

AIR LIQUIDE	SAFETY DATA SHEET	Page 1
		Revised version no.: 0
		Date: 31 May 2012
		Replaces: 0/0/0
ISOBUTYLENE		ALDK-076

F+ - Extremely flammable
 2,1 - flammable gases
 Hazard

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

1.1 Product identifier

Trade name : ISOBYTELENE
 Safety Data Sheet no. : ALDK-076
 Name of chemical : isobytelene
 CAS No. :115-11-7
 EC number: 204-066-3
 Index no. :601-012-00-4
 Registration number :. The registration deadline has not expired.
 Chemical formula : C₄H₈ / CH₂=C(CH₃)₂

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

Relevant identified uses :Industrial and professional. Perform risk assessment prior to use.
 Test gas/Calibration gas. Laboratory use. Chemical reaction/Synthesis. Contact the supplier for multiple areas of application.

1.3 Details of the supplier of the safety data sheet

Company identification : Air Liquide Danmark A/S
 Høje Taastrupvej 42, Tel. +45 76 25 25 25
 2630 Taastrup DENMARK
 E-Mail (competent person) : info@airliquide.dk

1.4 Emergency telephone number

Emergency telephone number :112

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

Hazard class and category code regulation EC 1272/2008 (CLP)

- Physical risks : Flammable gases - Category 1 - Hazard - (CLP : Flam. Gas 1) - H220
 Gases under pressure – Liquefied gases - Warning - (CLP : Press. Gas) - H280

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

2.2 Label elements

Labelling regulation EC 1272/2008 (CLP)

- Hazard pictograms

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AIR LIQUIDE	SAFETY DATA SHEET	Page 2
		Revised version no.: 0
		Date: 31 May 2012
		Replaces: 0/0/0
ISOBUTYLENE		ALDK-076

SECTION 2. Hazards identification /...

- Hazard pictograms : GHS02 - GHS04
- Signal words : Hazard
- Risk phrases : 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.
- Reaction : 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

Labelling EC 67/548 or EC 1999/45

- Symbol(s) : F+ : Extremely flammable
- R phrase(s) : R12: Extremely flammable
- S phrase(s) : S9 : Keep container in a well-ventilated place.
S16 : Keep away from sources of ignition – No smoking.
S33 : Take precautionary measures against static discharges.

2.3. Other hazards

: None.

SECTION 3. Composition/information on ingredients

3.1. Substance/mixture

Substance

Ingredients	Content	CAS No.	EC no.	Index no.	Classification
Isobutylene	100%	115-11-7	204-066-3	*2	601-012-00-4

Does not contain any harmful substances or contaminants.

* 1: Included in Appendix IV / V REACH, exempt from registration.

* 2: The registration deadline has not expired.

* 3: Registration is not required. Imported or produced < 1 tonne/year

For the full text of R phrases, please see section 16. For the full text of H statements, please see section 16.

SECTION 4. First aid measures

4.1 Description of first aid measures

- Inhalation : Use a breathing apparatus and move the injured person to a non-polluted area. Keep the injured person warm and calm. Call a doctor. Give artificial respiration in case of stopped breathing.
- Skin contact : In case of a spilled liquid – rinse with water for at least 15 minutes.

- Eye contact : Flush the eyes immediately with water for at least 15 minutes.
- Ingestion : Ingestion is irrelevant

4.2 Most important symptoms and effects, both acute and delayed

: High concentrations can cause choking. The symptoms include possible loss of mobility/awareness without the victim noticing it.

Low concentrations are sedating. The symptoms often include dizziness, headache, nausea and insufficient coordination.

Air Liquide Danmark A/S
Høje Taastrupvej 42, Tel. +45 76 25 25 25 2630 Taastrup DENMARK

AIR LIQUIDE	SAFETY DATA SHEET	Page 3
		Revised version no.: 0
		Date: 31 May 2012
		Replaces: 0/0/0
ISOBUTYLENE		ALDK-076

SECTION 4. First aid measures /...

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

: None.

SECTION 5. Firefighting measures

5.1 Extinguishing media

Extinguishing media

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

5.2 Special hazards arising from the substance or mixture

Special hazards : If the bottlers are exposed to fire, they can explode.

Hazardous combustion products

: Incomplete combustion can generate carbon monoxide.

5.3 Advice for firefighters

Special precautions : Shut off the gas, if possible.

Coordinates fire-fighting measures as regards the fire. Cool down the containers in the fire zone with the help of a water jet from a secure position. Do not allow contaminated water to enter the drain.

Burning gas leakage shall be extinguished in emergencies considering the risk of a gas explosion. Extinguish all other fires.

Special protective equipment : Use a respirator in closed rooms.
for firefighters

SECTION 6. Accidental release measure

6.1 Personal precautions, protective equipment and emergency procedures

: Evacuate the area Try to stop the leakage.

Be aware of the risk for an explosive atmosphere.

Use a respirator at entry unless it has been established that the air is harmless. Ensure sufficient ventilation. Remove any sources of ignition.

Block the access to sewers, basements, pits etc. where hazardous accumulation is possible.

6.2 Environmental precautions

: Try to stop the leakage.

6.3 Methods and material for containment and cleaning up

: Ventilate the area.

6.4 Reference to other sections

: See also sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Safe use of the product : Only experienced personnel with relevant training should handle compressed gases.
The product shall be handled according to the approved sanitary and safety procedures.
Only well-defined materials suitable for the product shall be used at this pressure and temperature. Contact the supplier when in doubt.
Take precautionary measures against static discharges.
Flush the system free from air before supplying with gas.
Keep away from ignition sources, including electrostatic discharges.
Avoid smoking during the procedure.
Consider the hazard of an explosive atmosphere and possible need for explosion-proof equipment.

Air Liquide Danmark A/S
Høje Taastrupvej 42, Tel. +45 76 25 25 25 2630 Taastrup DENMARK

AIR LIQUIDE	SAFETY DATA SHEET	Page 4
		Revised version no.: 0
		Date: 31 May 2012
		Replaces: 0/0/0
ISOBUTYLENE		ALDK-076

SECTION 7. Handling and storage /...

Consider whether non-sparking tools shall be used.
Make sure that the entire gas facility is checked for leakages prior to use or that it is inspected at regular intervals.
Avoid reflux of water, acids or bases.

Safe handling of the gas container

: Refer to the supplier's bottle handling instructions.
Avoid return flow to the bottle.
Protect the gas bottles against physical damage; the bottles may not be dragged, rolled, slid or overturned. Use suitable voltage to transport the gas bottles even over short distances. Leave the valve cap on until the gas bottle is properly secured against overturning to a wall or worktable, and is ready for use.
If the user experiences problems with the handling of the bottle valve, discontinue use and contact the supplier.
Never try to repair or modify the container valves or the safety blow-off

devices by yourself.

The supplier shall be informed about any damaged valves immediately.
Keep the container valves clean and free from contaminants, especially oil and water.

As soon as the container is disconnected, place back the safety cap, if supplied.

Close the container valve after each use and when it is empty, even if the container is still connected to equipment.

Never try to transfer gases from one bottle/container to another. Never use open fire or electrical heating to increase the pressure in a gas container*.

Labels and marking which the gas supplier has put on the gas bottle to identify its content shall not be removed.

7.2 Conditions for safe storage, including any incompatibilities

: Store separately from oxidising gases and substances. Take into account the relevant laws and local regulations on storing containers.
Keep the bottle temperature below 50°C and store the bottles in a well-ventilated area. The containers should be placed standing and properly secured against overturning. Inspect the stored containers regularly for leakages as well as their general condition. Valve caps and covering should be installed. The containers shall be stored in areas with no fire hazard and at a proper distance from heat and ignition sources. Keep away from flammable substances. All electrical equipment in the storage area shall be adapted to the risk of explosive atmosphere. Containers should not be stored under conditions that can cause corrosion.

7.3 Special end uses

: None.

SECTION 8. Exposure controls/personal protection

8.1 Control parameters

DNEL Derived no-effect level [ppm]

: Not Available

PNEC predicted no-effect concentration

: Not available [ppm]

8.2 Exposure controls

8.2.1 Appropriate engineering controls

: Pressurised systems should be inspected for leakage at regular intervals.
Gas sensors should be used when there is a possibility for flammable gas leakage.

It shall be ensured that the exposure is below the limit values set by the Danish Working Environment Authority.

Make sure that the room has sufficient ventilation and local exhaust.

Consider whether it is necessary to use a work permit system in connection with, for example, maintenance works.

Personal protective equipment

: A risk assessment shall be run and documented in each work area in order

to assess the risks associated with the use of the product and in order to choose protective gear that matches the relevant risk. The following recommendations have to be considered:
 Leather gloves when handling pressurised bottles.
 Use safety goggles when filling and opening connections.
 Consider the use of flame-retardant, antistatic work clothes.

Air Liquide Danmark A/S
 Høje Taastrupvej 42, Tel. +45 76 25 25 25 2630 Taastrup DENMARK

AIR LIQUIDE	SAFETY DATA SHEET	Page 5
		Revised version no.: 0
		Date: 31 May 2012
		Replaces: 0/0/0
ISOBUTYLENE		ALDK-076

SECTION 8. Exposure controls/personal protection /...

8.2.3. Environmental

Exposure controls : Refer to local regulations and restrictions relating to discharge into the atmosphere. See section 13 on special methods for handling residual gas.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

- Physical state at 20°C /101.3kPa : Gas
 - Colour : Colourless
 Odour : Sweetish Poor warning properties at low concentration.
 Odour threshold : The odour limit is subjective and insufficient to ward about overexposure.
 Melting point [°C] : -140.3
 Initial boiling point [°C] : -7.1
 Flash point [°C] : Not relevant for gases and gas mixtures
 Evaporation rate (ether=1) : Not relevant for gases and gas mixtures
 Explosive limits : 1.6 to 10
 Vapour pressure [20°C] : 2.6 bar
 Relative density, gaseous (air : 2 =1)
 Relative density, liquid (water=1) : 0.63
 Solubility in water [mg/l] : 388
 Partition coefficient n-octanol/water : 2.35
 Ignition temperature [°C] : 465

9.2 Other information

Other data : The vapours are heavier than air and can accumulate in low or demarcated areas.
 Mass density [g/mol] : 56
 Critical temperature [°C] : 145

SECTION 10. Stability and reactivity

10.1 Reactivity

: No hazard for the reactivity other than what has been described in the items below.

10.2 Chemical stability : Stable under normal conditions.

10.3 Possibility of hazardous reactions

Possibility of hazardous

Reactions : Forms explosive mixtures with air.
Reacts violently with oxidising agents;

10.4 Conditions to avoid

Conditions to avoid : Keep away from heat/sparks/open fire/hot surfaces No smoking.

10.5 Incompatible materials

: Air, oxidation agent.
For additional information regarding compatibility, please see ISO 11114.

10.6 Hazardous decomposition products

: There should be no hazardous decomposition products in case of normal storage and use.

Air Liquide Danmark A/S
Høje Taastrupvej 42, Tel. +45 76 25 25 25 2630 Taastrup DENMARK

AIR LIQUIDE	SAFETY DATA SHEET	Page 6
		Revised version no.: 0
		Date: 31 May 2012
		Replaces: 0/0/0
ISOBUTYLENE		ALDK-076

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity : The product has not caused any known poisoning cases.

Skin corrosion/irritation : No known effects from this product.

Serious eye damage/irritation : No known effects from this product.

Respiratory or skin sensitisation : No known effects from this product.

Carcinogenicity : No known effects from this product.

Mutagenicity : No known effects from this product.

Reproductive toxicity : No known effects from this product.

Single STOT exposure : No known effects from this product.

Repeated STOT exposures : No known effects from this product.

Aspiration hazard : Not relevant for gases and gas mixtures

SECTION 12. Ecological information

12.1 Toxicity

: No available data.

Persistence - degradability

: No available data.

12.3 Bioaccumulative potential

: No available data.

12.4 Mobility in soil

: No available data.

12.5 Results of PBT and vPvB assessment

: Not classified as PBT or vPvB.

12.6 Other adverse effects

Effect on the ozone layer : None.

Effect on the global warming : No known effects from this product.

SECTION 13. Disposal considerations

13.1 Waste treatment methods

Do not blow off in places with a risk for formation of explosive mixtures with the air. Residual gas should go through a suitable burner with a flame trap. Do not divert to places where accumulation can be hazardous. Cf. the EIGA document (Doc 30/10 "Disposal of Gases, downloadable at <http://www.eiga.org>) for more instructions relating to appropriate disposal.

13.2 Other information

: None

Air Liquide Danmark A/S
Høje Taastrupvej 42, Tel. +45 76 25 25 25 2630 Taastrup DENMARK

AIR LIQUIDE	SAFETY DATA SHEET	Page 7
		Revised version no.: 0
		Date: 31 May 2012
		Replaces: 0/0/0
ISOBUTYLENE		ALDK-076

SECTION 14. Transport information

UN number : 1055
ADR, IMDG, IATA labelling

: 2.1 : Flammable gases

Land transport (ADR/RID)

Hazard number : 23

UN proper shipping name : ISOBUTYLENE

Transport class(es) : 2

Classification code : 2 F

Packing Instruction(s) : P200

Tunnel Restriction : Driving through category B and C tunnels is not allowed for tank transport. Driving through category D and E tunnels is not allowed.

Environmental hazards : None.

Sea transport (IMDG)

Kommenterede [H1]: Different designations in the source text, please check

Proper shipping name : **ISOBUTYLENE**
 Class : 2.1
 Emergency Schedule (EmS)
 - Fire : F-D
 Emergency Schedule (EmS)
 - Spillage : S-U
 Packing instruction : P200

Air transport (ICAO-TI / IATA-DGR)

Proper shipping name (IATA) : ISOBUTYLENE
 Class : 2.1
 Passenger and Cargo Aircraft : DO NOT LOAD IN PASSENGER AIRCRAFT.
 Cargo Aircraft only : Allowed.
 Packing instruction
 - Cargo Aircraft : 200 only

Special precautions for the user

: Avoid transportation by vehicles where the truck bed is not separated from the driver's cabin. Make sure the driver is familiar with the risk the load involves and with the measures that must be taken in the event of an emergency or an accident. Before transportation:
 - Make sure the containers are properly fastened.
 - The bottle valve must be closed and sealed.
 - Where applicable, whether a muff or plug is properly installed.
 - Where applicable, whether a cap is properly installed.
 - Ensure sufficient ventilation.

Air Liquide Danmark A/S
 Høje Taastrupvej 42, Tel. +45 76 25 25 2630 Taastrup DENMARK

AIR LIQUIDE	SAFETY DATA SHEET	Page 8
		Revised version no.: 0
		Date: 31 May 2012
		Replaces: 0/0/0
ISOBUTYLENE		ALDK-076

SECTION 15. Regulatory information

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

EU legislation

Service Limitations : None.
 Seveso regulation 96/82/EC : Included
 Compliance with all national/local regulations.

15.2 Chemical safety assessment

: A CSA (Chemical Safety Assessment) has been prepared. Refer to section 8.2.

SECTION 16. Other information

Indication of changes : Revised safety data sheet in compliance with Commission Regulation

453/2010

Advice on training : Make sure the operator understands the risk of fire;
The suffocation hazard, which is often overlooked, shall be strongly stressed to the operator during the training.

Full-text list of the R phrases in section 3 : R12: Extremely flammable

Full-text list of : H220 – Extremely flammable gas.

safety statements in section 3 H280 - Contains gas under pressure, may explode if heated.

note : This safety data sheet has been prepared in compliance with current European legislation.

DISCLAIMER : The user bears the sole responsibility for any accidents or consequences associated with the use of this information.

The information in this guide is based on careful preliminary work and is updated according to the best professional knowledge at the time of printing. Before using the product for trials or new processes, a compatibility and risk analysis has to be performed.

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