special Precautions for User No applicable

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

Not applicable for product as supplied.

## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Regulation EC n.1272/2008 (CLP) and Regulation (EU) n. 2015/830 which replaces Annex II of the Regulation 1907/2006.

This Safety Data Sheet has been prepared in accordance with the current European Directives.

### 15.2. Chemical Safety Assessment

A chemical safety assessment has not been conducted for this product.

**SECTION 16: Other information**

Text of phrases referred to under heading 3:

H220 Extremely flammable gas.

H280 Contains gas under pressure; may explode if heated.

Safety data sheet revised on 30.10.2019 in accordance with Regulation (EU) No. 2015/830

Changes in section: 1,3,7,8,15 and 16.

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.

It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

This MSDS cancels and replaces any preceding release.

The enumeration of the risks, legal, regulation and administrative texts they are not exhaustive, since responsible only one will correspond (fit) to the addressee or user of the product to be sent to the official regulations of storage, manipulation and utilization of these products.

**GLOSSARY**

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

CAS: Chemical Abstracts Service

LC50: Lethal Concentration to 50 % of a test population

CLP: Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008

LD50: Lethal Dose to 50% of a test population (Median Lethal Dose)

COM: The company aims to control exposure in its workplace to this limit.

GHS: Globally Harmonized System.

IATA: International Air Transport Association

IMDG: International Maritime Dangerous Goods

VLA-ED: Value environmental limit daily exhibition.

WEL: The Manufacturer has for aim control the exhibition in the place of work at the level of the standard of the United Kingdom.