

ACE R-600a

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: ACE R-600a
Common Name: Isobutane
CAS Number: 75-28-5
Product Use: Refrigerant

Supplier Details: Atlantic Chemical Inc.
3471 Atlanta Ind Pkwy
Atlanta, GA 30331 USA

Contact:
Phone: 404-505-6626
Fax: 404-505-9607
Email:
Internet: www.acechempro.com
Emergency: Chemtrec 1-800-424-9300

2. HAZARDS IDENTIFICATION**Classification of Substance****GHS Classification in Accordance with 29 CFR 1910 (OSHA HCS):**

Physical, Flammable Gases, 1
Physical, Flammable Liquids, 3
Physical, Gases Under Pressure, Liquefied Gas
Health, Skin corrosion/irritation, 2
Health, Respiratory or skin sensitization, 1 Skin
Environmental, Hazards to the aquatic environment - Acute, 1
Environmental, Hazards to the aquatic environment - Chronic, 1

GHS Label Elements, Including Precautionary Statements

GHS Signal Word: **DANGER**

GHS Hazard Pictograms:



GHS Hazard Statements:

H220 - Extremely flammable gas
H226 - Flammable liquid and vapor
H280 - Contains gas under pressure; may explode if heated
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects

GHS Precautionary Statements:

P210 - Keep away from heat/sparks/open flames/hot surfaces.
P240 - Ground/bond container and receiving equipment.
P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 - Use only non-sparking tools.

- P243 - Take precautionary measures against static discharge.
- P261 - Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
- P264 - Wash skin thoroughly after handling.
- P272 - Contaminated work clothing should not be allowed out of the workplace.
- P273 - Avoid release to the environment.
- P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection.
- P303 + P361 + P353 - IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- P321 - Specific treatment (see supplemental first aid instructions on this label).
- P333 + P313 - If skin irritation or rash occurs: Get medical advice/ attention.
- P362 - Take off contaminated clothing and wash before reuse.
- P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
- P391 - Collect spillage.
- P403 + P235 - Store in a well-ventilated place. Keep cool.
- P410 + P403 - Protect from sunlight. Store in a well-ventilated place.
- P501 - Dispose of contents/ container to an approved waste disposal plant.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Ingredients:		
CAS#	%	Chemical Name:
75-28-5	99%	Isobutane
	1%	Trade secret

4. FIRST AID MEASURES

- Inhalation:** Obtain medical attention if breathing difficulty persists. First, take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate respirator protective equipment, use the buddy system), then remove the exposed person to fresh air. Keep at rest in a position comfortable for breathing.
- Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists. Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.
- Eye Contact:** Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.
- Ingestion:** Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

Most Important Symptoms and Effects Both Acute and Delayed

General: May cause frostbite on contact with the liquid. Asphyxia by lack of oxygen: risk of death.

Inhalation: In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness and death.

Skin Contact: Contact with gas/liquid escaping the container can cause frostbite and freeze burns.

Eye Contact: Contact with gas/liquid escaping the container can cause frostbite, freeze burns, and permanent eye damage.

Ingestion: Not considered a potential route of exposure but contact with gas/liquid escaping the container can cause freeze burns and frostbite.

Chronic Symptoms: None known.

Indication of any immediate medical attention and special treatment needed: If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label on hand.

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5. FIRE FIGHTING MEASURES

Advice for Firefighters:

Precautionary Measures Fire: Exercise caution when fighting any chemical fire. Vapors are heavier than air and may travel considerable distance to an ignition source and flash back to source of vapors.

Firefighting Instructions: Use water spray or fog for cooling exposed containers. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Carbon oxides (CO, CO₂). Hydrocarbons. Toxic vapors.

Other Information: Use water spray to disperse vapors.

Extinguishing Media

Suitable Extinguishing Media: Do not extinguish burning gas if flow cannot be shut off immediately. Extinguish secondary fires with appropriate materials.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

Special Hazards Arising from the Substance or Mixture

Fire Hazard: Extremely flammable gas.

Explosion Hazard: May form flammable/explosive vapor-air mixture. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

Reactivity: Hazardous reactions will not occur under normal conditions.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Gas/vapor is heavier than air. May accumulate in confined spaces, particularly at or below ground level. Eliminate every possible source of ignition. Do not get in eyes, on skin, or on clothing. Do not breathe vapors or gas.

No Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Evacuate unnecessary personnel, isolate, and ventilate the area.

Environmental Precautions

Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up

For Containment: Stop leak if possible without risk. As an immediate precautionary measure, isolate spill or leak area in all directions.

Methods for Cleaning Up: Stop the source of the release, if safe to do so. Consider the use of water spray to disperse vapors. Isolate the area until gas has dispersed. Ventilate and gas test area before entering. Contact competent authorities after a spill

Reference to Other Sections

See Heading 8. Exposure controls and personal protection. For further information refer to section 13.

7. HANDLING AND STORAGE

Handling Precautions:

Additional hazards when Processed: Handle empty containers with care because residual vapors are flammable. Ruptured cylinders may rocket. Do not pressurize, cut or weld containers. Ensure adequate

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ventilation. Asphyxiating gas at high concentrations.

Precautions for Safe Handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Avoid prolonged contact with eyes, skin and clothing. Do not breathe gas. No smoking!

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

Storage Requirements:

Conditions for Safe Storage, including any incompatibilities

Technical measures: Comply with applicable regulations. Proper grounding procedures to avoid static electricity should be followed.

Storage Conditions: Keep container closed when not in use. Store in a dry, cool place. Keep/store away from direct sunlight, extremely high or low temperatures and incompatible materials. Cylinders should be stored upright.

Incompatible Materials: Strong acids, strong bases, strong oxidizers

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Used explosion-proof equipment. Proper grounding procedures to avoid static electricity should be followed. Gas detectors should be used when flammable gases or vapors may be released. Oxygen detectors should be used when asphyxiation gases may be released.

Personal Protective Equipment:

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Personal protective equipment

Respiratory protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching gloves outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Full contact Material: Fluorinated rubber Minimum layer thickness: 0.7 mm Break through time: 480 min Material tested: Vitoject (KCL 890 / Aldrich Z677698, Size M)

Splash protection: Material: Nitrile rubber Minimum layer thickness: 0.4 mm Break through time: 60 min Material tested: Camatril (KCL 730 / Aldrich Z677442, Size M) data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374 If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an Industrial Hygienist familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Eye protection: Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection: impervious clothing, flame retardant antistatic protective clothing. trad The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

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Personal protective equipment

Eye/face protection: Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching gloves outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact: Material: Nitrile rubber Minimum layer thickness: 0.4 mm Break through time: 480 min
Material tested: Camatril (KCL 730 / Aldrich Z677442, Size M)

Splash contact: Material: Nitrile rubber Minimum layer thickness: 0.11 mm Break through time: 30 min
Material tested: Dermatril (KCL 740 / Aldrich Z677272, Size M) data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374 If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection: Complete suit protecting against chemicals, flame retardant antistatic protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi- purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

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Components with workplace control parameters

TWA 1,000 ppm USA. ACGIH Threshold Limit Values (TLV) Central Nervous System impairment Cardiac sensitization

TWA 800 ppm USA. NIOSH Recommended Exposure Limits 1,900 mg/m³

Also see specific listing for n-Butane.

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Components with workplace control parameters

TWA 30 ppm USA. Workplace Environmental Exposure Levels (WEEL)

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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Colorless	Solubility:	Water: 0.008%
Physical State:	Gas	Auto Ignition Temp:	460°C/860°F
Odor:	Amine odor	Vapor Pressure @ 70°F:	31 psig
Specific Gravity or Density:	0.564	Melting Point:	-160°C/-256°F
Viscosity:	N/A	Evap Rate:	> 1
Boiling Point:	10.9°F	Flash Point:	-85°C (-18°F)
Flammability:	Extremely flammable gas	ODS:	0

10. STABILITY AND REACTIVITY

Reactivity:	Hazardous reactions will not occur under normal conditions.
Chemical Stability:	Contains gas under pressure; may explode if heated.
Conditions to Avoid:	Direct sunlight, extremely high or low temperatures, open flames, sources of ignition and incompatible materials.
Materials to Avoid:	Strong acids, strong bases, strong oxidizers
Hazardous Decomposition:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Isobutane cas#:(75-28-5) [99%]

Information on toxicological effects Acute toxicity:

Oral LD50 no data available Inhalation LC50

Dermal LD50

Other information on acute toxicity

Skin corrosion/irritation: no data available

Serious eye damage/eye irritation: no data available Respiratory or skin sensitization: no data available Germ cell mutagenicity: no data available Carcinogenicity:

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: no data available Teratogenicity: no data available

Specific target organ toxicity - single exposure (Globally Harmonized System):

no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System): no data available

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Aspiration hazard: no data available

Potential health effects: Inhalation May be harmful if inhaled. May cause respiratory tract irritation. Ingestion May be harmful if swallowed. Skin May be harmful if absorbed through skin. May cause skin irritation. Eyes May cause eye irritation.

Signs and Symptoms of Exposure: narcosis, Dermatitis Synergistic effects: no data available

Additional Information:

RTECS: TZ4300000

Trade secret [1%]

Information on toxicological effects Acute toxicity:

LD50 Oral - rat - 5,300 mg/kg Inhalation: no data available Dermal: no data available

Skin corrosion/irritation: Skin - rabbit Result: Skin irritation - 24h Serious eye damage/eye irritation: no data available Respiratory or skin sensitization: Germ cell mutagenicity:

no data available Carcinogenicity:

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: no data available

Specific target organ toxicity - single exposure: no data available Specific target organ toxicity - repeated exposure: no data available

Aspiration hazard: no data available

Additional Information:

RTECS: OS8100000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

Isobutane cas#:(75-28-5) [99%]

Information on ecological effects Toxicity: no data available

Persistence and degradability: no data available Bioaccumulative potential: no data available

Mobility in soil: no data available

PBT and vPvB assessment: no data available Other adverse effects: no data available

Trade secret [1%]

Information on ecological effects Toxicity:

Toxicity to fish LC50 - Oncorhynchus mykiss (rainbow trout) - 80 mg/l - 96.0 h. Toxicity to daphnia and EC50 - Daphnia magna (Water flea) - 17 mg/l - 48 h. other aquatic invertebrates

Persistence and degradability: no data available Bioaccumulative potential: no data available Mobility in soil: no data available

Results of PBT and vPvB assessment PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Very toxic to aquatic life.

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13. DISPOSAL CONSIDERATIONS

Isobutane cas#:(75-28-5) [99%] Waste treatment methods

Product: Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging: Dispose of as unused product.

Trade secret [1%] Waste treatment methods

Product: Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging: Dispose of as unused product.

14. TRANSPORT INFORMATION

ID8000, Consumer commodity, 9

IMDG: UN1969, Isobutane, 2.1

IATA: UN1969, Isobutane, 2.1

15. REGULATORY INFORMATION

[%] RQ (CAS#) Substance - Reg Codes

[99%] Isobutane (75-28-5) MASS, PA, TSCA

[1%] Trade secret TSCA

This product does not contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Regulatory Code Legend

MASS = MA Massachusetts Hazardous Substances List

PA = PA Right-To-Know List of Hazardous Substances

TSCA = Toxic Substances Control Act

16. OTHER INFORMATION

Disclaimer:

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

Date: 1.1.2019