

SAFETY DATA SHEET

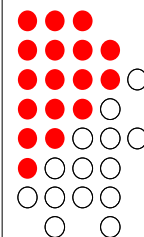
according to Regulation (EC) No1907/2006

R600a

Issue date: 30.06.2011.

Revision: 28.02.2013

Version: 2.00



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

1.1. Product identifier

Product name: R600a
Substance/Mixture: material

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

Identified use: Gas

1.3. Details of the supplier of the safety data sheet

Producer/supplier:: Frigostar Ltd.
Address: 211. Valley Road B'Kara
BKR10 Malta
Phone: 0035679278007
E-mail: info@frigostar.com.mt

Supplier: Vrec-Co Kft.
Address: H-6763 Szatymaz Kossuth u. 12.
Phone: +36-62-283-481
Fax: +36-62-583-550
E-mail: robert@vrec-co.hu

Safety data sheet prepared by: TOXICHEM KFT.
Address: 6721 Szeged Osztróvszky u. 27.
Phone: +36 30 999 77 82
Fax: +36 62 64 12 13
E-mail: info@toxichem.hu

1.4. Emergency telephone number:

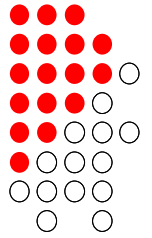
Austria tel.: +431 406 43 43, Belgium tel.: 070/245.245, Bulgaria tel.: +359 2 9154 409, Czech Republic tel.: +420 224 919 293, +420 224 915 402, Denmark tel.: 82 12 12 12, Estonia tel.: 112, Finland tel.: (09) 471 977 (direct) or (09) 4711 (exchange), France tel.: ORFILA (INRS) : + 33 (0)1 45 42 59 59, Ireland tel.: 01 809 2166, Lithuania tel.: +370 5 236 20 52, +370 687 53378, Malta tel.: 2545 0000, Medicines & Poisons Info Office tel.: 2545 6504, Norway tel.:22 59 13 00, Portugal tel.: 808 250 143, Romania tel.: 021.318.36.06 (8:00 - 15:00), Slovakia tel.: +421 2 5477 4166, Spain tel.: + 34 91 562 04 20, Sweden tel.: 112; 08-331231 (9:00-17:00).

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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture:

Hazard Class and Category Code

Regulation EC 1272/2008 (CLP):

Physical hazards : Flammable gases - Category 1 - Danger (H220)
Gases under pressure - Liquefied gas - Warning (H280)

Classification EC 67/548 and EC 1999/45:

F+ Extremely flammable.
R12
See full H- and R- phrases in Section 16.

2.2 Label elements:

1272/2008/EC directive:

Pictograms:



Signal word: **Danger**

Hazard statements:

H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.

Precautionary statements, storage:

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+403 Protect from sunlight. Store in a well ventilated place .

2.3. Other hazards

Physical hazards: Liquefied gas. Being heavier than air, gases may accumulate in lower and/or confined spaces when released.

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SECTION 3: Composition/information on ingredients

3.1. Substances

Components	EU-number	REACH number	CAS-number	Weight %	Classification (Directive 67/548/EEC)	Classification (Regulation (EC) No 1272/2008)
Isobutane	200-857-2	01-2119474691-32	75-28-5	>95	F+; R12	Flam. gas 1, H220 Press. gas, H280

H-statements and R-phrases 16 section below.

SECTION 4: First aid measures

4.1. Description of first aid measures

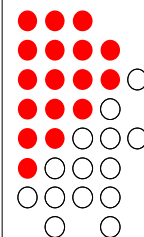
Medical intervention:	Call physician in case of asphyxiation, frostbite or burn.
Inhalation:	Move victim to fresh air and to a safe place and take measures to prevent fire and explosion. Rescue personnel may need breathing apparatus. Let victim lay in rest and muffled. If breathing has stopped, apply artificial breathing or breathing apparatus. If victim is unconscious, lay him on his side in a stable position. Get medical help on site.
Ingestion:	Ingestion is not considered a potential route of exposure.
Skin contact: – frostbite	Wash affected area with water. Contaminated clothes, rings, watch should be removed only if they are not adhered to the skin. Warm affected area slowly.
Eye contact:	Immediately flush eyes thoroughly with water for at least 15 minutes. Obtain medical assistance.

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

Inhalation:	The substance has anaesthetic effect, 1% (1000 ppm) causes sleepiness within a few minutes. In concentrations higher than 10%: narcotic effect: weakness, headache, nausea, dizziness, confusion, blurred sight, increasing sleepiness. Very high concentrations may cause unconsciousness, spasms and finally asphyxia caused by the absence of oxygen.
Ingestion:	Ingestion is not considered a potential route of exposure.
Skin contact:	Frostbite causes by the liquid state.
Eye contact:	Frostbite causes by the liquid state.
Delayed effects:	Not expected.
General:	No information.

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

Advice for physician:	Symptomatic treatment is recommended .
Special equipments at the workplace:	Not necessary.

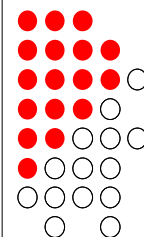


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SECTION 5: Firefighting measures

5.1. Extinguishing media

Applicable extinguishing media Dry chemical powder, foam, carbon dioxide, sand.

Not applicable extinguishing media High-pressure water jet.

5.2. Special hazards arising from the substance or mixture

Specific risk: Exposure to fire may cause containers to rupture/explode.
Special exposure hazards, combustion product, gases formed at
combustion: carbon dioxide, carbon monoxide, hydrocarbons.

5.3. Advice for firefighters

Special protective equipment: Respiratory protective devices. (EN 14593-1), protective
clothing against liquid chemicals. (EN 14605).

Advice: If possible, stop flow of product.
Move away from the container and cool with water from a
protected position.
Use self-contained breathing apparatus and chemically protective
clothing.

Fire classification: F+, R12. Extremely flammable.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal emergency procedures: Evacuate the area.
Extinguish all ignition sources! Try to stop the release!
Wear a self-contained breathing apparatus when entering the area
unless atmosphere is proved to be safe. The affected area in the
direction of the wind and other personnel carrying out damage
control does not stay! The evacuation of persons facing the wind
to be performed, have to wear respiratory protective device (EN
14593).
Ensure adequate air ventilation.

6.2. Environmental precautions

Environmental precautions: Try to stop release. Land of the danger area should be closed. High
safety zone must be established.
Prevent from entering sewers, basements and workpits, or any
place where its accumulation can be dangerous.
Notify the authorities.

6.3. Methods and material for containment and cleaning up

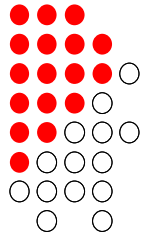
Methods for cleaning up: Ventilate area.

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6.4. Reference to other sections

Personal protective equipment: See the Section 8.
Waste management: See the Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Recommendations for safe handling: This product should be used by properly trained person!
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature.
See more in Section 8.

Fire and explosion protection: Keep in a well-ventilated place, away from heat and ignition sources, electrostatic sources, strong oxidizers and high pressure oxygen. Prevent electrostatic discharges. Smoking is not allowed!

Hygiene standards: The people in contact with product should be maintained the workplace hygiene standards. After the treatment of the product at breaks, before eating, after work the hot hand and face washing is necessary.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures / Storage conditions: Can only be stored in a closed system, should be checked regularly for tightness. Store only in the original packaging. Tightly closed.
Protect from sunlight and sources of heat.
The bottles, containers are stored in an upright position, so as to prevent any contact with the liquid phase from the gas phase designed parts. Do not allow the temperature to rise above 50 ° C.
After use, close the air outlet of the valve.

Incompatible materials: Strong oxidizing agents, high-oxygen-containing materials.

7.3. Specific end use(s)

Special uses: None.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

	CAS-NUMBER	Limit value, Eight hours (mg/m ³)	Limit value, Short term (mg/m ³)	Country
Propane	74-98-6	1800	3600	Austria
		1000	-	Belgium
		1800	3600	Denmark
		1800	7200	Germany (AGS)
		1800	7200	Germany (DFG)
		1800	-	Poland
		1000 (ppm)		Spain
		1800	7200	Switzerland

8.2. Exposure controls

Engineering measures:

Do not inhale the gas! Avoid contact with liquefied gas with eyes or skin! Provide adequate ventilation! Only in closed, leak-proof network. No smoking, open flames and ignition sources related activities are prohibited!

Hygiene standards:

The people in contact with product should be maintained the workplace hygiene standards. After the treatment of the product at breaks, before eating, after work the hot hand and face washing is necessary.

Personal protective equipment

Eye and face protection:

Safety glasses with side-shields (EN 166) or face shield recommended to wear.

Skin protection

Hand protection:

Avoid hand contact. Proper contact is recommended to wear gloves to protect against cold (EN 511).

Other:

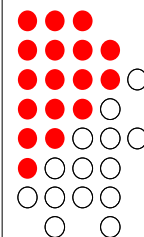
Long-sleeved clothing and anti-static anti-static footwear (EN ISO 2345) must be wear.

Inhalation protection:

In gas leak case, compressed air breathing apparatus (EN 14593) is recommended.

Environmental exposure controls

Environmental exposure control : Prevent from entering sewers, surface waters or soil.

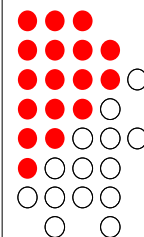


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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical condition (20°C):	Gas
Colour:	Colourless gas
Odour:	Characteristic odor.

Properties

Value

pH (20°C):	Not applicable.
Melting point / Freezing point:	No information.
Initial boiling point and boiling range:	-11 °C
Fire point:	-60 °C
Evaporating rate:	No information.
Flammability:	Extremely flammable.
Upper / lower flammability or explosive limits	
– lower explosive limit:	1,5 %
– upper explosive limit:	8,5 %
Vapor Pressure (40°C):	5,2 bar
Vapor density:	
Relative density, gas:	2,05 (air=1)
Relative density, liquified gas:	No information.
Solubility	
– In water:	24-61 mg/l
– Organic solvents:	No information.
Partition coefficient: n-octanol/water:	Log K _{ow} : 2.8
Auto-ignition temperature:	365 °C
Decomposition temperature:	No information.
Kinematic viscosity:	No information.
Explosive properties:	No information.
Oxidizing properties:	Not oxidising.

9.2. Other information

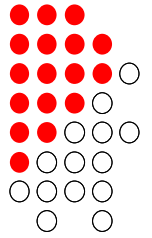
No information.

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

Reactivity: No specific reactivity other than those specified under section 10.5.

10.2. Chemical stability

Stability: Stable in the recommended storage conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions: There are no under normal conditions of use.

10.4. Conditions to avoid

Situations to avoid: Radiating heat, open flame, all ignition sources, sparks.

10.5. Incompatible materials

Materials to avoid: Strong oxidizers.

10.6. Hazardous decomposition products

Hazardous decomposition products: By thermal decomposition: Carbon dioxide, carbon monoxide, hydrocarbons.

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

Acute toxicity: 1%: hypnotic effect, 10%: narcotic effect; higher concentrations: unconsciousness, spasms.

LC₅₀ (mouse, 2 hours) = 286000 ppm (28.6%)LC₅₀ (rat, 4 hours) = 277000 ppm (27.7%)

- Skin: Frostbite/burn may possible.
- Eyes: Frostbite/burn may possible.
- Inhalation: The substance has anaesthetic effect, 1% (1000 ppm) causes sleepiness within a few minutes.
In concentrations higher than 10%: narcotic effect: weakness, headache, nausea, dizziness, confusion, blurred sight, increasing sleepiness.
Very high concentrations may cause unconsciousness, spasms and finally asphyxia caused by the absence of oxygen.
- Ingestion: Ingestion is not considered a potential route of exposure.

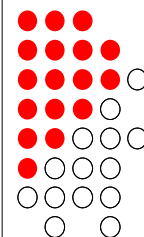
Skin corrosion/irritation: Not irritative.

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Serious eye damage/irritation:	Not irritative.
Respiratory or skin sensitisation:	Not sensitising.
Germ cell mutagenicity:	Not mutagenic (Ames test).
Carcinogenicity:	It contains 1,3-butadiene (lower than 0,1%), not carcinogenic.
Reproductive toxicity:	No information.
STOT-single exposure:	No information.
STOT-repeated exposure:	No information.
Aspiration hazard:	No information.

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

General informations: According to its physical properties, the substance evaporates quickly from an aqueous environment, thus neither acute nor chronic effects practically could not be observed.

12.2. Persistence and degradability

General informations: LPG released into the environment dissipates quickly and undergoes photochemical degradation.

Half-life period: 3.2 days
Degradable in the soil by bacteria (Mycobacterium crassa,
Mycobacterium phlei)

12.3. Bioaccumulative potential

General informations: No information.

log P_{ow} 2,8

12.4. Mobility in soil

- Air: According to its physical properties, the substance evaporates quickly from an aqueous environment, thus neither acute nor chronic effects practically could not be observed.

- Water: Evaporates quickly from water and soil.

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- Soil: Evaporates quickly from water and soil.

12.5. Results of PBT and vPvB assessment

PBT- és a vPvB-assessment: No information.

12.6. Other adverse effects

No information.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Should not be released into the environment. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Material:

Avoid discharge to atmosphere.

According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used. Render harmless by incineration.

Contaminated packaging:

Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14: Transport information

14.1. UN-number

UN-number: UN1965

14.2. UN proper shipping name

International transport: HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.

14.3. Transport hazard class(es)

Classification code 2F

Labels: 2.1

14.4. Packing group

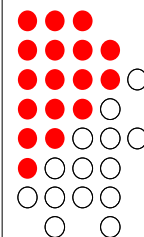
None.

14.5. Environmental hazards

ADR/RID None.

IMDG None.

ADN None.

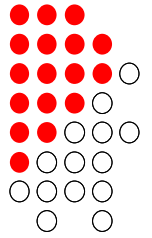


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14.6. Special precautions for user

ADR
Transport category: 2
Tunnel restriction code: (B/D)
Hazard identification No.: 23
Limited quantities: 0
Special provision(s): CV9 CV10 CV36 S2 S20
Shunting labels: Required.

Avoid transport on vehicles where the load space is not separated from the driver's compartment.

Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.

Before transporting product containers ensure that they are firmly secured and:

- cylinder valve is closed and not leaking
- valve outlet cap nut or plug (where provided) is correctly fitted
- valve protection device (where provided) is correctly fitted
- there is adequate ventilation.
- compliance with applicable regulations.

IMDG
EMS Code: F-D, S-U
Stowage category: E

IATA
Proper shipping name: HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.
ERG code: 10L
Limited quantity: forbidden
Passenger and Cargo Aircraft: forbidden
Cargo Aircraft only: 150 kg (200)

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

SECTION 15: Regulatory information

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

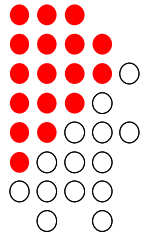
- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- Regulation (EC) no 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.
- Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.

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- Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations.
- Regulation (EC) No 2037/2000 of the European Parliament and of the Council of 29 June 2000 on substances that deplete the ozone layer.
- European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) applicable from 1st of January 2011

15.2. Chemical safety assessment

No information.

SECTION 16: Other information

The risk of choking is often overlooked, so it should be emphasized during the operational training. Users should be trained in the method of artificial respiration.

The full H-statements from the Section 2. and 3. :

- H280: Contains gas under pressure; may explode if heated .
- H220: Extremely flammable gas.

The full R-Phrases from the Section 2. and 3. :

- R12: Extremely flammable.

The safety data sheet comply with Regulation (EU) No. 453/2010.

This safety data sheet serves to complete but not to replace the technical product sheets. The information contained herein is given in good faith and is accurate to the best of knowledge at the date indicated above. It is understood by the user that any use of the product for purposes other than those for which it was designed entails potential risk. The information given herein in no way dispenses the user from knowing and applying all provisions regulating his activity. The user bears sole liability for the precautions required when using the product. The regulatory texts indicated herein are intended to aid the user to fulfill his obligations. This list is not to be considered complete and exhaustive. It is the user's responsibility to ensure that he is subject to no other obligations than those mentioned.

End of safety data sheet.