



SAFETY DATA SHEET

R-600a

According to the REACH etc. (Amendment etc.) (EU Exit) Regulations 2020 No. 1577, as amended.
According to Regulation (EC) No 1907/2006, Annex II, as amended.
Commission Regulation (EU) 2020/878 of 18 June 2020.

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

1.1. Product identifier

Product name	R-600a
Chemical name	Isobutane
CAS No	75-28-5
EC No	200-857-2

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

Identified uses	Industrial use. Manufacture of substance, Distribution of substance, Propellants
	Use a fuel, Blowing agent, Formulation & (re)packing of Substances and Mixtures
	Polymer production, Polymer processing, Functional fluid
	Professional use: Use a fuel, Propellants, Polymer processing, Functional fluid
	Consumer use: Use a fuel, Propellants, Functional fluid, Blowing agent

1.3. Details of the supplier of the safety data sheet

Supplier	Cantaş Kimya Sanayi ve Ticaret A.Ş. Çerkeşli Mahallesi, Gebze V (Kimya) İhtisas OSB, Fatma Börü Caddesi No:5/1 41455 Dilovası/ Kocaeli Tel: 0212 910 1260 / (Monday - Friday, 8:30 am-5:30 pm) E-posta: info@cantaskimya.com
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1.4. Emergency telephone number

Emergency telephone	Cantaş: +90 212 910 12 60
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SECTION 2: Hazards identification

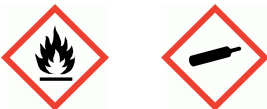
2.1. Classification of the substance or mixture

Classification (SI 2019 No. 720) / (EC 1272/2008)

Physical hazards	Flam. Gas 1A - H220 Press. Gas (Liq.) - H280
Health hazards	Not Classified
Environmental hazards	Not Classified

2.2. Label elements

Hazard pictograms





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Signal word	Danger
Hazard statements	H220 Extremely flammable gas. H280 Contains gas under pressure; may explode if heated.
Precautionary statements	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P102 Keep out of reach of children. P243 Take action to prevent static discharges. P320 Specific treatment is urgent (see medical advice on this label). P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381 In case of leakage, eliminate all ignition sources. P410+P403 Protect from sunlight. Store in a well-ventilated place. P501 Dispose of contents/ container in accordance with international regulations.

2.3. Other hazards

Inhalation may produce health damage. Cumulative effects may result following exposure. May produce discomfort of the respiratory system. Repeated exposure potentially causes skin dryness and cracking. Vapours potentially cause drowsiness and dizziness.

SECTION 3: Composition/information on ingredients

3.1. Substances

Isobutane	> 99%
CAS number: 75-28-5	EC number: 200-857-2
Lists: REACH ANNEX XVII.(40)	
Classification	
Flam. Gas 1A - H220	
Press. Gas (Liq.) - H280	

The full text for all hazard statements is displayed in Section 16.

Composition comments Workplace exposure limits are shown in section 8.

Formula C₄H₁₀, (CH₃)₂CHCH₃



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SECTION 4: First aid measures

4.1. Description of first aid measures

General information	Get medical attention immediately. Show this Safety Data Sheet to the medical personnel.
Inhalation	Remove affected person from source of contamination. Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Maintain an open airway. Loosen tight clothing such as collar, tie or belt. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Place unconscious person on their side in the recovery position and ensure breathing can take place.
Ingestion	Remove any dentures. Stop if the affected person feels sick as vomiting may be dangerous. Do not induce vomiting unless under the direction of medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Place unconscious person on their side in the recovery position and ensure breathing can take place. Maintain an open airway. Loosen tight clothing such as collar, tie or belt.
Skin contact	Rinse with water. Get medical attention if symptoms are severe or persist after washing.
Eye contact	Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 10 minutes.
Protection of first aiders	First aid personnel should wear appropriate protective equipment during any rescue.

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

General information	See Section 11 for additional information on health hazards. The severity of the symptoms described will vary dependent on the concentration and the length of exposure.
Inhalation	May cause respiratory irritation.
Ingestion	Due to the physical nature of this product, it is unlikely that ingestion will occur.
Skin contact	No specific symptoms known.
Eye contact	No specific symptoms known. May be slightly irritating to eyes.

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

Notes for the doctor	Treat symptomatically.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Extinguish with foam, carbon dioxide, dry powder or water fog. Use fire-extinguishing media suitable for the surrounding fire.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.



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5.2. Special hazards arising from the substance or mixture

Specific hazards Containers can burst violently or explode when heated, due to excessive pressure build-up. Vapours are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back.

Hazardous combustion products Carbon monoxide (CO). Carbon dioxide (CO₂).

5.3. Advice for firefighters

Protective actions during firefighting Avoid breathing fire gases or vapours. Evacuate area. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. If a leak or spill has not ignited, use water spray to disperse vapours and protect men stopping the leak. Control run-off water by containing and keeping it out of sewers and watercourses. If risk of water pollution occurs, notify appropriate authorities.

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Firefighter's clothing will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions No action shall be taken without appropriate training or involving any personal risk. Keep unnecessary and unprotected personnel away from the spillage. Wear protective clothing as described in Section 8 of this safety data sheet. Follow precautions for safe handling described in this safety data sheet. Wash thoroughly after dealing with a spillage. Ensure procedures and training for emergency decontamination and disposal are in place. Do not touch or walk into spilled material. Provide adequate ventilation.

6.2. Environmental precautions

Environmental precautions Exposure to aquatic environment unlikely. Large Spillages: Inform the relevant authorities if environmental pollution occurs (sewers, waterways, soil or air).

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Wear protective clothing as described in Section 8 of this safety data sheet. Clear up spills immediately and dispose of waste safely. Approach the spillage from upwind. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.



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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions

Read and follow manufacturer's recommendations. Wear protective clothing as described in Section 8 of this safety data sheet. Keep away from food, drink and animal feeding stuffs. Do not handle until all safety precautions have been read and understood. Do not handle broken packages without protective equipment. Eliminate all sources of ignition. Vapours are heavier than air and may travel along the floor and accumulate in the bottom of containers.

Advice on general occupational hygiene

Wash promptly if skin becomes contaminated. Take off contaminated clothing. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Wash at the end of each work shift and before eating, smoking and using the toilet. Change work clothing daily before leaving workplace.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions

Store away from incompatible materials (see Section 10). Store in accordance with local regulations. Keep only in the original container. Keep container tightly closed, in a cool, well ventilated place. Keep horizontal design tube/drum/tanks horizontal, vertical design tube/drum/tank upright. Protect containers from damage. Protect from sunlight. Bund storage facilities to prevent soil and water pollution in the event of spillage. The storage area floor should be leak-tight, jointless and not absorbent. Store at temperatures not exceeding 54°C.

7.3. Specific end use(s)

Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

Occupational exposure limits

Long-term exposure limit (8-hour TWA): WEL 1000 ppm 4240 mg/m³

Isobutane

Long-term exposure limit (8-hour TWA): 600 ppm

Short-term exposure limit (15-minute): 750 ppm

Butane

Long-term exposure limit (8-hour TWA): WEL 600 ppm 1450 mg/m³

Short-term exposure limit (15-minute): WEL 750 ppm 1810 mg/m³

propane

Long-term exposure limit (8-hour TWA): 1000 ppm 1800 mg/m³

Short-term exposure limit (15-minute): 2.8 mg/m³

WEL = Workplace Exposure Limit.



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8.2. Exposure controls

Protective equipment



Appropriate engineering controls

Provide adequate ventilation. Personal, workplace environment or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Use process enclosures, local exhaust ventilation or other engineering controls as the primary means to minimise worker exposure. Personal protective equipment should only be used if worker exposure cannot be controlled adequately by the engineering control measures. Ensure control measures are regularly inspected and maintained. Ensure operatives are trained to minimise exposure.

Eye/face protection

Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. Personal protective equipment that provides appropriate eye and face protection should be worn. Unless the assessment indicates a higher degree of protection is required, the following protection should be worn: Tight-fitting safety glasses.

Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. To protect hands from chemicals, wear gloves that are proven to be impervious to the chemical and resist degradation. To protect hands against cold burns, gloves must comply with the EN 511 standard. Considering the data specified by the glove manufacturer, check during use that the gloves are retaining their protective properties and change them as soon as any deterioration is detected. Frequent changes are recommended.

Other skin and body protection

Appropriate footwear and additional protective clothing complying with an approved standard should be worn if a risk assessment indicates skin contamination is possible.

Hygiene measures

Provide eyewash station and safety shower. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Clean equipment and the work area every day. Good personal hygiene procedures should be implemented. Wash at the end of each work shift and before eating, smoking and using the toilet. When using do not eat, drink or smoke. Preventive industrial medical examinations should be carried out. Warn cleaning personnel of any hazardous properties of the product.

Respiratory protection

Respiratory protection complying with an approved standard should be worn if a risk assessment indicates inhalation of contaminants is possible. Ensure all respiratory protective equipment is suitable for its intended use and is 'UKCA'-marked. Check that the respirator fits tightly and the filter is changed regularly. Gas and combination filter cartridges suitable for intended use should be used. Full face mask respirators with replaceable filter cartridges suitable for intended use should be used. Half mask and quarter mask respirators with replaceable filter cartridges suitable for intended use should be used.

Environmental exposure controls Keep container tightly sealed when not in use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Gas.
Colour	Colourless.
Odour	Odourless.



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pH	Not applicable.
Melting point	-159,6°C
Initial boiling point and range	-11,7°C
Flash point	-83°C Closed cup.
Evaporation rate	Not applicable.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	Lower flammable/explosive limit: 1,8 % Upper flammable/explosive limit: 8,4 %
Vapour pressure	45 psia @ 70°F
Vapour density	2,06
Solubility(ies)	Slightly soluble in water.
Partition coefficient	No information available.
Auto-ignition temperature	420°C
Decomposition Temperature	435°C
Viscosity	No information available.
Explosive properties	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.
Oxidising properties	No information available.
Particle characteristics	No information available.
9.2. Other information	
Other information	No information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity See the other subsections of this section for further details.

10.2. Chemical stability

Stability Stable at normal ambient temperatures and when used as recommended. Stable under the prescribed storage conditions.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions No potentially hazardous reactions known.

10.4. Conditions to avoid

Conditions to avoid Avoid excessive heat for prolonged periods of time. Containers can burst violently or explode when heated, due to excessive pressure build-up.

10.5. Incompatible materials

Materials to avoid Strong oxidising agents.



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10.6. Hazardous decomposition products

Hazardous decomposition products Does not decompose when used and stored as recommended. Thermal decomposition or combustion products may include the following substances: Harmful gases or vapours. Carbon monoxide (CO). Carbon dioxide (CO₂).

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity - oral
Notes (oral LD₅₀) Based on available data the classification criteria are not met.

Acute toxicity - dermal
Notes (dermal LD₅₀) Based on available data the classification criteria are not met.

Acute toxicity - inhalation
Notes (inhalation LC₅₀) Based on available data the classification criteria are not met.

Skin corrosion/irritation
Skin corrosion/irritation Based on available data the classification criteria are not met.

Serious eye damage/irritation
Serious eye damage/irritation Based on available data the classification criteria are not met.

Respiratory sensitisation
Respiratory sensitisation Based on available data the classification criteria are not met.

Skin sensitisation
Skin sensitisation Based on available data the classification criteria are not met.

Germ cell mutagenicity
Genotoxicity - in vitro Based on available data the classification criteria are not met.

Carcinogenicity
Carcinogenicity Based on available data the classification criteria are not met.

IARC carcinogenicity None of the ingredients are listed or exempt.

Reproductive toxicity
Reproductive toxicity - fertility Based on available data the classification criteria are not met.

Reproductive toxicity - development Based on available data the classification criteria are not met.

Specific target organ toxicity - single exposure
STOT - single exposure Not classified as a specific target organ toxicant after a single exposure.

Specific target organ toxicity - repeated exposure
STOT - repeated exposure Not classified as a specific target organ toxicant after repeated exposure.

Aspiration hazard



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Aspiration hazard	Not relevant. Gas.
General information	The severity of the symptoms described will vary dependent on the concentration and the length of exposure.
Inhalation	May cause respiratory irritation.
Ingestion	Due to the physical nature of this product, it is unlikely that ingestion will occur.
Skin contact	No specific symptoms known.
Eye contact	No specific symptoms known.
Route of exposure	Inhalation Skin and/or eye contact
Target organs	No specific target organs known.

11.2. Information on other hazards

Information on other hazards This product does not contain any known or suspected endocrine disruptors.

Toxicological information on ingredients.

Isobutane

Acute toxicity - inhalation

Notes (inhalation LC₅₀) 15 min, 570000 ppm, Inhalation, Rat

Butane

Acute toxicity - inhalation

Notes (inhalation LC₅₀) 15 min, >800000 ppm, Inhalation, Rat

Germ cell mutagenicity

Genotoxicity - in vitro

Bacterial reverse mutation test, (OECD 471): Negative.
In vitro chromosomal aberration test., (OECD 473): Negative.

Genotoxicity - in vivo

Mammalian Erythrocyte Micronucleus Test, (OECD Guideline 474), Rat: Negative. Based on the test results of similar product.

Repeated dose toxicity

Species: Rat, NOEL: >9000 ppm, Method of administration: Inhalation (gas), Exposure time: 6 Weeks (OECD 422)

propane

Acute toxicity - inhalation

Notes (inhalation LC₅₀) 15 min, >800000 ppm, Inhalation, Rat

SECTION 12: Ecological information

Ecotoxicity Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.



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12.1. Toxicity

Toxicity Based on available data the classification criteria are not met.

Acute aquatic toxicity

Acute toxicity - fish LC₅₀, 96 hour: 24,11-147,54 mg/l,

Acute toxicity - aquatic invertebrates EC₅₀, 48 hour: 14,22-69,43 mg/l,

Acute toxicity - aquatic plants ErC₅₀, : 7,71-19,37 mg/l, Algae

Ecological information on ingredients.

Isobutane

Acute aquatic toxicity

Acute toxicity - fish LC₅₀, 96 hour: 24,11 mg/l,

Acute toxicity - aquatic invertebrates EC₅₀, 48 hour: 14,22 mg/l, Daphnia magna (Water flea)

Acute toxicity - aquatic plants EC₅₀, 72 hour: 7,71 mg/l, Algae

12.2. Persistence and degradability

Persistence and degradability The degradability of the product is not known.

Ecological information on ingredients.

Butane

Persistence and degradability The substance is readily biodegradable. Based on the test results of similar product.

12.3. Bioaccumulative potential

Bioaccumulative potential No data available on bioaccumulation.

Partition coefficient No information available.

Ecological information on ingredients.

Butane

Partition coefficient log Pow: 2.89

propane

Bioaccumulative potential log Pow: 2,89,

12.4. Mobility in soil

Mobility Not relevant.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.



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12.6. Endocrine disrupting properties

Endocrine disrupting properties The product does not contain any endocrine disrupting substance.

12.7. Other adverse effects

Other adverse effects None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information

The generation of waste should be minimised or avoided wherever possible. Reuse or recycle products wherever possible. This material and its container must be disposed of in a safe way. Disposal of this product, process solutions, residues and by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any local authority requirements. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Empty containers or liners may retain some product residues and hence be potentially hazardous.

Disposal methods

Do not empty into drains. Dispose of surplus products and those that cannot be recycled via a licensed waste disposal contractor. Waste, residues, empty containers, discarded work clothes and contaminated cleaning materials should be collected in designated containers, labelled with their contents. Waste packaging should be collected for reuse or recycling. Incineration or landfill should only be considered when recycling is not feasible.

SECTION 14: Transport information

14.1. UN number or ID number

UN No. (ADR/RID)	1969
UN No. (IMDG)	1969
UN No. (ICAO)	1969
UN No. (ADN)	1969

14.2. UN proper shipping name

Proper shipping name (ADR/RID)	ISOBUTANE
Proper shipping name (IMDG)	ISOBUTANE
Proper shipping name (ICAO)	ISOBUTANE
Proper shipping name (ADN)	ISOBUTANE

14.3. Transport hazard class(es)

ADR/RID class	2.1
ADR/RID classification code	2F
ADR/RID label	2.1
IMDG class	2.1
ICAO class/division	2.1
ADN class	2.1



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Transport labels



14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

No.

14.6. Special precautions for user

EmS	F-D, S-U
ADR transport category	2
Emergency Action Code	2YE
Hazard Identification Number (ADR/RID)	23
Tunnel restriction code	(B/D)

14.7. Maritime transport in bulk according to IMO instruments

Maritime transport in bulk according to IMO instruments Not applicable.

SECTION 15: Regulatory information

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

National regulations	Health and Safety at Work etc. Act 1974 (as amended). The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009 No. 1348) (as amended) ["CDG 2009"]. EH40/2005 Workplace exposure limits.
EU legislation	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 (as amended). Commission Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Commission Regulation (EU) 2020/878 amending Annex II to Regulation (EC) No 1907/2006 (REACH).
Authorisations (SI 2020 No. 1577 Annex XIV) and REACH 1907/2006, Annex XIV	No specific authorisations are known for this product.
Restrictions (SI 2020 No. 1577 Annex XVII) and REACH 1907/2006, Annex XVII	No specific restrictions on use are known for this product.



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Seveso Directive - Control of major accident hazards P2 Lower-tier 10 tonnes Upper-tier 50 tonnes.

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet	ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road. ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways. RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail. IATA: International Air Transport Association. ICAO: Technical Instructions for the Safe Transport of Dangerous Goods by Air. IMDG: International Maritime Dangerous Goods. CAS: Chemical Abstracts Service. ATE: Acute Toxicity Estimate. LC50: Lethal Concentration to 50 % of a test population. LD50: Lethal Dose to 50% of a test population (Median Lethal Dose). EC ₅₀ : 50% of maximal Effective Concentration. PBT: Persistent, Bioaccumulative and Toxic substance. vPvB: Very Persistent and Very Bioaccumulative.
Classification abbreviations and acronyms	Press. Gas (Liq.) = Gas under pressure: Liquefied gas
Key literature references and sources for data	Source: European Chemicals Agency, http://echa.europa.eu/
Classification procedures according to SI 2019 No. 720	Press. Gas (Liq.) - H280, Flam. Gas 1 - H220: : Expert judgement., On basis of test data.
Training advice	Read and follow manufacturer's recommendations. Only trained personnel should use this material.
Issued by	Büşra TARAKCI / CRAD gbf@crad.com.tr Tel+90 216 3354600
Note to organizer	The certificate information is used exclusively for this SDS. No changes can be made to this SDS without the knowledge and approval of the certificate holder or the certificate information can not be used for another SDS. Otherwise, the certificate will assume no responsibility for the owner SDS.
Revision date	21/03/2023
Revision	1.2
Supersedes date	06/02/2018
SDS number	7877
Hazard statements in full	H220 Extremely flammable gas. H280 Contains gas under pressure; may explode if heated.