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

1.1. Product identifier

Product form	: Substance
Trade name	: ISOBUTANE
Chemical name	: Isobutane
EC Index	: 601-004-00-0
EC-No.	: 200-857-2
CAS-No.	: 75-28-5
REACH registration No	: 01-2119485395-27-0023
Product group	: Trade product

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

1.2.1. Relevant identified uses

Main use category	: Industrial use, Professional use
Use of the substance/mixture	: Fuels Propellant Blowing agent monomer Formulation Distribution

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Supplier

NIS a.d. Novi Sad
Narodnog Fronta 12
21000 Novi Sad - Serbia
T + 381 (0) 21 481 1111
Dragana.Cvetkov@nis.eu (REACH)

Only Representative

BENS Consulting d.o.o.
Špruha 19
1236 Trzin - Slovenija
T +386 41 979 800
info@bens-consulting.eu

1.4. Emergency telephone number

Emergency number	: + 381 (0) 21 481 1111 Only available during office hours.
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Country	Official advisory body	Address	Emergency number
Ireland	National Poisons Information Centre Beaumont Hospital	PO Box 1297 Beaumont Road 9 Dublin	+353 1 809 2566 (Healthcare professionals-24/7) +353 1 809 2166 (public, 8am - 10pm, 7/7)


SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flam. Gas 1A H220
Press. Gas (Liq.) H280

Full text of H- and EUH-statements: see section 16

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2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



Signal word :

Danger

Hazard statements (CLP) :

H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.

Precautionary statements (CLP) :

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - In case of leakage, eliminate all ignition sources.
P403 - Store in a well-ventilated place.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.

Listed in Annex VI :

EC Index-No.: 601-004-00-0

2.3. Other hazards

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

Contains no PBT/vPvB substances $\geq 0.1\%$ assessed in accordance with REACH Annex XIII

The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605


SECTION 3: Composition/information on ingredients

3.1. Substances

Substance name : isobutane
CAS-No. : 75-28-5
EC-No. : 200-857-2
EC Index : 601-004-00-0

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
isobutane	(CAS-No.) 75-28-5 (EC-No.) 200-857-2 (EC Index) 601-004-00-0	≥ 97	Flam. Gas 1A, H220 Press. Gas (Comp.), H280
propane	(CAS-No.) 74-98-6 (EC-No.) 200-827-9 (EC Index) 601-003-00-5	$\leq 1,5$	Flam. Gas 1, H220 Press. Gas
butane	(CAS-No.) 106-97-8 (EC-No.) 203-448-7 (EC Index) 601-004-00-0	$\leq 1,5$	Flam. Gas 1A, H220 Press. Gas (Liq.), H280

Full text of H- and EUH-statements: see section 16

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3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

Additional advice	: First aider: Pay attention to self-protection!. Concerning personal protective equipment to use, see section 8. Never give anything by mouth to an unconscious person. In case of doubt or persistent symptoms, consult always a physician. Show this safety data sheet to the doctor in attendance.
Inhalation	: Remove casualty to fresh air and keep warm and at rest. Give oxygen or artificial respiration if necessary. In case of doubt or persistent symptoms, consult always a physician.
Skin contact	: Remove contaminated clothing and shoes. Gently wash with plenty of soap and water. Wash contaminated clothing before reuse. In case of frostbite, wash with plenty of water; do not remove clothing. In case of doubt or persistent symptoms, consult always a physician.
Eyes contact	: Rinse immediately carefully and thoroughly with eye-bath or water. Remove contact lenses, if present and easy to do. Continue rinsing. In case of doubt or persistent symptoms, consult always a physician.
Ingestion	: Rinse mouth immediately and drink plenty of water. Get medical advice/attention.

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

Inhalation	: May be irritating.
Skin contact	: Can cause frostbite.
Eyes contact	: Causes frostbite burns to eyes.
Ingestion	: Ingestion is not considered a potential route of exposure.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media


Suitable extinguishing media	: carbon dioxide (CO ₂), powder, alcohol-resistant foam, water spray.
Unsuitable extinguishing media	: Strong water jet.

5.2. Special hazards arising from the substance or mixture

Specific hazards	: Extremely flammable gas. Contains gas under pressure; may explode if heated. Vapours may form explosive mixture with air. Vapours are heavier than air and may spread along floors. Vapours are heavier than air and may travel considerable distance to an ignition source and flash back to source of vapours. Container may explode if heated.
Hazardous decomposition products in case of fire	: Carbon oxides (CO, CO ₂).

5.3. Advice for firefighters

Firefighting instructions	: Evacuate area. Use water spray or fog for cooling exposed containers. Contain the extinguishing fluids by bunding. Prevent fire fighting water from entering the environment.
Protection during firefighting	: Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus.
Other information	: Do not allow run-off from fire-fighting to enter drains or water courses. Dispose of waste in accordance with environmental legislation.

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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

For non-emergency personnel : Evacuate unnecessary personnel. Keep upwind. Provide adequate ventilation. Do not breathe gas. Avoid contact with skin, eyes and clothing. Wear recommended personal protective equipment. Concerning personal protective equipment to use, see section 8. Keep away from heat and direct sunlight. Use explosion-proof equipment. Ensure equipment is adequately earthed. Use only non-sparking tools.

6.1.2. For emergency responders

For emergency responders : Ensure procedures and training for emergency decontamination and disposal are in place. Concerning personal protective equipment to use, see section 8.

6.2. Environmental precautions

Do not allow to enter into surface water or drains. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Stop leak if safe to do so. Leave evaporate and disperse. Hose down gases, fumes and/or dust with water. All processes must be supervised by specialists or authorised personnel. This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

Concerning personal protective equipment to use, see section 8. Concerning disposal elimination after cleaning, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Extremely cold liquid and gas under pressure. Causes severe frostbite. Provide adequate ventilation. Do not breathe gas. Avoid contact with skin, eyes and clothing. Use personal protective equipment as required. Concerning personal protective equipment to use, see section 8. Take any precaution to avoid mixing with Incompatible materials, Refer to Section 10 on Incompatible Materials. Ensure proper process control to avoid excess waste discharge (temperature, concentration, pH, time). Avoid release to the environment. Keep away from heat and direct sunlight. Use explosion-proof equipment. Ensure equipment is adequately earthed. Keep container tight closed.

Hygiene measures : Keep good industrial hygiene. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Do not eat, drink or smoke when using this product. Keep away from food, drink and animal feedingstuffs. Remove contaminated clothes. Separate working clothes from town clothes. Launder separately. Wash contaminated clothing before reuse.


7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a dry, cool and well-ventilated place. Do not store near or with any of the incompatible materials listed in section 10.

Heat and ignition sources : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Protect from sunlight.

Special rules on packaging : Containers which are opened should be properly resealed and kept upright to prevent leakage.

Packaging materials : Keep only in the original container. Suitable material: Mild steel.

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7.3. Specific end use(s)

see section(s) : 1.2.


SECTION 8: Exposure controls/personal protection

8.1. Control parameters


Isobutane (75-28-5)		
Austria	MAK (OEL TWA)	1900 mg/m ³ (Butane (all isomers))
Austria	MAK (OEL TWA) [ppm]	800 ppm (Butane (all isomers))
Austria	MAK (OEL STEL)	3800 mg/m ³ (Butane both isomers)
Austria	MAK (OEL STEL) [ppm]	1600 ppm (Butane both isomers)
Estonia	OEL TWA	1900 mg/m ³
Estonia	OEL TWA [ppm]	800 ppm
Finland	HTP (OEL TWA) [1]	1900 mg/m ³ (suffocating gas that displaces oxygen (Butane))
Finland	HTP (OEL TWA) [2]	800 ppm (suffocating gas that displaces oxygen (Butane))
Finland	HTP (OEL STEL)	2400 mg/m ³ (Butane)
Finland	HTP (OEL STEL) [ppm]	1000 ppm (Butane)
Germany	Occupational exposure limit value (mg/m ³) (TRGS900)	2400 mg/m ³
Germany	Occupational exposure limit value (ppm) (TRGS900)	1000 ppm
Slovenia	OEL TWA	2400 mg/m ³
Slovenia	OEL TWA [ppm]	1000 ppm
Slovenia	OEL STEL	9600 mg/m ³
Slovenia	OEL STEL [ppm]	4000 ppm
Switzerland	MAK (OEL TWA) [1]	1900 mg/m ³ (including Butane (all isomers))
Switzerland	MAK (OEL TWA) [2]	800 ppm (including Butane (all isomers))
Switzerland	KZGW (OEL STEL)	7600 mg/m ³ (Butane)
Switzerland	KZGW (OEL STEL) [ppm]	3200 ppm (Butane)
USA - ACGIH	ACGIH OEL STEL [ppm]	1000 ppm (explosion hazard (Butane, isomers))
USA - NIOSH	NIOSH REL TWA	1900 mg/m ³
USA - NIOSH	NIOSH REL TWA [ppm]	800 ppm
propane (74-98-6)		
Austria	MAK (OEL TWA)	1800 mg/m ³
Austria	MAK (OEL TWA) [ppm]	1000 ppm
Austria	MAK (OEL STEL)	3600 mg/m ³
Austria	MAK (OEL STEL) [ppm]	2000 ppm
Belgium	OEL TWA [ppm]	1000 ppm (gas)
Bulgaria	OEL TWA	1800 mg/m ³
Denmark	OEL TWA [1]	1800 mg/m ³
Denmark	OEL TWA [2]	1000 ppm
Estonia	OEL TWA	1800 mg/m ³

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propane (74-98-6)		
Estonia	OEL TWA [ppm]	1000 ppm
Finland	HTP (OEL TWA) [1]	1500 mg/m ³ (suffocating gas that displaces oxygen)
Finland	HTP (OEL TWA) [2]	800 ppm (suffocating gas that displaces oxygen)
Finland	HTP (OEL STEL)	2000 mg/m ³
Finland	HTP (OEL STEL) [ppm]	1100 ppm
Germany	Occupational exposure limit value (mg/m ³) (TRGS900)	1800 mg/m ³
Germany	Occupational exposure limit value (ppm) (TRGS900)	1000 ppm
Greece	OEL TWA	1800 mg/m ³
Greece	OEL TWA [ppm]	1000 ppm
Ireland	OEL STEL [ppm]	3000 ppm (calculated (Aliphatic hydrocarbon gases - Alkanes (C1-C4)))
Latvia	OEL TWA	1800 mg/m ³
Latvia	OEL TWA [ppm]	1000 ppm
Poland	NDS (OEL TWA)	1800 mg/m ³
Portugal	OEL TWA [ppm]	1000 ppm
Romania	OEL TWA	1400 mg/m ³
Romania	OEL TWA [ppm]	778 ppm
Romania	OEL STEL	1800 mg/m ³
Romania	OEL STEL [ppm]	1000 ppm
Slovenia	OEL TWA	1800 mg/m ³
Slovenia	OEL TWA [ppm]	1000 ppm
Slovenia	OEL STEL	7200 mg/m ³
Slovenia	OEL STEL [ppm]	4000 ppm
Norway	Grenseverdi (OEL TWA) [1]	900 mg/m ³
Norway	Grenseverdi (OEL TWA) [2]	500 ppm
Norway	Korttidsverdi (OEL STEL)	1125 mg/m ³ (value calculated)
Norway	Korttidsverdi (OEL STEL) [ppm]	625 ppm (value calculated)
Switzerland	MAK (OEL TWA) [1]	1800 mg/m ³
Switzerland	MAK (OEL TWA) [2]	1000 ppm
Switzerland	KZGW (OEL STEL)	7200 mg/m ³
Switzerland	KZGW (OEL STEL) [ppm]	4000 ppm
Canada (Quebec)	VEMP (OEL TWA)	1800 mg/m ³
Canada (Quebec)	VEMP (OEL TWA) [ppm]	1000 ppm
USA - IDLH	IDLH [ppm]	2100 ppm (10% LEL)
USA - NIOSH	NIOSH REL TWA	1800 mg/m ³
USA - NIOSH	NIOSH REL TWA [ppm]	1000 ppm
USA - OSHA	OSHA PEL TWA [1]	1800 mg/m ³
USA - OSHA	OSHA PEL TWA [2]	1000 ppm

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butane (106-97-8)		
Austria	MAK (OEL TWA)	1900 mg/m ³ (Butane (all isomers))
Austria	MAK (OEL TWA) [ppm]	800 ppm (Butane (all isomers))
Austria	MAK (OEL STEL)	3800 mg/m ³
Austria	MAK (OEL STEL) [ppm]	1600 ppm
Belgium	OEL STEL	2370 mg/m ³
Belgium	OEL STEL [ppm]	980 ppm
Bulgaria	OEL TWA	1900 mg/m ³
Croatia	GVI (OEL TWA) [1]	1450 mg/m ³ 22 mg/m ³ (containing >=0.1% Butadiene)
Croatia	GVI (OEL TWA) [2]	600 ppm 10 ppm (containing >=0.1% Butadiene)
Croatia	KGVI (OEL STEL)	1810 mg/m ³
Croatia	KGVI (OEL STEL) [ppm]	750 ppm
Denmark	OEL TWA [1]	1200 mg/m ³
Denmark	OEL TWA [2]	500 ppm
Estonia	OEL TWA	1500 mg/m ³
Estonia	OEL TWA [ppm]	800 ppm
Finland	HTP (OEL TWA) [1]	1900 mg/m ³ (suffocating gas that displaces oxygen (Butane))
Finland	HTP (OEL TWA) [2]	800 ppm (suffocating gas that displaces oxygen (Butane))
Finland	HTP (OEL STEL)	2400 mg/m ³
Finland	HTP (OEL STEL) [ppm]	1000 ppm
France	VME (OEL TWA)	1900 mg/m ³
France	VME (OEL TWA) [ppm]	800 ppm
Germany	Occupational exposure limit value (mg/m ³) (TRGS900)	2400 mg/m ³
Germany	Occupational exposure limit value (ppm) (TRGS900)	1000 ppm
Greece	OEL TWA	2350 mg/m ³
Greece	OEL TWA [ppm]	1000 ppm
Hungary	AK (OEL TWA)	2350 mg/m ³
Hungary	CK (OEL STEL)	9400 mg/m ³
Ireland	OEL TWA [2]	1000 ppm (Aliphatic hydrocarbon gases - Alkanes (C1-C4))
Ireland	OEL STEL [ppm]	3000 ppm (calculated)
Latvia	OEL TWA	300 mg/m ³
Poland	NDS (OEL TWA)	1900 mg/m ³
Poland	NDSch (OEL STEL)	3000 mg/m ³
Slovenia	OEL TWA	2400 mg/m ³ (containing >=0.1% Butadiene)
Slovenia	OEL TWA [ppm]	1000 ppm (containing >=0.1% Butadiene)
Slovenia	OEL STEL	9600 mg/m ³ (containing >=0.1% Butadiene)
Slovenia	OEL STEL [ppm]	4000 ppm (containing >=0.1% Butadiene)

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butane (106-97-8)		
United Kingdom	WEL TWA (OEL TWA) [1]	1450 mg/m ³
United Kingdom	WEL TWA (OEL TWA) [2]	600 ppm
United Kingdom	WEL STEL (OEL STEL)	1810 mg/m ³
United Kingdom	WEL STEL (OEL STEL) [ppm]	750 ppm
Norway	Grenseverdi (OEL TWA) [1]	600 mg/m ³ (Referanser (lover/forskrifter): FOR-2011-12-06 nr 1358 Forskrift om tiltaks- og grenseverdier (sist endret gjennom FOR-2016-12-22 nr 1860)).
Norway	Grenseverdi (OEL TWA) [2]	250 ppm (Referanser (lover/forskrifter): FOR-2011-12-06 nr 1358 Forskrift om tiltaks- og grenseverdier (sist endret gjennom FOR-2016-12-22 nr 1860)).
Norway	Korttidsverdi (OEL STEL)	750 mg/m ³ (value calculated)
Norway	Korttidsverdi (OEL STEL) [ppm]	312,5 ppm (value calculated)
Switzerland	MAK (OEL TWA) [1]	1900 mg/m ³ (Butane (all isomers))
Switzerland	MAK (OEL TWA) [2]	800 ppm (Butane (all isomers))
Switzerland	KZGW (OEL STEL)	7600 mg/m ³ (Butane)
Switzerland	KZGW (OEL STEL) [ppm]	3200 ppm (Butane)
Australia	OES TWA [1]	1900 mg/m ³
Australia	OES TWA [2]	800 ppm
Canada (Quebec)	VEMP (OEL TWA)	1900 mg/m ³
Canada (Quebec)	VEMP (OEL TWA) [ppm]	800 ppm
USA - ACGIH	ACGIH OEL STEL [ppm]	1000 ppm (explosion hazard (Butane, isomers))
USA - IDLH	IDLH [ppm]	1600 ppm (>10% LEL)
USA - NIOSH	NIOSH REL TWA	1900 mg/m ³
USA - NIOSH	NIOSH REL TWA [ppm]	800 ppm

DNEL : NA
PNEC : NA
Additional information : Recommended monitoring procedures. Personal monitoring. Concentration measurement in air. Personal air monitoring. Room air monitoring

8.2. Exposure controls

Engineering measure(s) : Closed system. Provide adequate ventilation. Use only in area provided with appropriate exhaust ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Take precautionary measures against static discharge. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Use only explosion-proof equipment. Organisational measures to prevent /limit releases, dispersion and exposure. See Section 7 for information on safe handling.

Personal protective equipment : The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.


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Hand protection	: The selection of specific gloves for a specific application and time of use in a working area, should also take into account other factors on the working space, such as (but not limited to): other chemicals that are possibly used, physical requirements (protection against cutting/drilling, skill, thermal protection), and the instructions/specification of the supplier of gloves. cold insulating gloves (EN 511)
Eye protection	: During splash contact: face shield (EN166)
Body protection	: Wear suitable protective clothing. Overalls, apron and boots recommended.
Respiratory protection	: Use self-contained respiratory apparatus for rescue and maintenance work in storage vessels. Self-contained open-circuit compressed air breathing apparatus (EN 137). O2- Deficiency : Wear a positive-pressure supplied-air respirator.
Thermal hazard protection	: Use dedicated equipment.
Environmental exposure controls	: Avoid release to the environment. Comply with applicable Community environmental protection legislation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Press. Gas (Liq.).
Colour	: Colourless.
Odour	: Characteristic.
Odour threshold	: No data available
pH	: Not applicable
Relative evaporation rate (butylacetate=1)	: No data available
Melting / freezing point	: -159,6 °C
Freezing point	: No data available
Initial boiling point and boiling range	: -11,7 °C
Flash point	: < -56 °C
Auto-ignition temperature	: 460 °C
Decomposition temperature	: No data available
Flammability	: Extremely flammable
Vapour pressure	: 304 kPa
Vapour density	: 2 (Air=1)
Relative density	: 0,56 – 0,59
Solubility	: Water: very low
Partition coefficient n-octanol/water	: 1 – 2,8
Kinematic viscosity	: No data available
Dynamic viscosity	: No data available
Explosive properties	: Not applicable. The study does not need to be conducted because there are no chemical groups associated with explosive properties present in the molecule.
Oxidising properties	: Not applicable. The classification procedure needs not to be applied because there are no chemical groups present in the molecule which are associated with oxidising properties.
Explosive limits	: 1,8 – 8,4 vol %

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Particle size	: Not applicable
Particle size distribution	: Not applicable
Particle shape	: Not applicable
Particle aspect ratio	: Not applicable
Particle aggregation state	: Not applicable
Particle agglomeration state	: Not applicable
Particle specific surface area	: Not applicable
Particle dustiness	: Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes

No additional information available

9.2.2. Other safety characteristics

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Extremely flammable gas. Contains gas under pressure; may explode if heated. Reference to other sections: 10.4 & 10.5.

10.2. Chemical stability

The product is stable under storage at normal ambient temperatures.

10.3. Possibility of hazardous reactions

Reacts violently with : Strong oxidizing agents. Acids.

10.4. Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Protect from sunlight. See Section 7 for information on safe handling.

10.5. Incompatible materials

Strong oxidizing agents. See Section 7 for information on safe handling.

10.6. Hazardous decomposition products


Hazardous decomposition products formed under fire conditions. Reference to other sections 5.2.

SECTION 11: Toxicological information

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

Acute toxicity : Not classified (Based on available data, the classification criteria are not met)

Isobutane (75-28-5)	
LC50/inhalation/4h/rat	> 800000 ppm
LC50/inhalation/4h/rat (ppm)	> 800000 ppm (Exposure time: 15 min)
propane (74-98-6)	
LC50/inhalation/4h/rat (ppm)	> 800000 ppm (Exposure time: 15 min)
butane (106-97-8)	
LC50/inhalation/4h/rat	658 g/m ³ (Exposure time: 4 h)

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Skin corrosion/irritation	: Not classified (Based on available data, the classification criteria are not met) pH: Not applicable
Serious eye damage/irritation	: Not classified (Based on available data, the classification criteria are not met) pH: Not applicable
Respiratory or skin sensitisation	: Not classified (Based on available data, the classification criteria are not met)
Germ cell mutagenicity	: Not classified (Based on available data, the classification criteria are not met)
Carcinogenicity	: Not classified (Based on available data, the classification criteria are not met)
Reproductive toxicity	: Not classified (Based on available data, the classification criteria are not met)
STOT-single exposure	: Not classified (Based on available data, the classification criteria are not met)
STOT-repeated exposure	: Not classified (Based on available data, the classification criteria are not met)
Aspiration hazard	: Not classified (Based on available data, the classification criteria are not met)

ISOBUTANE (75-28-5)	
Kinematic viscosity	No data available

Other information	: Symptoms related to the physical, chemical and toxicological characteristics. For further information see section 4.
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11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Adverse health effects caused by endocrine disrupting properties	: The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605
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11.2.2 Other information

Other information	: Symptoms related to the physical, chemical and toxicological characteristics, For further information see section 4
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SECTION 12: Ecological information


12.1. Toxicity

Environmental properties	: According to the criteria of the European classification and labelling system, the substance/the product has not to be labelled as "dangerous for the environment".
Hazardous to the aquatic environment, short-term (acute)	: Not classified
Hazardous to the aquatic environment, long-term (chronic)	: Not classified

Isobutane (75-28-5)	
LC50 - Fish [1]	24,11 – 147,54 mg/l (96h)
EC50 - Crustacea [1]	14,22 – 69,43 mg/l (48h)
ErC50 algae	7,71 – 19,37 mg/l

12.2. Persistence and degradability

ISOBUTANE (75-28-5)	
Persistence and degradability	Readily biodegradable.

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12.3. Bioaccumulative potential

ISOBUTANE (75-28-5)	
Partition coefficient n-octanol/water	1 – 2,8
Bioaccumulative potential	No additional information available.

Isobutane (75-28-5)	
BCF - Fish [1]	1,57 – 1,97

propane (74-98-6)	
Partition coefficient n-octanol/water	1,09 (at 20 °C (at pH 7))

butane (106-97-8)	
Partition coefficient n-octanol/water	2,31 (at 20 °C (at pH 7))

12.4. Mobility in soil

ISOBUTANE (75-28-5)	
Mobility in soil	No data available
Ecology - soil	No data available.

12.5. Results of PBT and vPvB assessment


ISOBUTANE (75-28-5)	
This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII	
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII	

12.6. Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties : The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

12.7. Other adverse effects

Other adverse effects : No data available

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations






: Avoid release to the environment. Dispose of empty containers and wastes safely. See Section 7 for information on safe handling. Refer to manufacturer/supplier for information on recovery/recycling. Recycling is preferred to disposal or incineration. If recycling is not possible, eliminate in accordance with local valid waste disposal regulations. Handle contaminated packages in the same way as the substance itself. Dispose of contaminated materials in accordance with current regulations. Packaging contaminated by the product : Do not pierce or burn, even after use. Never use pressure to empty container.

European waste catalogue (2001/573/EC, 75/442/EEC, 91/689/EEC)

: This material and its container must be disposed of as hazardous waste
Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN


ADR	IMDG	IATA	ADN	RID
14.1. UN number				
1969	1969	1969	1969	1969
14.2. UN proper shipping name				
ISOBUTANE	ISOBUTANE	Isobutane	ISOBUTANE	ISOBUTANE
Transport document description				
UN 1969 ISOBUTANE, 2.1, (B/D)	UN 1969 ISOBUTANE, 2.1	UN 1969 Isobutane, 2.1	UN 1969 ISOBUTANE, 2.1	UN 1969 ISOBUTANE, 2.1
14.3. Transport hazard class(es)				
2.1	2.1	2.1	2.1	2.1
				
14.4. Packing group				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.5. Environmental hazards				
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No	Dangerous for the environment : No
No supplementary information available				

14.6. Special precautions for user

Special precautions for user : No data available

- Overland transport

Classification code (ADR) : 2F
 Special provisions : 392, 657, 662, 674
 Limited quantities (ADR) : 0
 Excepted quantities (ADR) : E0
 Packing instructions (ADR) : P200
 Mixed packing provisions (ADR) : MP9

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Portable tank and bulk container instructions (ADR) : (M), T50
 Tank code (ADR) : PxBN(M)
 Tank special provisions (ADR) : TA4, TT9
 Vehicle for tank carriage : FL
 Transport category (ADR) : 2
 Special provisions for carriage - Loading, unloading and handling (ADR) : CV9, CV10, CV36
 Special provisions for carriage - Operation (ADR) : S2, S20
 Hazard identification number (Kemler No.) : 23

Orange plates :

23
1969

Tunnel restriction code : B/D
 EAC code : 2YE

- Transport by sea


Special provisions (IMDG) : 392
 Limited quantities (IMDG) : 0
 Excepted quantities (IMDG) : E0
 Packing instructions (IMDG) : P200
 Tank instructions (IMDG) : T50
 EmS-No. (Fire) : F-D
 EmS-No. (Spillage) : S-U
 Stowage category (IMDG) : E
 Stowage and handling (IMDG) : SW2
 Properties and observations (IMDG) : Flammable hydrocarbon. Heavier than air.

- Air transport

PCA Excepted quantities (IATA) : E0
 PCA Limited quantities (IATA) : Forbidden
 PCA limited quantity max net quantity (IATA) : Forbidden
 PCA packing instructions (IATA) : Forbidden
 PCA max net quantity (IATA) : Forbidden
 CAO packing instructions (IATA) : 200
 CAO max net quantity (IATA) : 150kg
 Special provisions (IATA) : A1
 ERG code (IATA) : 10L

- Inland waterway transport

Classification code (ADN) : 2F
 Special provisions (ADN) : 392, 657, 662, 674
 Limited quantities (ADN) : 0
 Excepted quantities (ADN) : E0

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Carriage permitted (ADN) : T
 Equipment required (ADN) : PP, EX, A
 Ventilation (ADN) : VE01
 Number of blue cones/lights (ADN) : 1

- Rail transport

Classification code (RID) : 2F
 Special provisions (RID) : 392, 657, 662, 674
 Limited quantities (RID) : 0
 Excepted quantities (RID) : E0
 Packing instructions (RID) : P200
 Mixed packing provisions (RID) : MP9
 Portable tank and bulk container instructions (RID) : T50(M)
 Tank codes for RID tanks (RID) : PxBN(M)
 Special provisions for RID tanks (RID) : TU38, TE22, TA4, TT9, TM6
 Transport category (RID) : 2
 Special provisions for carriage - Loading, unloading and handling (RID) : CW9, CW10, CW36
 Colis express (express parcels) (RID) : CE3
 Hazard identification number (RID) : 23

14.7. Maritime transport in bulk according to IMO instruments

Code: IBC : No data available.

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

The following restrictions are applicable according to Annex XVII of the REACH Regulation (EC) No 1907/2006:


40. Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 or not.	ISOBUTANE ; Isobutane ; propane ; butane
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ISOBUTANE is not on the REACH Candidate List

ISOBUTANE is not on the REACH Annex XIV List

15.1.2. National regulations

France

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No ICPE	Installations classées Désignation de la rubrique	Code Régime	Rayon
4718.text	Gaz inflammables liquéfiés de catégorie 1 et 2 (y compris GPL) et gaz naturel (y compris biogaz affiné, lorsqu'il a été traité conformément aux normes applicables en matière de biogaz purifié et affiné, en assurant une qualité équivalente à celle du gaz naturel, y compris pour ce qui est de la teneur en méthane, et qu'il a une teneur maximale de 1 % en oxygène). La quantité totale susceptible d'être présente dans les installations y compris dans les cavités souterraines (strates naturelles, aquifères, cavités salines et mines désaffectées) étant :		
4718.1	1. Supérieure ou égale à 50 t Quantité seuil bas au sens de l'article R. 511-10 : 50 t. Quantité seuil haut au sens de l'article R. 511-10 : 200 t.	A	1
4718.2	2. Supérieure ou égale à 6 t mais inférieure à 50 t Quantité seuil bas au sens de l'article R. 511-10 : 50 t. Quantité seuil haut au sens de l'article R. 511-10 : 200 t.	DC	1

Germany

Regulatory reference	: WGK nwg, Non-hazardous to water (Classification according to AwSV)
German storage class (LGK)	: LGK 2A - Gases (except aerosol dispensers and lighters)
Hazardous Incident Ordinance (12. BlmSchV)	: Listed in the 12. BlmSchV (Annex I) under: 1.2.2 Quantity threshold for operational area under § 1 para. 1 <ul style="list-style-type: none"> - Sentence 1: 10000 kg - Sentence 2: 50000 kg

Netherlands

Waterbezwaarlijkheid	: B (4) - Weinig schadelijk voor in het water levende organismen
SZW-lijst van kankerverwekkende stoffen	: The substance is not listed
SZW-lijst van mutagene stoffen	: The substance is not listed
SZW-lijst van reprotoxische stoffen – Borstvoeding	: The substance is not listed
SZW-lijst van reprotoxische stoffen – Vruchtbaarheid	: The substance is not listed
SZW-lijst van reprotoxische stoffen – Ontwikkeling	: The substance is not listed

Denmark


Class for fire hazard	: Class I-1
Store unit	: 1 liter
Classification remarks	: F+ <Flam. Gas 1A; Press. Gas (Liq.)>; Emergency management guidelines for the storage of flammable liquids must be followed
Recommendations Danish Regulation	: Young people below the age of 18 years are not allowed to use the product

15.2. Chemical safety assessment

For this substance a chemical safety assessment has been carried out

SECTION 16: Other information


Indication of changes:

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2.3	ED text	Added	
4.3	Indication of any immediate medical attention and special treatment needed	Added	
5.2	Hazardous decomposition products in case of fire	Added	
5.3	Protection during firefighting	Added	
5.3	Other information	Added	
6.1	For non-emergency personnel	Added	
7.2	Heat and ignition sources	Added	
7.2	Packaging materials	Added	
7.2	Special rules on packaging	Added	
7.3	Specific end use(s)	Added	
9.2	Information with regard to physical hazard classes	Added	
9.2	Other safety characteristics	Added	
11.2	Adverse health effects caused by endocrine disrupting properties	Added	
12.6	Adverse effects on the environment caused by endocrine disrupting properties	Added	
14.7	Maritime transport in bulk according to IMO instruments	Added	
15.1	Installations classées	Added	
15.1	12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV	Added	
15.1	Waterbezwaarlijkheid	Modified	

Abbreviations and acronyms:

	DNEL = Derived No Effect Level
	DMEL = Derived Minimal Effect level
	PNEC = Predicted No Effect Concentration
	OEL-STEL = Occupational Exposure Limits - Short Term Exposure Limits (STELs)
	TWA = time weighted average
	LC50 = Median lethal concentration
	LD50 = Median lethal dose
	LL50 = Median lethal level
	EC50 = Median Effective Concentration
	EL50 = Median effective level
	ErC50 = EC50 in terms of reduction of growth rate
	ErL50 = EL50 in terms of reduction of growth rate
	NOEL = no-observed-effect level
	NOEC = No observed effect concentration
	NOELR = No observed effect loading rate

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	NOAEC = No observed adverse effect concentration
	NOAEL = No observed adverse effect level
	EWC = European waste catalogue
	NA = Not applicable
	N.O.S. = Not Otherwise Specified
	VOC = Volatile organic compounds
	mg/kg BW = mg/kg bodyweight
	QSAR = Quantitative structure-activity relationship (QSAR)
	ADN = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC IATA = International Air Transport Association IMDG = International Maritime Dangerous Goods Code LEL = Lower Explosive Limit/Lower Explosion Limit UEL = Upper Explosion Limit/Upper Explosive Limit REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
	WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)
	ABM = Algemene beoordelingsmethodiek
	BTT = Breakthrough time (maximum wearing time)
	NOEL: no-observed-effect level
	STOT = Specific Target Organ Toxicity

Sources of key data used to compile the : European Chemicals Bureau SDS supplier, CSR. datasheet

Training advice : Training staff on good practice. Manipulations are to be done only by qualified and authorised persons.

Full text of H- and EUH-statements:

Flam. Gas 1	Flammable gases, Category 1
Flam. Gas 1A	Flammable gases, Category 1A
H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
Press. Gas	Gases under pressure
Press. Gas (Comp.)	Gases under pressure : Compressed gas
Press. Gas (Liq.)	Gases under pressure : Liquefied gas

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878
Classification according to Regulation (EC) No. 1272/2008 [CLP]
Labelling according to Regulation (EC) No. 1272/2008 [CLP]

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