

Specialist

Material Safety Data Sheet

(based on regulations (EC) 1272/2008 and (EU) 453/2010)

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

1.1 Butane – propane mix

ITEM	GAS		
Gas cartridge of 190gr content	BUTANE	PROPANE	
SPECIALIST+ 68-004 190 g.	X		FH158

1.2 Relevant identified uses of the substance or mixture

- 1.2.1 Description /use : Receptacles , small containing gas cartridges non-refillable.
Cartridge of fuel gas for welding and recharge of portable ,
professional and home equipment

2 Composition / information of ingredients

2.1 Chemical characteristics C 4 H 10 Butane

CAS-No	EINECS-No	Hazard symbol/R-wording
Propane	74-98-6	200-827-9 F+, R12 S2. 9, 16
Isobutene/n-butane	106-97-8 203-448-7	F+, R12 S2, 9, 16

3 Hazard identification

3.1 Classification of the substance or mixture

The product is classified as hazardous according to directives 67/548/EEC and 1999/45/EC, and CLP .
Regulation CE 1272/2008 (as amended). Therefore an MSDS as per regulation EC 1907/2006, as
amended is required for this product.

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3.1.1 As per CLP Regulation EC 1272/2008, as amended

Hazard classification and indicators:

Flam . Gas 1 H220

Flam . Gas H280

It does not contain 1,3 – butadiene (<0,1%) (therefore Note K of regulation 1272/2008 shall apply)

3.1.2 As per European Directive 67/548/EEC, as amended

Hazard Symbols: F+

R phrases: R12

For the full text of both the risk phrases (R) and the hazard indicators (H), see Section 16.

3.2 Label elements

Pictograms



(Flammable gases : hazard category 1)

Warning

Hazard

Hazard indicators:

H220

Highly flammable gas.

Caution advices:

P102

Keep away from children.

P210

Keep away from sources, sparks, open flames, or heated surfaces

- Do not smoke

P377

In event of fire due to gas leak, do not extinguish unless it is possible to stop the leak safely.

P381

Remove any source of ignition if it is not dangerous.

P403

Store in a well ventilated place.

P410+412

Do not expose to direct sunlight. Do not expose to a temperature exceeding 50° C

The hazard indicators are simplified by virtue of the departure provided for by Annex 1, Section 1.3.2.1 of Regulation EC 1272/2008.

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3.3 Other hazards

Physical hazards:

The accumulation of vapours in confined environments may lead to explosive mixtures with the air, mainly in closed rooms.

Strong heating of the container (e.g in case of fire) causes a significant increase in terms of liquid volume and pressure, with the subsequent danger for the receptacle to explode.

Health and safety hazards for workers:

The liquid gas direct contact on skin or eyes may cause localized freezing of skin or conjunctiva.

The presence or the injection of gas in confined environments may cause asphyxiation. Keep oxygen concentration above 17% (normal value=20.9%)

In default of oxygen, gas combustion too may result incomplete and leading to the formation of carbon monoxide, a toxic gas.

Inhaling the gas as it may lower the activity of the central nervous system thus causing drowsiness and vertigo. In case of prolonged exposure , cardiac sensitization (arrhythmia) may occur .

Hazards for the environment:

Being a volatile organic compound (VOC), the gas is subject to photochemical reactions generating hazardous atmospheric pollutants (ozone, organic nitrates).

4 First aid Measures

4.1 Description of first aid measures

Inhalation: move the injured person away from the hazardous area. In case of asphyxiating atmosphere and should the injured person need any assistance , use the convenient protection equipment . Do not use any object which may cause explosions during rescue operations. Let the injured person breath fresh air and immediately call a doctor. In case of respiratory distress, implement first air procedures. Symptoms related to the absorption of either gases or vapours (drowsiness, blurry vision, possible arrhythmia) may occur delayed. This is why it is necessary to immediately get medical attention as soon as you feel unwell, bringing the product label or the data sheet with you.

Skin contact: in case of contact with the liquid product, dip the frozen part in the water for approximately 5 minutes. Do not use hot water. Do not rub . In case of skin lesions , get medical attention.

Eye contact: in case of contact with the liquid product, immediately wash with water for at least 15 minutes, keeping the eyelid up. Do not use hot water. Do not rub. Get medical attention in case of irritation, altered vision or eyed damages.

Ingestion: this is a fairly unlikely case considering the product volatility. In any case, it may cause severe damages due to the freezing of mucosae and tissues in the mouth, oesophagus, and stomach. If the case may be, do not induce vomiting and immediately get medical attention.

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4.2 Most important symptoms and effects, both acute and delayed

For symptoms and effects due to the substances contained, please refer to Section 11.

4.3 Indication of any immediate medical attention and special treatment needed

Follow the physician's advice.

5 Fire Fighting Measure

5.1 Extinguishing media

Suitable extinguishing media: carbon dioxide, foam, chemical dust

DO NOT USE WATER

5.2 Special hazards arising from the substance or mixture

If involved in fire, the container may explode emitting irritant fumes and toxic gases (carbon oxide) and projecting particles of metal.

5.3 Advice for firefighters

Never extinguish a fire unless you are sure to promptly detect the gas leak or you are sure that the leaking gas is not able to rekindle: it is preferable to have a fire release rather than a cloud of gas expanding toward an ignition source. Call the Fire Brigade if unsure to be able to extinguish the fire in a timely manner using the extinguishing media available.

Please remember that the product, if released, is denser than the air and it tends to stay close to the floor.

Use nebulised water to cool down the containers exposed to fire and to reduce the fire extent.

In case of fire, use an approved self-contained breathing apparatus (EN 137 type), gloves and emergency protective clothes.

6 Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: check for explosions (presence of trigger sources, damaged containers), remove the ignition sources and provide sufficient ventilation to the rooms. Inform people nearby, and those who are downwind in particular, of the gas leak and the subsequent danger of fire and possible explosion. Please remember that the gas is heavier than the air and therefore it tends to stratify on the floor. Implement other procedures as provided for by the emergency plan (if any). If a relevant accident is assumed inform the local authorities.

For emergency responders: wear protective (antistatic) clothes and PPE to prevent inhalation and either skin or eye contact, and follow the emergency procedures (refer to Section 8).

Please remember that the gas is heavier than the air and therefore it tends to stratify on the floor. The gas in the air may generate an explosive atmosphere even with a minimum source of ignition. Containers too, if exposed to heat sources, may explode.

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6.2 Environmental precautions

Curb the leakage, and prevent any liquid residues from getting into the superficial waters and the sewers. Please refer to Sections 12 and 13.

6.3 Methods and material for containment and cleaning up

If the product has not evaporated, clean and collect all residues using absorbing material (sand, sepiolite, cement, sawdust) if necessary. Never use metallic objects for such operations. Leave the contaminated materials outdoors before disposing of the resulting materials. Please refer to Sections 12 and 13.

7 Handling and storage

7.1 Precautions for safe handling

The product may generate explosive atmospheres. Handle the receptacles with care.

Make sure that the workplace or in any case the place where the gas is used is properly ventilated.

Apply the non smoking notice. Do not vaporize/spray the gas on open flames or any other burning item.

Avoid any physical damage to the container (corrosion, tumble, mechanical action).

Check for gas leaks (water and soap solution) far from any ignition source (flames, sparks, ionizing radiations, laser radiations, microwaves, static electricity).

Avoid liquefied and compressed gas splashes coming into contact with eyes or skin. Do not breathe the gas as it is nor as resulting from combustion (use the PPE indicated in Section 8).

Do not eat, drink or smoke while using the product.

7.2 Conditions for safe storage, including any incompatibilities

Keep the gas in its original containers, sealed, and in a cold place far from heat (at a temperature below 50° C), and far from flames and sparks.

The places where fuel gas is stored must be duly ventilated and separated from the deposits of other oxidizing or comburent agents (oxygen, nitrous oxide) as well as from deposits of incompatible substances as per Section 10.

7.3 Specific and uses

End uses other than those indicated in subsection 1.2 are not recommended.

Please refer to technical instructions for a safe use of the product (see Section 16). In particular, read the cartridge insertion instructions carefully before using it.

8 Exposure controls / personal protection

8.1 Control parameters

Avoid exposure to background concentration exceeding:

-1000ppm (v/v) TWA-for aliphatic hydrocarbons C1-C4 (propane, butane, isobutane)-ACGIH, 2010

-800ppm (v/v) TWA-for n-butane and isobutane-NIOSH, 2001

-2100ppm (v/v) IDLH-propane (NIOSH, 2010)

25ppm (v/v) TWA – for carbon oxide (CAS nr.630-08-0)-ACGIH, 2010

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8.2 Exposure controls

8.2.1 Professional exposure control

The following protective equipment is indicated, with specifications by the manufacturer of protective equipment:

- for the respiratory tract: in case of inadequate ventilation, wear a full face mask (EN 136 type) with an organic vapour filter or even better a self-contained breathing apparatus (EN 137 type) with full face mask.
- for the hands: thermal insulating gloves (EN 511 type). Possibility of superficial cooling up to -50°C .
- for the eye: monogoggles (EN 166 type), face shield.
- for the skin: work clothes (EN 340 type).

8.2.2 Environmental exposure control

Always operate in a well stocked area, equipped with ventilation systems and emergency equipment (extinguishers).

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

- | | |
|------------------------------------|---|
| a) Appearance | Pressurized liquid, gas at 15.6°C and 1 bar. Colourless |
| b) Odour | Typical of the odorized fuel gas (non annoying) |
| c) Odour threshold | n-butane : between 2,9 and 14,6 mg/m ³ |
| d) Ph at 20°C | not relevant |
| e) Freezing point | lower than -130°C |
| f) Boiling point | -0.5°C |
| g) Flash point | -74°C |
| h) Evaporation rate | the liquid evaporates quickly in the atmosphere, causing a sharp cooling of contact surfaces |
| i) Flammability | Flammable gas with air (at 20°C and 101.3 kPa) |
| j) Upper/lower flammability Limits | the flammable gas / air mixtures may explode. If the gas is in concentration ranging from the lower explosion limit (LEL) and upper explosion limit (UEL):
n-butane :LEL=1.8% and UEL=8.4%

isobutene: LEL=1.8% and UEL=9.8%
propane:LEL=2.2% and UEL=10% |
| k) Vapour pressure | n-butane: 1820 mmHg at 25°C
Isobutene: 2611 mmHg at 25°C
Propane: 7150 mmHg at 25°C |
| l) Relative vapour density | n-butane and isobutane:2.07 (air=1)
Propane:1.56 (air=1) |

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m) Relative density	n-butane and isobutane : 0.6 (water=1) Propane :0.5 (water=1)
n) Solubility	
Water solubility	n-butane :61.2 mg/l at 25 ° C Isobutane:48.9 mg/L at 25 ° C Propane: 62.4 ppm at 25 ° C
Fat solubility	soluble in either, chloroform
o) Partition coefficient (n-octanol/ water)	Log Kow ranging from 2.36 and 2.89
p) Auto-ignition temperature	405 ° C
q) Decomposition temperature	univocal values not available in scientific literature
r) Viscosity	n-butane : 0.30 cSt at 20 ° C (liquid) Propane: 0.20 cSt at 20 ° C (liquid)
s) Explosive properties	none
t) Critical temperature	n-butane : 153.2 ° C Isobutane: 134.69 ° C Propane:96.81 ° C
u) Critical pressure	butane: 35.7 atm Isobutane: 35.82 atm Propane : 42.01 atm

9.2 Other information

None.

10 Stability and reactivity

10.1 Reactivity

The container explosion or opening due to inadequate storages conditions may immediately generate an explosive atmosphere (refer to Subsection 10.3).

10.2 Stability

The strong heating of containers causes a quick decompression and a subsequent gas leak.
For handling instructions, please refer to Section 7. Also refer to Subsection 10.4.

10.3 Possibility of hazardous reactions

Contact with highly oxidizing agents(hypochlorites, nitrates, perchlorites, permanganates, bichromates) causes a strong reaction, it may strongly react with comburent substances (peroxides, chlorine dioxide, nitrogen dioxide). Also the contact with halogens, chlorine, fluorine, and acetylene may cause strong exothermic reactions. Adding carbonyl nickel to the mixture of n-butane and oxygen may cause explosions at 20-40 ° C.

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10.4 Conditions to avoid

Implement precautionary measures to avoid cylinder exposure to direct sunlight and heat sources. Do not expose to temperatures above 50 °C. Avoid conditions which may cause corrosion and breakage of containers.

10.5 Incompatible materials

Highly oxidizing agents, comburents, halogens, chlorine, fluorine, and acetylene.

10.6 Hazardous decomposition products

Toxic gases (carbon oxide) and highly flammable gases (hydrogen, ethylene) , irritating carbon fumes.

11 Toxicological information

There are no experimental data available concerning the mixture.

11.1 Information on toxicological effects

Acute toxicity:

Inhalation: n-butane-EC50=658mg/1/4h (rats)-information on humans is inconclusive
isobutane-EC50=570000ppm (rats)- information on humans is inconclusive
propane-EC50=280000ppm (rats)- information on humans is inconclusive

Ingestion: data not available (technically impossible to be tested using conventional methods)

Skin/Eye contact: information on humans indicates that this effect is not present.

Irritation:

Inhalation: n-butane- information on humans is inconclusive
isobutane- information on humans is inconclusive
propane- irritations with concentrations of 100,000 ppm-inconclusive data

Ingestion: data not available (technically impossible to be tested using conventional methods)

Skin/Eye contact: information on humans indicates that this effect is not present.

Corrosion:

Information on humans indicates that this effect is not present (but in its liquid phase it causes cold burns)

Sensitisation:

Absence of specific data

Repeated dose toxicity:

Information on humans indicates that this effect is not present

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Carcinogenicity, mutagenicity, and reproductive toxicity:

There are no conclusive results (humans, animals) concerning either carcinogenic or mutagenic effects, nor effects affecting reproduction (teratogenicity, embryotoxicity) for the product components.

Related symptoms:

Inhalation: inhaling vapours containing the product may cause irritation to the mucosae and apnoea.

Absorbing the gas causes a narcotic effect (depression of the central nervous system), so it may lead to vertigo or asphyxiation with no warming symptoms. Effects on lung and heart functionality (arrhythmia, cardiac arrest) may be associated to the highest concentrations (1%-10% in the air).

Skin/Eye contact: if liquid, there is the possibility of freezing with a subsequent lesion of the skin/eye tissue.

Ingestion: the liquid phase determines the immediate freezing and may cause severe damages to both mucosae and tissues in the mouth, oesophagus, and stomach.

12 Ecological information

There are no experimental data available concerning the mixture.

12.1 Toxicity

The product does not contain any substance for which conclusive evidence is present concerning harmful effects to the environment.

12.2 Persistence and degradability

The product does not appear to cause damages to the activated sludge in biological treatment plants. The organic substances contained in the products result to be biodegradable.

12.3 Bioaccumulative potential

The bioconcentration factors (Log BCF ranging from 1.56 and 1.78 calculated for the substances contained) suggest that the bioconcentration is potentially limited. Please note that, also in this case and considering the gas solubility in the water, volatilization in the atmosphere is expected to be a dominant process.

12.4 Mobility in soil

The product diffuses in soil, water, and air.

12.5 Results of PBT and vPvB assessment

Information not available.

12.6 Other adverse effects

Emitting hydrocarbons and organic solvents in the atmosphere contributes to the photochemical creation of ozone, a hazardous gas at atmospheric level, and to the creation of organic nitrates.

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13 Disposal consideration

13.1 **Waste treatment methods**

The product makes hazardous all wastes which contain residuals of it due to flammability and possible creation of explosive atmospheres.

Avoid compression or in any case damages to containers. As for the wastes, implement the same safety regulations provided for the product itself, in particular do not pierce or burn the container.

The cartridge is of piercing type, it empties completely. Dispose of empty cartridges in the adequate recycling bins.

14 Transport Information

Road and rail transportation ADR/RID (2009):



Class ADR/RID :2

Classification code:5F

UN number: 2037

UN shipping name: Receptacles, small containing gas (gas cartridges) without a release device. Non refillable.

Hazard label :2.1

Packaging group: -

Description of goods: Non –reusable cartridge containing pressurized gas.

Exemptions related to quantities carried per transport unit (1.1.3.6 ADR 2011) = category 2 = 333kg

Limited quantities (3.4 ADR 2011)= 1 litre

To take advantage of the exemption related to the limited quantities, the product shall be:

. packed in external package with a gross mass \leq than 30 kg per parcel

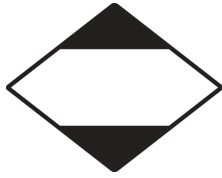
Or

. packed in tray with either shrinking or stretch film with a gross mass \leq than 20 kg per parcel

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The “small receptacles containing gas” (or alternatively the aerosols), whose capacity does not exceed 50ml, are not subject to any other ADR disposition provided that they contain non toxic components only.

Maritime transport IMDG (2008 amdt 34-08):



Class IMDG:2

UN number : 2037

UN shipping name : “Receptacles, small, containing gas (gas cartridges) without a release device, non-Refillable”.

Label : 2.1

Packaging group : -

EMS number : F-D, S-U

Marine pollutant : No

Description of goods: Non-reusable cartridge containing pressurized gas.

Air transport ICAO/IATA (2009):



Class ICAO/IATA : 2.1

UN number : 2037

UN shipping name : “Receptacles, small, containing gas (gas cartridges) without a release device, non-Refillable”.

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Label : 2.1

Packaging group : -

Description of goods: Non-reusable cartridge containing pressurized gas.

Pkg inst: Y203 (Ltd Qty)

Pkg inst: 203

ERG : 10L

EQ : E0

15 Regulatory Information

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

Risk of relevant accident: product included in Annex 1, part 2 of Greek Legislative Decree 334/99 due to its flammable properties. Without prejudice to the provisions and the exclusions of the above mentioned regulation, for storages exceeding the quantities indicated in that annex, phase refer to article 6,7 or 8 of the above mentioned regulation.

Restrictions on placing on the market and use: no restrictions based on Annex XVII to the regulation EC 1907/2006 (REACH), as amended.

Substances in Candidate List (Art.59 REACH) : none

Substances subject to authorization (Annex XIV REACH): none

15.2 Chemical safety assessment

A chemical safety assessment has not been elaborated for this substance

16 Other information

Text of the hazard indicators (H) mentioned in Sections 2 and 3 of this data sheet.

Flam. Gas 1-Flammable gas, cat . 1

Press.Gas-Pressurized gas

H220-Highly flammable gas

H280-It contains pressurized gas: it may explode when heated

Text of the risk phrases (R) mentioned in Sections 2 and 3 of this data sheet

F+ - Extremely flammable

R12 – Extremely flammable

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Indications concerning this revised version

Each section of this data sheet has been revised due to the updating of the regulation and the information concerning safety and health of workers and environment in particular :

- classification and labelling have been revised to comply with Regulation EC 1272/2008
- form and substance required for Safety Data Sheets have been revised in accordance with changes to Regulation EC 1907/2006 occurred when the Regulation EU 453/2010 came into effect. This Data Sheet has been written in accordance with the indications provided for by Annex I of the previously mentioned Regulation.

Notes for users

The information provided in this Data Sheet are based on our present knowledge about safety, health and environment. It aims at enabling the professional user of the product to indentify both preventive and protective measures for safe operations.

The user of the product, prior to use the product for purposes different from the ones indicated, shall verify whether further information is needed, provided the relevant legislation and the operational good practice. No liability is accepted for any improper or incorrect usage of the product.

The features mentioned shall not be considered as warranty of specific properties of the product. Always present either the label or the Data Sheet of the product when consulting a physician.

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