

Material Safety Data Sheet

This MSDS adheres to the standards and regulatory requirements of China and may not meet the regulatory requirements in other countries.

SECTION I – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name in English : Isobutane

Synonyms: 2-Methylpropane, Trimethylmethane, R600a, HC-600a

Formula: C₄H₁₀, (CH₃)₂CHCH₃

Supplier: Cantaş İç ve Dış Ticaret Soğutma Sistemleri A.Ş.

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SECTION II – COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Nature : (Pure)Substance

Chemical Name : Isobutane

Concentration: >=99.50%; >= 99.95%

CAS-No.: 75-28-5

SECTION III – HAZARDS IDENTIFICATION

Hazardous Classification: Class 2.1 Compressed Gas and Liquefied Gas: Combustible Gas.

Primary Routes of Entry: Inhalation.

Emergency Overview: DANGER! Flammable liquid and gas under pressure. Can form explosive mixtures with air. May cause frostbite. May cause dizziness and drowsiness.

Potential Health Effects

Skin: Contact with evaporating liquid can cause frostbite.

Eyes: Liquid can cause severe irritation, redness, tearing, blurred vision, and freeze burns.

Inhalation: Inhalation of vapor may produce anesthetic effects and feeling of euphoria.

Prolonged overexposure can cause rapid breathing, headache, dizziness, narcosis, unconsciousness, and death from asphyxiation, depending on concentration and time of exposure.

Ingestion : This product is a gas at normal temperature and pressure, but frostbite of the lips and mouth may result from contact with the liquid.

SECTION IV – FIRST AID MEASURES

Eyes: Rinse thoroughly with plenty of water, also under the eyelids. Consult a physician.

Skin: In case of contact, flush skin with water for 15 minutes. Treat for frostbite if necessary by gently warming affected area. Get medical attention if irritation is present.

Inhalation: PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO PRODUCT. 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.

Ingestion: Do not induce vomiting. Contact a physician immediately.

Advice to Physician: If unconscious place in recovery position and seek medical advice. Never give anything by mouth to an unconscious person. If breathing is irregular or stopped, administer artificial respiration. If symptoms persist, call a physician.

SECTION V – FIRE FIGHTING MEASURES

Unusual Fire and Explosion Hazards: Isobutane is heavier than air and may travel along the ground or may be moved by ventilation systems and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, static discharge, or other ignition sources at locations distant from material handling point.

Fire Fighting Instructions: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately.

SECTION VI – ACCIDENTAL RELEASE MEASURES

Personal Precautions: Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment. Shut off gas supply if this can be done safely.

Environmental Precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for Cleaning-up: Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away. Isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering.

In Case of Spill or Other Release: (Always wear recommended personal protective equipment.) Evacuate unprotected personnel. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return until air has been tested and determined safe, including lowlying areas.

SECTION VII – HANDLING AND STORAGE

Handling: Avoid breathing vapors and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders.

Storage: Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Cylinder temperature should not exceed 51.7°C. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

Authorized Limit Values: Isobutane

USA TVL- TWA = 1000 ppm.

800 ppm (1900 mg/m³) NIOSH recommended TWA 10 hour(s)

CHINA MAC: No information available.

Engineering Controls: Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

Personal Protection:

Respiratory Protection: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. Any supplied-air respirator with a full facepiece that is operated in pressure-demand or other positive pressure mode.

Hand Protection: Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eye Protection: For the gas: Eye protection is not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin Protection: For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

Additional Recommendations: Handle in accordance with good industrial hygiene and safety practice. No smoking in the working area. Avoid long-time contact.

SECTION IX – PHYSICAL & CHEMICAL PROPERTIES

Appearance: Gas

Color/Colour: Colorless/colourless

Odor/Odour: faintly sweet odor

Molecular Weight: 58.14

Freezing Point: -159.6°C

Boiling Point(1,013 hPa): - 11.8°C

Vapor Pressure: 30.58 psig (21.1°C)

Vapor Density (air=1): 2.01

Density(water=1): 0.56 g/cm³ (25°C)

Solubility: Water 0.008 % (25°C)

pH: Neutral

Autoignition Temperature: 475.85 °C

Application: Refrigerant for CFC-12 substitute.

SECTION X – STABILITY AND REACTIVITY

Stability: The product is stable under normal conditions. Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Containers may rupture or explode if exposed to heat.

Incompatibility with Other Materials: Oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide (CO₂).

Hazardous Polymerization: Will not occur.

SECTION XI – TOXICOLOGICAL INFORMATION

Toxicity Data: Inhalation 15-minute LC₅₀: 570,000 ppm in rats.

Toxic effects noted in animals from exposure by inhalation include cardiac sensitization, central nervous system effects, anesthetic effects, and respiratory effects. No animal test reports are available to define carcinogenic, embryotoxic, or reproductive hazards. Tests in bacterial or mammalian cell cultures demonstrate no mutagenic activity.

Target Organs: Central nervous system

Additional Data: Stimulants such as epinephrine may induce ventricular fibrillation.

SECTION XII – ECOLOGICAL INFORMATION

General: No adverse ecological effects expected. Isobutane does not contain any Class I or Class II ozone depleting chemicals. Isobutane is not listed as a marine pollutant by DOT.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation (carbon oxides (CO, CO₂) and water.) are not toxic.

SECTION XIII – DISPOSAL CONSIDERATIONS

Waste Treatment: Waste from residues / unused products: Can be used after re-conditioning. Contaminated packaging. Product removed from the cylinder must be disposed of in accordance with appropriate National and local regulation. Return cylinders with residual product to the supplier (FLTCO).

SECTION XIV – TRANSPORT INFORMATION

Classification Code : 21012.

UN-No. : 1969.

Marking : 4.

Primary label: Combustible Gas.

Packing group : II.

Packing Method: Steel cylinder 40L 20KG net/ Steel cylinder 118L 50KG net.

SECTION XV – REGULATORY INFORMATION

- * Common dangerous chemical classification and labelling (GB13690-92).
- * Regulations on the Control over Safety of Dangerous Chemicals (State Council Decree 344 [2002]).
- * Regulations on Labor Protection in Workplaces with Toxic Substances (State Council Decree 352 [2002]).
- * Regulations on the Safety Use of Chemicals in Workplaces (Department of Labor, Reg 423 [1996]), are enacted to control the safe use, production, storage, transport, operation, trade and disposal of dangerous chemicals.

SECTION XVI – OTHER INFORMATION

Sources of key data used to compile the datasheet:

- * Material Safety Data Sheet/Isobutane, AIRGAS,INC. (MSDS No.001030)
- * Material Safety Data Sheet/Isobutane, The BOC Group, Inc. (MSDS No. G-95)
- * Material Safety Data Sheet/Isobutane, Praxair Technology, Inc.(MSDS No. P-4613-C)
- * Material Safety Data Sheet/Isobutane, National Refrigerants,Inc. (July,2005)
- * Material Safety Data Sheet/Isobutane, MATHESON TRI-GAS, INC. (Dec, 2000)

Department: Foreign Trade Dept; Enviroment, Safety and Quality Management Dept.

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Other Information:

HMIS Classification: Health – 1, Flammability – 4, Physical Hazard - 2

NFPA Classification: Health – 0, Flammability – 4, Instability – 0

ANSI/ASHRAE 34 Safety Group – A1

The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. It is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification.

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