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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/designation : ISOBUTANE
 EC Index : 601-004-00-0
 EC-No. : 200-857-2
 CAS-No. : 75-28-5
 REACH registration No. : 01-2119485395-27-0023
 Formula : C₄H₁₀
 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
REACHNIS@nis.rs

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.

Country/Area	Organisation/Company	Address	Emergency number	Comment
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)	

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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Flammable gases, Category 1A H220

Gases under pressure : Liquefied gas H280

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

Adverse physicochemical, human health and environmental effects

No additional information available

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.

P410+P403 - Protect from sunlight. Store in a well-ventilated place.

Listed on CLP Annex VI

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

2.3. Other hazards

Other hazards

: Results of PBT and vPvB assessment : This substance does not meet the PBT/vPvB criteria of 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

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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 REACH-no: 01-2119485395-27	≥ 97	Flam. Gas 1A, H220 Press. Gas (Liq.), H280
propane	CAS-No.: 74-98-6 EC-No.: 200-827-9 EC Index: 601-003-00-5	≤ 1,5	Flam. Gas 1A, H220 Press. Gas (Liq.), H280
butane	CAS-No.: 106-97-8 EC-No.: 203-448-7 EC Index: 601-004-00-0	≤ 1,5	Flam. Gas 1A, H220 Press. Gas (Liq.), H280

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

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.

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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : carbon dioxide (CO₂), 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, CO₂).

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.

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.

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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

: Gases under pressure. Liquefied gas. Keep container tightly closed. Store in a dry, cool and well-ventilated place. Do not store near or with any of the incompatible materials listed in section 10. Take precautionary measures against static discharge.

Incompatible materials

: Strong oxidizing agents.

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. Keep in properly labelled containers.

Packaging materials

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

Germany

German storage class (LGK)

: LGK 2A - Gases (except aerosol dispensers and lighters)

Switzerland

Storage class (LK)

: LK 2 - Liquefied or pressurized gases

7.3. Specific end use(s)

see section(s) : 1.2.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

isobutane (75-28-5)	
Austria - Occupational Exposure Limits	
Local name	Butan (beide Isomeren): Isobutan (2-Methylpropan) (R 600a)
MAK (OEL TWA)	1900 mg/m ³ (Butane (all isomers))
	800 ppm (Butane (all isomers))
MAK (OEL STEL)	3800 mg/m ³ (Butane both isomers)
	1600 ppm (Butane both isomers)
Regulatory reference	BGBl. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Butane, tous isomères: iso-butane # Butaan, alle isomeren: iso-butaan
OEL STEL	2370 mg/m ³
	980 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Estonia - Occupational Exposure Limits	
Local name	Isobutaan (2-metüülpropaan)
OEL TWA	1900 mg/m ³
	800 ppm
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	i-Butaani (2-Metyylipropaani)
HTP (OEL TWA)	1900 mg/m ³ (suffocating gas that displaces oxygen (Butane))
	800 ppm (suffocating gas that displaces oxygen (Butane))
HTP (OEL STEL)	2400 mg/m ³ (Butane)
	1000 ppm (Butane)
Remark	Happea syrjäyttämällä tukahduttavat kaasut.
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Isobutan
Occupational exposure limit value (mg/m ³) (TRGS900)	2400 mg/m ³
Occupational exposure limit value (ppm) (TRGS900)	1000 ppm
Peak exposure limitation factor	4(II)

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isobutane (75-28-5)	
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission)
Regulatory reference	TRGS900
Ireland - Occupational Exposure Limits	
Local name	Butane, all isomers: Isobutane
OEL STEL	1000 ppm
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Latvia - Occupational Exposure Limits	
Local name	Izobutāns (kas satur vairāk nekā 0,1 % butadiēna)
Remark	Carc. 1A; Muta. 1B
Regulatory reference	Ministru kabineta 2008. gada 29. septembra noteikumi Nr. 803 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 190).
Portugal - Occupational Exposure Limits	
Local name	Butano, todos os isómeros
OEL STEL	1000 ppm
Regulatory reference	Norma Portuguesa NP 1796:2014
Slovakia - Occupational Exposure Limits	
Local name	Bután s obsahom $\geq 0,1\%$ butadiénu (izo-bután)
NPHV (OEL TWA)	2400 mg/m ³
	1000 ppm
Remark	Kategória karcinogénnych faktorov 1A – Dokázaný karcinogén pre ľudí.
Regulatory reference	Nariadenie vlády č. 356/2006 Z. z. (121/2024 Z. z.)
Slovenia - Occupational Exposure Limits	
Local name	izobutan
OEL TWA	2400 mg/m ³
	1000 ppm
OEL STEL	9600 mg/m ³
	4000 ppm
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
North Macedonia - Occupational Exposure Limits	
Local name	изобутан
OEL TWA	2400 mg/m ³
	1000 ppm
KTV	4
Short time value [mg/m ³]	9600 mg/m ³

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isobutane (75-28-5)

Short time value	4000 ppm
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанции во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае највеќе 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m ³ или во ml/m ³ (ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија“ бр.46/10)

Switzerland - Occupational Exposure Limits

Local name	iso-Butane / iso-Butan
MAK (OEL TWA)	1900 mg/m ³ (including Butane (all isomers)
	800 ppm (including Butane (all isomers)
KZGW (OEL STEL)	7600 mg/m ³ (Butane both isomers)
	3200 ppm (Butane both isomers)
Regulatory reference	www.suva.ch, 01.01.2024

USA - ACGIH - Occupational Exposure Limits

Local name	Isobutane
ACGIH® TLV® STEL	1000 ppm (explosion hazard (Butane, isomers)
Remark (ACGIH)	TLV® Basis: CNS impair
Regulatory reference	ACGIH 2024

propane (74-98-6)

Austria - Occupational Exposure Limits

Local name	Propan (R 290)
MAK (OEL TWA)	1800 mg/m ³
	1000 ppm
MAK (OEL STEL)	3600 mg/m ³
	2000 ppm
Regulatory reference	BGBl. II Nr. 156/2021

Belgium - Occupational Exposure Limits

Local name	Hydrocarbures aliphatiques sous forme gazeuse: (Alcanes C1-C3) # Alifatische koolwaterstoffen in gas-vorm: Alkanen (C1-C3)
OEL TWA	1000 ppm (gas)
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023

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propane (74-98-6)	
Bulgaria - Occupational Exposure Limits	
Local name	Пропан
OEL TWA	1800 mg/m ³
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Denmark - Occupational Exposure Limits	
Local name	Propan (Flaskegas)
OEL TWA	1800 mg/m ³
	1000 ppm
OEL STEL	3600 mg/m ³
	2000 ppm
Regulatory reference	BEK nr 291 af 19/03/2024
Estonia - Occupational Exposure Limits	
Local name	Propaan
OEL TWA	1800 mg/m ³
	1000 ppm
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 21.12.2022, 3)
Finland - Occupational Exposure Limits	
Local name	Propaani
HTP (OEL TWA)	1500 mg/m ³ (suffocating gas that displaces oxygen)
	800 ppm (suffocating gas that displaces oxygen)
HTP (OEL STEL)	2000 mg/m ³
	1100 ppm
Remark	Happea syrjäyttämällä tukahduttavat kaasut.
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Propan
Occupational exposure limit value (mg/m ³) (TRGS900)	1800 mg/m ³
Occupational exposure limit value (ppm) (TRGS900)	1000 ppm
Peak exposure limitation factor	4(II)
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission)
Regulatory reference	TRGS900
Greece - Occupational Exposure Limits	
Local name	Προπάνιο

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propane (74-98-6)	
OEL TWA	1800 mg/m ³
	1000 ppm
Regulatory reference	Π.Δ. 90/1999 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Ireland - Occupational Exposure Limits	
Local name	Aliphatic hydrocarbon gases Alkanes (C1-C3): Propane
OEL STEL	3000 ppm (calculated (Aliphatic hydrocarbon gases - Alkanes (C1-C4))
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values), Asphx. (Gaseous chemical substances which may not produce significant physiological effects in the exposed employee, but when present in high concentrations will act as simple asphyxiants)
OEL chemical category	Simple asphyxiant
Regulatory reference	Chemical Agents Code of Practice 2024
Latvia - Occupational Exposure Limits	
Local name	Propāns
OEL TWA	1800 mg/m ³
	1000 ppm
Regulatory reference	Ministru kabineta 2007. gada 15. maija noteikumiem Nr. 325 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 191).
Poland - Occupational Exposure Limits	
Local name	Propan
NDS (OEL TWA)	1800 mg/m ³
Regulatory reference	Dz. U. 2018 poz. 1286 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
OEL TWA	1000 ppm
Romania - Occupational Exposure Limits	
Local name	Propan
OEL TWA	1400 mg/m ³
	778 ppm
OEL STEL	1800 mg/m ³
	1000 ppm
Regulatory reference	Hotărârea Guvernului nr. 1.218/2006 (Hotărârea nr. 53/2021)
Slovenia - Occupational Exposure Limits	
Local name	propan
OEL TWA	1800 mg/m ³
	1000 ppm
OEL STEL	7200 mg/m ³
	4000 ppm

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propane (74-98-6)	
Regulatory reference	Uradni list RS, št. 29/2024 z dne 4. 4. 2024 - Pravilnik o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
Spain - Occupational Exposure Limits	
Local name	Propano
VLA-ED (OEL TWA)	1000 ppm Hidrocarburos alifáticos alcanos (C1 – C4) y sus mezclas, gases (Butano; Etano; Metano; Propano)
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
Iceland - Occupational Exposure Limits	
Local name	Própan (flöskugas)
OEL TWA	1800 mg/m ³
	1000 ppm
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Propan
Grenseverdi (OEL TWA)	900 mg/m ³
	500 ppm
Korttidsverdi (OEL STEL)	1125 mg/m ³ (value calculated)
	625 ppm (value calculated)
Regulatory reference	FOR-2023-12-18-2278
North Macedonia - Occupational Exposure Limits	
Local name	Пропан
OEL TWA	1800 mg/m ³
	1000 ppm
KTV	4
Short time value [mg/m ³]	7200 mg/m ³
Short time value	4000 ppm
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанции во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае највеќе 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m ³ или во ml/m ³ (ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија“ бр.46/10)

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propane (74-98-6)	
Switzerland - Occupational Exposure Limits	
Local name	Propane / Propan
MAK (OEL TWA)	1800 mg/m ³
	1000 ppm
KZGW (OEL STEL)	7200 mg/m ³
	4000 ppm
Remark	NIOSH
Regulatory reference	www.suva.ch, 01.01.2024
USA - ACGIH - Occupational Exposure Limits	
Local name	Propane
Remark (ACGIH)	TLV® Basis: Simple Asphyxiant
ACGIH chemical category	Simple asphyxiant See Appendix F: Minimal Oxygen Content
Regulatory reference	ACGIH 2024

butane (106-97-8)	
Austria - Occupational Exposure Limits	
Local name	Butan (beide Isomeren): n-Butan (R 600)
MAK (OEL TWA)	1900 mg/m ³ (Butane (all isomers))
	800 ppm (Butane (all isomers))
MAK (OEL STEL)	3800 mg/m ³
	1600 ppm
Regulatory reference	BGBl. II Nr. 156/2021
Belgium - Occupational Exposure Limits	
Local name	Butane, tous isomères: n-butane # Butaan, alle isomeren: n-butaan
OEL STEL	2370 mg/m ³
	980 ppm
Regulatory reference	Koninklijk besluit/Arrêté royal 16/11/2023
Bulgaria - Occupational Exposure Limits	
Local name	н-Бутан
OEL TWA	1900 mg/m ³
Regulatory reference	Наредба № 13 от 30.12.2003 г. за защита на работещите от рискове, свързани с експозиция на химични агенти при работа (изм. и доп. ДВ. бр. 28 от 2024 г., в сила от 05.04.2024 г.)
Croatia - Occupational Exposure Limits	
GVI (OEL TWA)	1450 mg/m ³
	22 mg/m ³ (containing >=0.1% Butadiene)
	600 ppm
	10 ppm (containing >=0.1% Butadiene)

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butane (106-97-8)	
KGVI (OEL STEL)	1810 mg/m ³
	750 ppm
OEL chemical category	Carcinogen Category 1A containing >=0.1% Butadiene, Mutagen Category 1B containing >=0.1% Butadiene
Denmark - Occupational Exposure Limits	
Local name	n-Butan
OEL TWA	1200 mg/m ³
	500 ppm
OEL STEL	2400 mg/m ³
	1000 ppm
Regulatory reference	BEK nr 291 af 19/03/2024
Estonia - Occupational Exposure Limits	
Local name	n-butaan
OEL TWA	1500 mg/m ³
	800 ppm
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)
Finland - Occupational Exposure Limits	
Local name	n-Butaani
HTP (OEL TWA)	1900 mg/m ³ (suffocating gas that displaces oxygen (Butane))
	800 ppm (suffocating gas that displaces oxygen (Butane))
HTP (OEL STEL)	2400 mg/m ³
	1000 ppm
Remark	Happea syrjäyttämällä tukahduttavat kaasut.
Regulatory reference	HTP-ARVOT 2020 (Sosiaali- ja terveysministeriö)
France - Occupational Exposure Limits	
Local name	n-Butane
VME (OEL TWA)	1900 mg/m ³
	800 ppm
Remark	Valeurs recommandées/admises
Regulatory reference	Circulaire du Ministère du travail (réf.: INRS ED 6443, 2022; Outil65)
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Butan
Occupational exposure limit value (mg/m ³) (TRGS900)	2400 mg/m ³
Occupational exposure limit value (ppm) (TRGS900)	1000 ppm
Peak exposure limitation factor	4(II)

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butane (106-97-8)	
Remark	DFG - Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission)
Regulatory reference	TRGS900
Greece - Occupational Exposure Limits	
Local name	Βουτάνιο
OEL TWA	2350 mg/m ³ 1000 ppm
Regulatory reference	Π.Δ. 90/1999 - Προστασία της υγείας των εργαζομένων που εκτίθενται σε ορισμένους χημικούς παράγοντες κατά τη διάρκεια της εργασίας τους
Hungary - Occupational Exposure Limits	
Local name	n-BUTÁN
AK (OEL TWA)	2350 mg/m ³
CK (OEL STEL)	9400 mg/m ³
Remark	N (Irritáló anyagok, egyszerű fojtógázok, csekély egészségkárosító hatással bíró anyagok)
Regulatory reference	5/2020. (II. 6.) ITM rendelet - A kémiai kóroki tényezők hatásának kitett munkavállalók egészségének és biztonságának védelméről
Ireland - Occupational Exposure Limits	
Local name	Butane, all isomers: Butane
OEL TWA	1000 ppm (Aliphatic hydrocarbon gases - Alkanes (C1-C4))
OEL STEL	3000 ppm (calculated)
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
Latvia - Occupational Exposure Limits	
Local name	Butāns (kas satur vairāk nekā 0,1 % butadiēna)
OEL TWA	300 mg/m ³
Remark	Carc. 1A; Muta. 1B
Regulatory reference	Ministru kabineta 2008. gada 29. septembra noteikumi Nr. 803 (Grozījumi Ministru kabineta 2024. gada 26. martā noteikumiem Nr. 190).
Poland - Occupational Exposure Limits	
Local name	Butan
NDS (OEL TWA)	1900 mg/m ³
NDSch (OEL STEL)	3000 mg/m ³
Regulatory reference	Dz. U. 2024 poz. 1017 wraz z późn. zm.
Portugal - Occupational Exposure Limits	
Local name	Butano, todos os isómeros
OEL STEL	1000 ppm
Regulatory reference	Norma Portuguesa NP 1796:2014

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butane (106-97-8)	
Slovakia - Occupational Exposure Limits	
Local name	Bután s obsahom $\geq 0,1\%$ butadiénu (n-bután)
NPHV (OEL TWA)	2400 mg/m ³
	1000 ppm
Remark	Kategória karcinogénnych faktorov 1A – Dokázaný karcinogén pre ľudí.
Regulatory reference	Nariadenie vlády č. 356/2006 Z. z. (121/2024 Z. z.)
Slovenia - Occupational Exposure Limits	
OEL TWA	2400 mg/m ³ (containing $\geq 0.1\%$ Butadiene)
	1000 ppm (containing $\geq 0.1\%$ Butadiene)
OEL STEL	9600 mg/m ³ (containing $\geq 0.1\%$ Butadiene)
	4000 ppm (containing $\geq 0.1\%$ Butadiene)
OEL chemical category	Category 1B containing $\geq 0.1\%$ Butadiene, Category 1A containing $\geq 0.1\%$ Butadiene
Spain - Occupational Exposure Limits	
Local name	Butano
VLA-ED (OEL TWA)	1000 ppm Hidrocarburos alifáticos alcanos (C1 – C4) y sus mezclas, gases (Butano; Etano; Metano; Propano)
Regulatory reference	Límites de Exposición Profesional para Agentes Químicos en España 2024. INSHT
United Kingdom - Occupational Exposure Limits	
Local name	Butane
WEL TWA (OEL TWA)	1450 mg/m ³
	600 ppm
WEL STEL (OEL STEL)	1810 mg/m ³
	750 ppm
Remark	Carc (Capable of causing cancer and/or heritable genetic damage, only applies if Butane contains more than 0.1% of buta-1,3-diene)
WEL chemical category	Capable of causing cancer and/or heritable genetic damage containing $>0.1\%$ Buta-1,3-diene
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
Iceland - Occupational Exposure Limits	
Local name	n-Bútan
OEL TWA	1200 mg/m ³
	500 ppm
Regulatory reference	Reglugerð um mengunarmörk og aðgerðir til að draga úr mengun á vinnustöðum (Nr. 390/2009)
Norway - Occupational Exposure Limits	
Local name	Butan

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butane (106-97-8)	
Grenseverdi (OEL TWA)	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)).
	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)).
Kortidsverdi (OEL STEL)	750 mg/m ³ (value calculated)
	312,5 ppm (value calculated)
Regulatory reference	FOR-2024-04-05-581
North Macedonia - Occupational Exposure Limits	
Local name	Бутан
OEL TWA	2400 mg/m ³
	1000 ppm
KTV	4
Short time value [mg/m ³]	9600 mg/m ³
Short time value	4000 ppm
Remark	(KTV) краткотрајна вредност (КТВ) значи концентрација на опасни хемиски супстанции во воздухот на работното место внатре во зона на дишење, на која работникот без опасност по здравјето може да е изложен на покусо време. Изложеноста на краткотрајни вредности може да трае највеќе 15 минути и не смее да се повтори повеќе од четирипати во работната смена, при што меѓу две изложености на оваа концентрација мора да измине најмалку 60 минути. Краткотрајната вредност е изразена во mg/m ³ или во ml/m ³ (ppm) а е дадена како многукратни дозволени пречекорувања на граничната вредност
Regulatory reference	Правилник за минималните барања за безбедност и здравје при работа на вработени од ризици поврзани со изложување на хемиски супстанции („Службен весник на Република Македонија” бр.46/10)
Switzerland - Occupational Exposure Limits	
Local name	n-Butane / n-Butan
MAK (OEL TWA)	1900 mg/m ³ (Butane (all isomers))
	800 ppm (Butane (all isomers))
KZGW (OEL STEL)	7600 mg/m ³ (Butane both isomers)
	3200 ppm (Butane both isomers)
Regulatory reference	www.suva.ch, 01.01.2024
USA - ACGIH - Occupational Exposure Limits	
Local name	Butane
ACGIH® TLV® STEL	1000 ppm (explosion hazard (Butane, isomers))
Remark (ACGIH)	TLV® Basis: CNS impair
Regulatory reference	ACGIH 2024

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8.1.2. Recommended monitoring procedures

Monitoring methods	
Monitoring methods	Personal air monitoring. Concentration measurement in air. Personal air monitoring. Room air monitoring.

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

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

8.1.5. Control banding

No additional information available

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.
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. Suitable material: cold insulating gloves (EN 511). Breakthrough time : refer to the recommendations of the supplier. Thickness of the glove material: Not determined
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.

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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Gas
Colour	: Colourless.
Appearance	: Press. Gas (Liq.). liquefied gas.
Odour	: Characteristic.
Odour threshold	: No data available
Melting / freezing point	: -159,6 °C
Freezing point	: Not applicable
Initial boiling point and boiling range	: -11,7 °C
Flammability	: Extremely flammable gas.
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.
Lower explosion limit	: Not available
Upper explosion limit	: Not available
Flash point	: < -56 °C
Auto-ignition temperature	: 460 °C
Decomposition temperature	: No data available
pH	: Not applicable
Kinematic viscosity	: No data available
Dynamic viscosity	: No data available
Solubility	: Water: very low
Partition coefficient n-octanol/water (Log Kow)	: 1 – 2,8
Vapour pressure	: 304 kPa
Vapour pressure at 50°C	: Not available
Density	: Not applicable
Relative density	: 0,56 – 0,59
Vapour density	: 2 (Air=1)
Particle characteristics	: Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Explosion limits	: 1,8 – 8,4 vol %
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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.

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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

Carbon oxides (CO, CO₂). 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 (oral)	: Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (dermal)	: Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (inhalation)	: 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 Source: ECHA_API)

propane (74-98-6)	
LC50/inhalation/4h/rat (ppm)	> 800000 ppm (Exposure time: 15 min Source: ECHA_API)

butane (106-97-8)	
LC50/inhalation/4h/rat	658 g/m ³ (Exposure time: 4 h Source: NLM_CIP)

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)

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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 applicable

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

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 (Log Kow)	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)	
Results of PBT assessment	This substance does not meet the PBT/vPvB criteria of REACH, 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 or ID 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 :



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

REACH Annex XVII (Restriction List)

EU restriction list (REACH Annex XVII)		
Reference code	Applicable on	Entry title or description
40.	ISOBUTANE ; isobutane ; propane ; butane	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.

REACH Annex XIV (Authorisation List)

Not listed on REACH Annex XIV (Authorisation List)

REACH Candidate List (SVHC)

Contains no substance(s) listed on the REACH Candidate List

PIC Regulation (Prior Informed Consent)

Not listed on the PIC list (Regulation EU 649/2012)

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POP Regulation (Persistent Organic Pollutants)

Not listed on the POP list (Regulation EU 2019/1021)

Ozone Regulation (2024/590)

Not listed on the Ozone Depletion list (Regulation EU 2024/590)

Council Regulation (EC) for the control of dual-use items

Contains no substance subject to the COUNCIL REGULATION (EC) for the control of dual-use items

Explosives Precursors Regulation (EU 2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

Drug Precursors Regulation (EC 273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

Detergent Regulation (648/2004/EC): Labelling of contents

Labelling for contents according to : Not applicable
regulation (EC) No. 648/2004

15.1.2. National regulations

France

Installations classées			
No ICPE	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

Water hazard class (WGK) : WGK nwg, Non-hazardous to water (Not classified according to Regulation Governing Systems for Handling Substances Hazardous to Waters (AwSV); ID No. 562).

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Major Accidents Ordinance (12. BImSchV) : Listed in the 12. BImSchV (Annex I) under: 2.1
- Quantity threshold for operational area under § 1 para. 1
- Sentence 1 :50000 kg
- Sentence 2 :200000 kg

Netherlands

Waterbezwaarlijkheid : B (5) - 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
Danish National Regulations : 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:

1.3	Details of the supplier of the safety data sheet	Modified	
16	Other information	Added	

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
	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

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	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 datasheet : ECHA (European Chemicals Agency). CSR = Chemical Safety Report. Supplier information.

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

Other information : Hazard classification and labeling of petroleum substances in the European Economic Area, Concawe – 2025 (<http://www.concawe.eu>).

Full text of H- and EUH-statements:

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

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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