Safety Data Sheet

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

Product identifier

Trade name : Refrigerator (Refrigerat R600a - Isobutane)

Chemical description : Isobutane
CAS No :000075-28-5
EC No :200-857-2
Index No :601-004-00-0

Chemical formula : C4H10 / (CH3)2CHCH3

Registration-No. : Registration deadline not expired.

Use : Industrial and professional. Perform risk assessment prior to use.

Company identification : CHANGSHU JINDIHUI CHEMICAL IMP . & EXP.CO.,LTD
FLUOROCHEMICAL INDUSTRY PARK,CHANGSHU
CITY,215522 JIANGSU PROVINCE,CHINA

Emergency telephone number : +86-512-52328081

2 Hazards identification

Classification of the substance or mixture

Hazard Class and Category Code Regulation EC 1272/2008 (CLP)

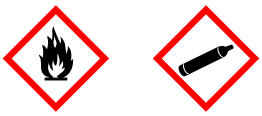
• Physical hazards : Flammable gases - Category 1 - Danger (H220)
Gases under pressure - Liquefied gas - Warning (H280)

Classification EC 67/548 or EC 1999/45 : F+; R12

Label elements

Labelling Regulation EC 1272/2008 (CLP)

• Hazard pictograms



• Hazard pictograms code : GHS02 - GHS04

• Signal word : Danger

• Hazard statements : H220 : Extremely flammable gas.
H280 : Contains gas under pressure; may explode if heated.

• Precautionary statements

- Prevention : P210 : Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

- Response : P377 : Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 : Eliminate all ignition sources if safe to do so.

- Storage : P403 : Store in a well-ventilated place.

Other hazards

Other hazards : None.

3 Composition/information on ingredients

Substance / Mixture : Substance.

Substance name		Contents	CAS No	EC No	Index No	Registration no	Classification
Isobutane	:	99.0-99.9%	75-28-52	00-857-2	601-004-00-0	NOTE 2	F+; R12 --- Flam. Gas 1 (H220) Liq. Gas (H280)

Note 1: Listed in Annex IV / V REACH, exempted from registration.
Note 2: Registration deadline not expired.
Full text of R-phrases see chapter 16

4 First aid measures

First aid measures

- Inhalation : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.
In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

- Skin/eye contact : For liquid spillage - flush with water for at least 15 minutes.

- Ingestion : Ingestion is not considered a potential route of exposure.

Most important symptoms and effects, both acute and delayed : In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.
In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.

Indication of any immediate medical attention and special treatment needed : Obtain emergency medical attention.

5 Fire-fighting measures

Extinguishing media

- Suitable extinguishing media : All known extinguishants can be used.

- Unsuitable extinguishing media : None.

Special hazards arising from the substance or mixture

- Specific hazards : Exposure to fire may cause containers to rupture/explode.

- Hazardous combustion products : Incomplete combustion may form carbon monoxide.

Advice for fire-fighters

- Specific methods : If possible, stop flow of product.
Move away from the container and cool with water from a protected position.
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/ explosive re-ignition may occur. Extinguish any other fire.

- Special protective equipment for fire fighters : In confined space use self-contained breathing apparatus.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures : Evacuate unnecessary personnel.
Ensure adequate air ventilation.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Eliminate ignition sources.

Environmental precautions : Try to stop release.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

Methods and material for containment and cleaning up : Ventilate area.

7 Handling and storage

Precautions for safe handling : Take precautionary measures against static discharge.
Purge air from system before introducing gas.
Suck back of water into the container must be prevented. Do not allow backfeed into the container.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Keep away from ignition sources (including static discharges).
Open valve slowly to avoid pressure shock.

Conditions for safe storage, including any incompatibilities : Segregate from oxidant gases and other oxidants in store.
Keep container below 50°C in a well ventilated place.

Specific end use(s) : Where available, refer to the exposure scenarios identified in the document enclosed to this Material Safety Data Sheet.

8 Exposure controls/personal protection

Control parameters

- Occupational Exposure Limits : Isobutane : TLV© -TWA [ppm] : 800
Isobutane : TLV© -TWA [ppm] : 800

- Recommended monitoring procedures : Ensure adequate ventilation.
Consider the risk of explosive atmospheres.

Exposure controls

- General : Ensure adequate ventilation.
Do not smoke while handling product.

- Respiratory protection : No special respiratory protection equipment is recommended under normal conditions of use with adequate ventilation.

- Hand protection : Leather safety gloves when handling cylinders.

- Skin protection : Skin protection appropriate to the conditions of use should be provided.

- Eye protection : Even though no eye contact is expected under reasonable normal conditions of use, appropriate eye protection should be worn when handling this material.

9 Physical and chemical properties

Information on basic physical and chemical properties

Physical state at 20 °C	: Gas.
Colour	: Colourless gas.
Odour	: Sweetish. Poor warning properties at low concentrations. Stenchant often added.
Molecular weight	: 58
Melting point [°C]	: -159
Boiling point [°C]	: -12
Critical temperature [°C]	: 135
Vapour pressure [20°C]	: 3 bar
Relative density, gas (air=1)	: 2
Relative density, liquid (water=1)	: 0.59
Solubility in water [mg/l]	: 54
Flammability range [vol% in air]	: 1.5 to 8.5
Auto-ignition temperature [°C]	: 460

Other information

Other data	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10 Stability and reactivity

Reactivity	: May react violently with oxidants. May react violently with alkalis.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Can form explosive mixture with air.
Conditions to avoid	: Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Incompatible materials	: Air, Oxidisers.
Hazardous decomposition products	: None.

11 Toxicological information

Information on toxicological effects	: No known toxicological effects from this product.
- Inhalation	: Asphyxiant gas.
- Dermal	: Prolonged or repeated contact may cause skin to become dry or cracked.
- Ocular	: May cause eye irritation.
- Ingestion	: Ingestion is not considered a potential route of exposure.
Rat inhalation LC50 [ppm/4h]	: No data available.

12 Ecological information

Toxicity	: No known ecological damage caused by this product.
Persistence and degradability	: Biodegradable.
Bioaccumulative potential	: None.
Mobility in soil	: Not applicable.
Results of PBT and vPvB assessment	: Not applicable.
Other adverse effects	
- Ecological effects information	: No known ecological damage caused by this product.

13 Disposal considerations

Waste treatment methods

- General : Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor.
Do not discharge into any place where its accumulation could be dangerous.
Contact supplier if guidance is required.

- Disposal method : Consult supplier for specific recommendations.

14 Transport information

For CompleteCooler System Shipments Surface Shipments: Refrigerating machines, 2.1, UN 3358, containing flammable, non toxic liquefied gas

- UN number : 3358

- Labelling ADR, IMDG, IATA

: 2.1 : Refrigerating machines containing flammable, non toxic liquefied gas

Land transport

ADR/RID

- H.I. nr : 23

- UN proper shipping name : Refrigerating machines containing flammable, non toxic liquefied gas

- Transport hazard class(es) : 2

- ADR/RID Classification code : 2 F

- Packing Instruction(s) - General : P200

Sea transport

IMO-IMDG code

- Proper shipping name : Refrigerating machines containing flammable, non toxic liquefied gas

- Class : 2.1

- IMO Packing group : P200

- IMDG-Marine pollution : NO

- Emergency Schedule (EmS) - Fire : F-D

- Emergency Schedule (EmS) - Spillage : S-U

- Instructions - Packing : P200

Air transport

ICAO/IATA

- Proper shipping name : Refrigerating machines containing flammable, non toxic liquefied gas

- Class : 2.1

- Passenger and Cargo Aircraft : DO NOT LOAD IN PASSENGER AIRCRAFT.

- Cargo Aircraft only : Allowed.

- Packing instruction : 200

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

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture : Ensure all national/local regulations are observed.

Seveso regulation 96/82/EC : Listed

16 Other information

Ensure operators understand the flammability hazard.
Contact with liquid may cause cold burns/frostbite.
The hazard of asphyxiation is often overlooked and must be stressed during operator training.
Receptacle under pressure.

List of full text of R-phrases in section 3. : R12 : Extremely flammable.

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws.

DISCLAIMER OF LIABILITY : Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.
Details given in this document are believed to be correct at the time of going to press. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

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