

# Material Safety Data Sheet

**Product Type:** Refrigerator

**Product Model Number:** for all refrigerators manufactured by Homa.

## R600a Isobutane

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

#### 1.1. Identification of the substance or preparation:

Product code Product name

ISO-Butane OP WS

ISO-Butane OP P

ISO-Butane 97 OP WS

ISO-Butane 97 OP P

CAS No.: 75-28-5

EINECS No.: 200-857-2

EC No.: 601-004-01-8

#### 1.2. Use of substance/preparation:

Raw material for the chemical industry and manufacturing of polymers, fuel, aerosol propellants, Cleaning/washing agents and disinfectants, intermediates, solvents, blowing agents for foams

# Material Safety Data Sheet

## R600a Isobutane

### 2. HAZARDS IDENTIFICATION:

**2.1. Regulatory Compliance:** According to the Hungarian Public Act No. XXV. of 2000 on chemical safety, and Regulation 44/2000(XII. 27.) as modified by the ESZCSM Regulation 33/2004 (IV.26), the substance is classified as hazardous.

**2.2. Hazard Classifications:** Flammable gases: Category 1 - Danger (H220)  
F+, Extremely flammable (H220), R12 R12, S-(2)-9-16-33,  
Gases under Pressure, Liquefied gas (H280)

**Physicochemical Hazards:** The substance is extremely flammable.

**Health Hazards:** The substance is not hazardous under normal conditions. However, an accidental release of high-pressure liquid hydrocarbons may result in increased exposure. The high evaporation rate of the liquid may lead to frostbites, and while acute toxicity is low, the substance is heavier than air and may accumulate in lower and/or confined spaces when released. At 1% (1000 ppm), the substance has an anaesthetic effect, causing sleepiness within a few minutes. Concentrations higher than 10% may result in narcotic effects, including weakness, headache, nausea, dizziness, confusion, blurred sight, increasing sleepiness, unconsciousness, spasms, and ultimately asphyxia caused by the absence of oxygen.

**Environmental Hazards:** The substance evaporates quickly and does not represent a hazard for the soil and water environment.

### 2.3. Label Elements

**Pictogram:**  

**Signal Word:** Danger

**Hazard Statement(s):** H220: Extremely flammable gas.  
H280: Contains gas under pressure; may explode if heated

### 3. COMPOSITION/INFORMATION ON INGREDIENT

**Primary Component:** Isobutane C<sub>4</sub>H<sub>10</sub> (liquefied) - CAS No. 75-28-5 (concentration 100%)

# Material Safety Data Sheet

## R600a Isobutane

### 4. FIRST AID MEASURES:

- **General:** If symptoms persist, or if you feel unwell, seek medical advice.
- **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.
- **Skin contact:** 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:** In the case of eye contact, rinse eyes with plenty of running water for at least 15 minutes. Cover eyes by sterilized dressing material. Call doctor immediately.

### 5. FIRE-FIGHTING MEASURES:

- **Suitable extinguishing media:** Dry chemical powder, foam, carbon dioxide, sand
- **Extinguishing media not to be used for safety reasons:** water jet
- **Special exposure hazards, combustion product, gases formed at combustion:** Carbon dioxide, carbon monoxide, hydrocarbons
- **Special protective equipment for fire-fighters:** Self-contained breathing apparatus. Full protective clothing.

### 6. ACCIDENTAL RELEASE MEASURES:

- **Personal precautions:** Wear protective clothing. Keep persons not involved in rescue at a distance.
- **Environmental precautions:** Prevent from entering sewers, surface waters or soil. In the case of an environmental pollution notify appropriate authorities. Spilled material entering drainage systems may represent explosion hazard. Eliminate all lower and remote ignition sources. Involve experts.
- **Methods for cleaning up:**  
Gas release: Notify fire-brigade, eliminate all ignition sources. If there is a hazard of overexposure to high gas concentrations, use self-contained breathing apparatus. Stop leakage, if this can be done safely. Decrease gas concentration by using water spray. Restrict access to area until gases dissipate. Monitor gas concentration in the hazardous area.

# Material Safety Data Sheet

## R600a Isobutane

### 7. HANDLING AND STORAGE:

#### 7.1. Handling:

Engineering measures: The product should be used in a closed system. Avoid contact with material, eye contact and the inhalation of vapors. Use natural or artificial ventilation to keep airborne vapor concentration below the occupational limit level.

#### 7.2. Storage:

Keep in a well-ventilated place, away from heat and ignition sources, strong oxidizers and high pressure oxygen. Prevent electrostatic discharges. Use spark-proof ventilation system, certified explosion-proof equipment and an electric system with intrinsic safety. Keep regulations concerning the storage tanks and containers of flammable materials, as well as those for the buildings, rooms, maximal allowed quantities and minimal storing distance. Store material away from working processes, production areas, elevators, buildings, exits of rooms and main corridors leading to exits. Do not keep combustible material on storing places. Have an appropriate fire-extinguisher in the storing room (such as an automatic fire extinguishing apparatus, portable extinguishers). All storing and filling units should have an emergency plan.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

#### 8.1. Exposure limit levels:

**MAK (DE) 2350 mg/m<sup>3</sup> limit**  
**OES (UK) 1430 mg/m<sup>3</sup>; limit: 1780 mg/m<sup>3</sup>**  
**TLV/TVA (ACGIH) 800 ppm**

**Hungary: Annex 1 of Regulation 25/2000(IX.30) EüM-SZCSM does not contain limit levels for Isobutane**

#### 8.2. Exposure controls:

##### 8.2.1. Occupational exposure controls:

##### 8.2.1.1. Respiratory protection:

If there is a hazard of overexposure to high gas concentrations, use self-contained breathing apparatus. Breathing Apparatus, BA – ensures breathable air from an independent source. Breathing apparatuses may be applicable in an environment, that is immediately dangerous for life or health (IDLH) or if the oxygen concentration is insufficient.

# Material Safety Data Sheet

## R600a Isobutane

### 8.2.1.2. Hand protection:

Gloves protecting against frostbites and resistant to the substance should be used.

### 8.2.1.3 Eye protection:

Eye protection should comply with standard EN 166

Wear tightly fitting splash-proof protecting goggles or a face shield covering the whole face. The face shield can be fastened to the chin to protect against materials splashing from the working surface.

### 8.2.1.4. Skin protection:

Protective clothing: should be solvent resistant and antistatic.

Skin can be protected from chemicals by wearing protective clothing. Standards relating to protective clothing: EN 465 (1) –type 4, EN 466/1 (2) –type 3 or EN 467 (3). This regulates complete protective clothing and chemical hoods.

Standards EN 369 (4), EN 463 (5) and EN 464 (6) describe the test methods, that are used to determine the resistance of the material of protective clothing to permeation of liquids, to penetration of jets of liquids and to aerosols.

### 8.2.2. Environmental exposure controls:

1. EU (2000) Directive 2000/60/EC of the European Parliament and the Council of 23 October 2000, implementing the frame of Community activities rd concerning environmental exposure controls. Official Journal of the European Communities, No L327, 22.12.2000

2. EU (2000) Commission decision of 17 July 2000 on the establishment of the European Pollution Emission Register (EPER), as the implementation of Article 15 of Council Directive 96/61/EC on integrated pollution prevention and control (IPPC) (2000/479/EC). Official Journal of the European Communities, No L192, 28.07.2000

3. EU (1999) Council Directive 1999/13/EC of 11 March 1999, on the limitation of emissions of volatile organic compounds from organic solvents used by some plants and for some activities. Official Journal of the European Communities, No L85, 29.03.1999

# Material Safety Data Sheet

## R600a Isobutane

### 9. PHYSICAL AND CHEMICAL PROPERTIES:

#### 9.1. General information:

**Appearance:** clean, colorless

The liquefied gas form fog if released.

**Odor:** characteristic

#### 9.2. Important health, safety and environmental information:

**pH:** not applicable

**Boiling point/boiling range:** -11 °C

**Autoignition temperature:** 365 °C

**Fire hazard:** Class "A" stage I.

**Hazchem code:** 2WE

**Explosive properties:**

**Lower explosion limit:** 1.5 %

**Upper explosion limit:** 8.5 %

**Oxidising properties:** not oxidising

**Vapor pressure:** max. 520 kPa (40 °C) (5.2 mbar)  
375 kPa (40 °C) (literature data)

**Liquid density:** 0.506-0.583 g/cm<sup>3</sup> (15 °C)

**Solubility:**

-solubility in water: 0.024 – 0.061 g/l (20°C )

- solubility in fats (solvent – oil should be given): no data available

**Partition coefficient: n-octanol/water:** Log Kow : 2.8

**Viscosity:** no data available

**Vapor density:** 2.05 (air=1)

**Evaporation number:** no data available

#### 9.3. Other information:

**Flash point:** -60°C (PM)

**Vapor volume:** (formed from 1 litre of liquid at 15°C and 101,3 kPa): 235 litre

**Decomposition temperature:** no data available

### 10. STABILITY AND REACTIVITY:

Under normal temperature and pressure conditions the material is stable.

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

10.2 Materials to avoid: Strong oxidizers.

10.3. Hazardous decomposition products: No decomposition occurs at proper storage and use.

# Material Safety Data Sheet

## R600a Isobutane

### 11. TOXICOLOGICAL INFORMATION:

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

**Results of animal tests:**

LC50 (mouse, 2 hours) = 286000 ppm (28.6%)

LC50 (rat, 4 hours) = 277000 ppm (27.7%)

**Acute oral and dermal exposure is not expected on the basis of physical properties.**

**Irritation:** No irritation has been found on animals.

**Sensitization:** No sensitization has been found on animals.

**Sub-chronic toxicity:**

OAEL:inh (rat, 21days)=11.8 mg/l

NOAEL: inh. (rat 90 days) = 4489 ppm

**Mutagenicity:** Not mutagenic (Ames test)

**Carcinogenicity:** As 1,3-butadiene content is below 0.1%, the substance is not carcinogenic.

**Reproductive toxicity:** No data available.

### 12. ECOLOGICAL INFORMATION:

#### 12.1. Ecotoxicity:

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. Mobility:

- **Known or predictable distribution in environmental compartments:** LPG released into the environment dissipates quickly and undergoes photochemical degradation.

- **Surface tension:** No data available.

- **Adsorption/desorption:** No data available.

#### 12.3. Persistence and degradability

Degrades in the troposphere initiated by sunlight

**Half-life period:** 3.2 days

Degradable in the soil by bacteria (Mycobacterium crassa, mycobacterium phlei)

**12.4. Bioaccumulation:** logK Log Pow 2.8

BCF: no data available

### 13. DISPOSAL CONSIDERATIONS:

When released, gases can be effectively localized by water fog or water spray.

According to its physical properties the material does not form waste, and evaporates quickly from water and so il.

# Material Safety Data Sheet

## R600a Isobutane

### 14. TRANSPORT INFORMATION:

- **UN number:** 1969
- Class: ADR/RID: 2
- Proper shipping name: ISOBUTANE

- Marine pollutant: no

- **Other useful information:**

Label: 2.1

Danger number: 23

(Note: R600a Isobutane could be shipped by air.)

### 15. REGULATORY INFORMATION:

**Labeling information:**

iso-Butane OP WS

iso-Butane OP P

iso-Butane 97 OP WS

iso-Butane 97 OP P

EC number: 601-004-01-8

EC label

Hazards classification: F+, extremely flammable, R12

R12, S-(2)-9-16, Gases under Pressure, Liquefied gas (H280)

R: 12: Extremely flammable

S: (2): Keep out of the reach of children.

9: Keep container in a well-ventilated place.

16: Keep away from sources of ignition - No smoking.

33: Take precautionary measures against static discharges.

**„Usability of the substance falls under the restrictions as to the relevant explanations for sections 3.40. of Appendix XVII of Regulation (EC) No 1907/2006 of the European Parliament and of the Council ”**

**Restricted to professional use**

# Material

## R600a Isobutane

### 16. OTHER INFORMATION:

**- R phrases:**

R: 12: Extremely flammable

**- Further information (written references and/or technical information service):** See Chapter 1.4

**- Sources of key information for the compilation of data sheets:**

ECB database, IUCLID, CONCAWE products dossiers and recommendations, test results.

**- Added, deleted or revised information in revised data sheets:**

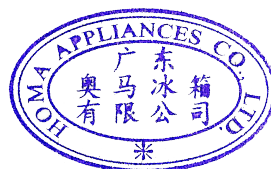
**-2<sup>na</sup> Version:** The new European Chemicals regulation (REACH)

**-3<sup>na</sup> Version:** REACH pre-registration

The information contained herein represents our best knowledge and is intended to facilitate the safe transport and handling of the product. Data in this sheet are informative, they are neither subjects of a commercial contract nor regulative. Compliance with prevailing rules and regulations is the responsibility of the user



Signature: Joshua Gao  
Title: Product Manager



Issue Date: April 2019