SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

1.1. Product identifier

- Trading name: **C4 FRACTION**
- Chemical name: Hydrocarbons, C_4; Petroleum gas
  Petroleum gas; Hydrocarbons, C_4
- REACH registration number: 01-2119475607-28-0001
- UFI code: irrelevant for substances
- Index number: 649-113-00-2
- CAS number: 87741-01-3
- ES number: 289-339-5

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

1.2.1. Designated use

Intermediate product for the production of chemicals, used during its entire life cycle under strictly controlled conditions defined in Article 18(4) of Directive (EC) No. 1907/2006 REACH – see Section 16.

1.2.2. Unrecommended uses

The substance was registered as a transported isolated intermediate product, used during its entire life cycle under strictly controlled conditions defined in Article 18(4) of Directive (EC) No. 1907/2006 REACH – see Section 16. That is why it must not be handled in any other way.

1.3. Details of the supplier of the safety data sheet

manufacturer: ORLEN Unipetrol RPA s.r.o., Záluží 1, 436 70 Litvínov, Czech Republic
ID No.: 27597075
☎: +420 476 161 111
fax: +420 476 619 553
info@orlenunipetrol.cz
www.orlenunipetrolrpa.cz

Other contacts:

- Director of the Monomers and Chemicals Unit: ☎: +48 242 566 615; e-mail: Dorota.Smolarek@orlen.pl
- Key Account Manager: ☎: +48 691 991 378; e-mail: Marta.Rosul@orlen.pl
- Head of Customer Service Department: ☎: +420 476 162 006; Lucie.Markova@orlenunipetrol.cz
- Person professionally qualified to compile a SDS: reach.unirpa@orlenunipetrol.cz

1.4. Emergency telephone number

- CONTROLroom of ORLEN Unipetrol RPA s.r.o. ☎:+420 476 163 111 (NON STOP)
- Toxicological information center (TIS) ☎:+420 224 919 293 (NON STOP)
  Na bojišti 1, 120 00 Prague 2, Czech Republic ☎:+420 224 915 402 (NON STOP)
  email: tis@vfn.cz
- Transportation information and accident system (TRINS) ☎:+420 476 163 111 (NON STOP)

Note: Emergency phone numbers for the EU countries are included is section 16

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to Directive (EC) No. 1272/2008 CLP:

FLAMMABLE GAS, CATEGORY 1A	**Flam. Gas 1A, H 220**
CARCINOGENICITY, CATEGORY 1A	**Carc. 1A, H 350**
MUTAGENICITY, CATEGORY 1B	**Muta. 1B, H 340**
PRESSURIZED GASES (LIQUEFIED GAS)	**Press. gas (Liquefied gas), H 280**

Note: Complete wording of the H-statements and/or EUH-statements is included in Section 16

2.2. Label elements

product identifiers		**C4 FRACTION** HYDROCARBONS, C4; PETROLEUM GAS index number: 601-011-00-9
warning hazard symbol		
signal word		**DANGER**
H-statements (standard hazard statements)	H220 H280 H340 H350	Extremely flammable gas. Contains gas under pressure; may explode if heated. May cause genetic defects May cause cancer.
P-instructions (safe handling instructions)	P202 P210 P243 P280 P377 P381 P410+P403	Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take action to prevent static discharges. Wear protective gloves/protective clothing/eye protection/face protection. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. In case of leakage, eliminate all ignition sources. Protect from sunlight. Store in a well-ventilated place.
additional information		Only for professional users.
		ORLEN Unipetrol RPA s.r.o. Záluží 1, 436 70 Litvínov, Czech Republic ☎: +420 476 161 111, +420 476 163 111

2.3. Other hazards

The product is an easily ignitable liquified gas. The liquified product quickly evaporates and can cause frostbites upon contact. Released gas is heavier than air and can spread very far. It forms an explosive mixture with air. Fire or explosion can thus occur upon initiation even far from a given leak source. Released gas displaces oxygen, thus creating a risk of suffocation. This explosion and suffocation risk is particularly present below the terrain level and in enclosed areas.

For the product assessment from the perspective of the PBT / vPvB criteria, see Subsection 12.5 ("Results of the PBT and vPvB assessment").

The substance is not included in the candidate list pursuant to Article 59 (Paragraph 1) of the REACH Directive (SVHC).

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

substance name:	HYDROCARBONS, C4; PETROLEUM GAS
index number (index):	649-113-00-2
CAS number:	87741-01-3

ES number:	289-339-5

components included in this UVCB substance • *in a concentration of ≥ 10% or* • *influencing classification of this substance:*	*NAME:*	*IDENTIFIER:*
	1,3-butadiene	*buta-1,3-diene (index 601-013-00-X, CAS 106-99-0, ES 203-450-8)*
	isobutene	*2-methylpropene (index 601-012-00-4, CAS 115-11-7,* ES 204*-066-3)*
	1-butene	*but-1-ene (index 601-012-00-4, CAS 106-98-9, ES 203-449-2)*

Note 1: The substance is not or not contain a nanoform.

Note 2: Specific concentration limits (SCL), M-factor (M-) and Acute toxicity estimate (ATE) were not determined for this UVCB substance (harmonized classification).

Note 3: the product contains stabilizing additive/peroxide formation inhibitor in concentrations that do not exceed 0,015% (m/m), without impact on classification.

3.2. Mixtures

Not applicable, the product is a substance.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

4.1.1. General instructions

When administering first aid, observe your own safety.
Call emergency medical services (☎155 ČR, ☎120 EU) and follow their instructions until their arrival. First aid must be always administered with the objective to preserve the basic bodily functions - should the victim become unconscious or should he/she stop breathing, start resuscitation immediately (chest compression and mouth-to-mouth resuscitation with the 30:2 ratio). When the victim is unconscious but is breathing NORMALLY, put him/her in the recovery position. The condition of the patient can change very quickly, so you need to watch him/her constantly and continuously monitor his/her consciousness status and breathing.
If the person is in unconscious or if he/she has spasms, do not put anything in his/her mouth, just put him/her into a stabilised position.

4.1.2. Upon inhalation

In order to ensure your own safety, transport the victim to fresh air, do not let him/her become cold and seek medical assistance.

4.1.3. Upon contact with skin

Should you experience frostbites, do not remove the frozen clothes and thoroughly rinse the affected area with water (not hot) for at least 15 minutes. Do not rub the frostbitten spots. Cover them only with sterile dressing or a clean piece of fabric. Seek medical assistance.

4.1.4. If the products hits eyes

Immediately start rinsing your eyes with lids wide open with flowing lukewarm water. Do so for at least 15 minutes. Should the victim wear contact lenses, remove them prior to rinsing. Immediately seek professional medical assistance if the liquefied gas comes into contact with eyes since the eyes could become seriously damaged if frostbitten.

4.1.5. Upon ingestion

Ingestion does not represent a probable exposure manner. However, mouth and lips can develop frostbites if they come into contact with the liquified gas. In that case rinse your mouth with lukewarm water and seek professional medical assistance immediately.

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

Lack of oxygen causes fatigue, sleepiness, faintness, dizziness, nausea, vomiting, loss of coordination, attention disorder, judgment errors, confusion. The victim does not have to be aware of the fact he/she is suffocating and can quickly fall unconscious and suffocate. Should frostbites occur, the frostbitten spots are pale, cold and insensitive; later on, they can redden, get swollen and the victim can feel tingling, burning and pain.

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

Should the liquified gas be inhaled or should it come in contact with eyes, immediate medical assistance is necessary.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable fire extinguishers: heavy foam, water spray or water mist.
Unsuitable fire extinguishers: direct water stream.
Extinguishing small fires: powder or snow (CO_2) fire extinguishers, dry sand or fire extinguishing foam.

5.2. Special hazards arising from the substance or mixture

Do not attempt to extinguish the fire if the leak source is not removed. If this is not possible, let the fire die out on its own and keep cooling containers in the fire surroundings using water. A strong reaction or explosion can occur otherwise. Vapors can spread quite far and, should they come in contact with an ignition source, can cause a reverse flare and subsequent explosion and/or fire. The gas is heavier than the air. It accumulates by the ground and in enclosed areas, where an explosion and suffocation can occur. Containers with the substance can explode when heated. Its burning can create toxic smokes that contain carbon monoxide, carbon dioxide and unburned carbohydrates.

5.3. Advice for firefighters

Limit penetration of the fire extinguishing liquid polluted with the given substance to the sewerage system, surface and underground water and soil to a minimum. When leaked into the sewerage system, there is a risk of an explosion and subsequent burning.
Cool the tanks containing the product with water spray because they can explode due to heat.
Do not use foam and water simultaneously since water decomposes the foam.
Protection equipment for the fire fighters: fully protective clothing and insulation breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Seal the accident location and prevent access to the endangered area. Stay on the windward side. Leaks of this product can cause fires. That is why you need to remove all possible ignition sources. Do not smoke and do not handle open flame. If possible, ensure adequate ventilation of the enclosed areas. Prevent contact with the substance and its vapors. When rectifying the given extraordinary event/accident consequences, use all the recommended personal protection equipment (see Subsection 8.2). Evacuate all people from the endangered area in the case of larger accidents. If initiated, the substance vapors below the terrain level and in enclosed areas (including the sewerage system space) can explode or suffocate people.

6.2. Environmental precautions

Eliminate any further leaks of the substance and fence off the location. Should the liquified gas leak, prevent its penetration into the sewerage system and surface and underground water by covering the sewerage system inlets. Prevent the substance from leaking to soil.

6.3. Methods and material for containment and cleaning up

When the liquified gas leaks, its evaporation quickly increases without an efficient possibility to influence this process. Use water spray for reducing the vapors in the air. Increase ventilation intensity at the leak location, especially in enclosed areas, and monitor the gas concentration in the air.
When the product remains in its liquid state due to low temperatures when the weather is cold, draw the substance to enclosed containers prior to its subsequent processing.

6.4. Reference to other sections

For recommended personal protection aids, see Subsection 8.2 ("Limiting exposure").
For recommended waste removal procedures, see Section 13 ("Removal instructions").

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

The product is produced and has to be used during its life cycle under strictly controlled conditions defined in Directive (EC) No. 1907/2006 REACH. In order to ensure safe handling, all of these conditions have to be complied with and the possibility of exposure of people and the environment has to thus be eliminated, with the exception of accidents or extraordinary events.

General safety and hygienic measures: Use it only in well ventilated areas with no ignition sources. Adopt measures that eliminate any possible static electricity discharge. Do not use compressed air for filling, emptying or other handling of the tanks. Do not forget that even empty packages can contain residues of flammable vapors and do not conduct activities, such as welding, cutting, grinding. etc., in their proximity. When entering enclosed areas that are not ventilated, always use protection of your airways.

Observe the personal hygiene rules. Immediately take off polluted parts of your clothing. Do not smoke, drink or eat while working! Thoroughly wash your hands and uncovered parts of your body by water and soap and, if necessary, apply a suitable reparation cream after work and before eating. Do not bring polluted clothes, footwear and protection equipment to eating areas.

7.2. Conditions for safe storage, including any incompatibilities

The product is produced and has to be used during its life cycle under strictly controlled conditions defined in Directive (EC) No. 1907/2006 REACH. In order to ensure safe storage, all of these conditions have to be complied with and the probability of exposure of people and the environment has to thus be eliminated, with the exception of accidents or extraordinary events. Storage packages have to be properly closed, marked and grounded. Do not store the product nearby incompatible materials, such as oxidation agents.

7.3. Specific end use(s)

The substance was registered as a transported isolated intermediate product, produced and used under strictly controlled conditions defined in Article 18(4) of Directive (EC) No. 1907/2006 REACH – see Section 16. That is why it must be handled in the specified manner.

Because of possible accidental leaks, the handling and storage areas and substance handling manners have to comply with the requirements for working with flammable substances that can potentially damage water and soil.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

8.1.1. Limit worksite exposure values

Government Directive No. 361/2007 Coll., which determines the occupational health protection conditions, as amended, specifies the following acceptable exposure limits (PEL) and the highest acceptable concentrations (NPK-P) of chemical substances in the air in the Czech Republic:

Name	CAS number	PEL [mg.m^{-3}]	NPK-P [mg.m^{-3}]	Note
Hydrocarbons, C_4; Petroleum gas	87741-01-3	no limit values for the given substances have been defined *it is recommended to comply with the limits specified for the components the substance contains:*		
components included in the substance	*NAME / CAS NUMBER:*	*PEL [mg.m^{-3}]*	*NPK-P [mg.m^{-3}]*	
	butadiene / 106-99-0	*2,2*	*4*	
Decomposition products:	*NAME / CAS NUMBER:*	*PEL [mg.m^{-3}]*	*NPK-P [mg.m^{-3}]*	
	Carbon monoxide / 630-08-0	*23*	*117*	

	Carbon dioxide / 124-38-9	*9 000*	*45 000*

Note 1: The meaning of the PEL and NPK-P abbreviations can be found in Section 16.
Note 2: The limit exposure values for the worksites throughout the EU countries are stated in Section 16.

8.1.2. DNEL/DMEL values
Pursuant to Article 2(8) of Directive (EC) No. 1907/2006 REACH, the obligation to assess chemical safety and to prepare a chemical safety report pursuant to Article 14 of this Directive does not apply to isolated intermediate products. That is why the MZP manufacturer has not specified the DNEL/DMEL values for this product.

8.1.3. PNEC values
Pursuant to Article 2(8) of Directive (EC) No. 1907/2006 REACH, the obligation to assess chemical safety and to prepare a chemical safety report pursuant to Article 14 of this Directive does not apply to isolated intermediate products. That is why the MZP manufacturer has not specified the PNEC values for this product.

8.1.4. Recommended procedure for monitoring concentrations at work environments
Recommended procedure for monitoring concentrations at work environments: gas chromatography (GC) with a flame ionization detector (FID) or mass spectrometric detector (MS) pursuant to technical standards ČSN EN 689 and ČSN EN 482.

8.2. Exposure controls

8.2.1. Technical protection measures for limiting exposure of people and of the environment
The product is produced and has to be used during its life cycle under strictly controlled conditions defined in Directive (EC) No. 1907/2006 REACH (see Section 16). Protection against undesirable exposure of people and of the environment has to be ensured by maintaining a strict control over the substance utilizing technical means and procedural and control technologies that reduce emissions and subsequent exposure with the objective to prevent release of the vapors into free space, penetration of the substance in water environments and soil and possible exposure of people. Areas where the substance is handled or stored have to be furnished with impermeable floors and catchment basins for accidental leaks of the substance.

8.2.2. Individual protective measures
Should there be a risk of an increased exposure while handling the product or should the exposure increase, for example, as a result of an accident or an extraordinary event, the employees have to have available personal protection equipment (PPE) for the protection of their airways, eyes, hands and skin, which correspond to the character of the conducted activities. They have to be also equipped with a suitable protection of their airways when the used technical means cannot guarantee compliance with the exposure limits specified for the given work environment or when the exposure of their airways could endanger their health. When using the protective equipment continuously while working, appropriate safety breaks have to be included, provided the character of the given PPE requires it. All PPE has to be continuously maintained in a usable condition. Should it become damaged or polluted, it has to be replaced immediately.

RECOMMENDED PERSONAL PROTECTION EQUIPMENT (PPE):
(particular types of the protective equipment have to be chosen based on the type of the conducted activity and based on the quantity and concentration of the given hazardous substance/mixture at the worksite)

- ***airways protection:*** protective mask that complies with EN 140 with a filter that is effective against the effects of low-boiling-point organic vapors leaks in the case of an extraordinary event; insulation breathing apparatus for rectifying the consequences of extraordinary events/accidents;
- ***eyes / face protection:*** protective goggles/shield that comply with EN 166;
- ***hands protection:*** protective gloves that protect against cold and possible frostbites; the following materials protect against the effects of the substance:

	glove material	*layer thickness*	*penetration time*
common work activity (staining possibility)	natural latex	1 mm	10 minutes
leak / accident repair	viton	0.7 mm	480 minutes

- ***protection of other body parts:*** antistatic and inflammable clothes, antistatic footwear;
- ***heat hazard:*** irrelevant when used as specified.

8.2.3. Limiting the exposure of the environment
Prevent product leaks to the environment by employing all available means. See Section 6.2.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

The information is taken from the registration dossier of substance (RD) unless otherwise stated.

CHARACTERISTIC	UNIT	VALUE	SOURCE	NOTE
Physical state		gas	RD	at 20°C; 101,3 kPa
Colour		colorless	RD	
Odour		odorless to aromatic	RD	
Odour threshold	[$mg.m^{-3}$]	information about the components included in the substance: *4,0 (1,3-butadiene)* *69 (1-butene)*	UAKRON	RD does not specify
Melting point/freezing point	[°C]	< -139 to -105.5	RD	
Boiling point or Initial boiling point / boiling range	[°C]	-161.48 to -0.5	RD	
Flammability (solid, gas, liquid)		extremely flammable	RD	
Upper flammability / explosive limits	[% vol.]	12	RD	
Lower flammability / explosive limits	[% vol.]	1,6	RD	
Flash point		-104 to -18	RD	CSR - DW
Auto-ignition temperature	[°C]	364-413	RD	
Decomposition temperature	[°C]	it does not disintegrate at normal temperatures when being used		RD does not specify
pH value		irrelevant		RD does not specify
Kinematic viscosity	[$mm^2.s^{-1}$]	irrelevant		RD does not specify
Solubility in water	[$mg.l^{-1}$]	135,6-792,3	RD	at 20-25 °C
Partition coefficient: n-octanol/water	[log Kow]	2,09-2,31	RD	at 20 °C
Vapour pressure	[kPa]	irrelevant		RD – DW/su
Relative density	Water = 1	irrelevant		RD – DW
Vapour density	air = 1	information about the components included in the substance: 1,87 *(1,3-butadiene)* *1,93 (1-butene)* *1,94 (isobutene)*	HSDB	RD does not specify
Particle characteristics		Irrelevant		Not applicable - this is a gas.

9.2. Other information

9.2.1. Information with regard to physical hazard classes

CHARACTERISTIC	UNIT	VALUE	SOURCE	NOTE
Explosive properties		the substance does not contain explosive components		RD - DW
Oxidising properties		none		RD - DW

9.2.2. Other safety characteristics

CHARACTERISTIC	UNIT	VALUE	SOURCE	NOTE
Evaporation rate		Irrelevant		RD does not specify
Dynamic viscosity		irrelevant		RD - DW

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

There is no risk of a hazardous reaction when the substance is used as an intermediate product and while stored and handled under strictly controlled conditions.

10.2. Chemical stability

The substance is chemically stable under normal temperatures when the substance is used as an intermediate product and while stored and handled under strictly controlled conditions.

10.3. Possibility of hazardous reactions

There is no risk of a hazardous chemical reaction when the substance is used as an intermediate product and while stored and handled under strictly controlled conditions.

10.4. Conditions to avoid

Ignition source (including static electricity), high temperature, sunlight.

10.5. Incompatible materials

Oxidation agents.

10.6. Hazardous decomposition products

Possible creation of carbon monoxide and carbon dioxide due to disintegration under high temperatures, for example, as a result of a fire.

SECTION 11: TOXICOLOGICAL INFORMATION

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

11.1.1. Toxicological effects of the substance

HAZARD CLASS	DATA FROM THE REGISTRATION DOCUMENTATION		EVALUATION
	DESCRIPTION	RESULT	
Acute toxicity	oral and dermal: inhalation:	unfeasible (Dw/nf) LC_{50} > 10,000 ppm	it does not comply with the classification criteria
Causticity / irritant effect for skin		no negative effects have been recorded	it does not comply with the classification criteria
Serious damage / eye irritation		no negative effects have been recorded	it does not comply with the classification criteria

HAZARD CLASS	DATA FROM THE REGISTRATION DOCUMENTATION		EVALUATION
	DESCRIPTION	RESULT	
Sensibility		scientifically unjustifiable (Dw/su)	it does not comply with the classification criteria
Mutagenicity in reproductive cells		positive test results; conclusion: the product containing ≥0.1% of 1,3-Butadiene can cause unfavorable genotoxic effects	it complies with the classification criteria (H 340)
Carcinogenicity		positive test results; conclusion: the product containing ≥0.1% of 1,3-Butadiene can cause cancer	it complies with the classification criteria (H 350)
Toxic for reproduction		no negative reproduction or development effects have been recorded	it does not comply with the classification criteria
STOT – one-time exposure	1/ oral and dermal: 2/ inhalation:	1/ unfeasible (Dw/nf) 2/ no toxic effects for up to 10,000 ppm	it does not comply with the classification criteria
STOT – repeated exposure	1/ oral OECD 407: 2/ inhalation: 3/ dermal:	1/ NOAEL(rat)=148.6 mg/kg 2/ NOAEC(rat)=1,000 ppm 3/ scientifically unjustifiable	it does not comply with the classification criteria
Inhalation hazard		when the product is ingested or when it enters the airways, it does not damage lungs and does not cause death	it does not comply with the classification criteria

11.1.2. Information about probable exposure ways

There is no explosion hazard when the substance is used as an intermediate product and while stored and handled under strictly controlled conditions. Inhalation can represent a significant exposure path during extraordinary events or accidents.

11.1.3. Symptoms and effects (acute, delayed and chronic after short-term as well as long-term exposure)

The product displaces oxygen. Lack of oxygen causes fatigue, sleepiness, faintness, dizziness, nausea, vomiting, loss of coordination, attention disorder, judgment errors, confusion. The victim does not have to be aware of the fact he/she is suffocating and can quickly fall unconscious and suffocate. Frostbites can occur upon contact with the cooled liquidized gas. Should frostbites occur, the frostbitten spots are pale, cold and insensitive; later on, they can redden, get swollen and the victim can feel tingling, burning and pain. The substance can cause hereditary genetic changes and it can also cause or support the origin of cancer in humans.

11.1.4. Interactive effects

No interactions occur if the product is used appropriately.

11.1.5. Toxicokinetics

Extensive metabolic transformation and detoxication occur upon inhalation exposure.

11.1.6. No particular data exist

Pursuant to Article 18(3) of Directive (EC) No. 1907/2006 REACH, only data pursuant to Appendix VII of this directive are stated for the transported isolated intermediate products over 1,000 t/year. The tests specified in Appendixes VIII through X do not have to be conducted.

11.2. Information on other hazards

The substance is not included in the candidate list pursuant to Article 59 (Paragraph 1) of the REACH Directive (due to the characteristics that can compromise endocrine activities or due to any other reason).

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

The product is a gas under standard pressure and temperature. When toxicity tests are conducted, it is technically difficult to maintain its specified concentration in water. The results of such tests may not then be relevant. That is why the tests were replaced by using a mathematical model method (Q)SAR.

Water environment	fish	LC_{50} (96 h, fish) = 19-147.54 mg/l	(Q)SAR
	invertebrates	EC_{50} (48 h, invertebrates) = 11-69.43 mg/l	(Q)SAR
	seaweed	ErC_{50} (96 h, seaweed) = 7.7-16.5 mg/l	(Q)SAR

Note: Significance of the LC_{50}, EC_{50} and ErC_{50} abbreviations is included in Section 16.

12.2. Persistence and degradability

Biodegradability: since the product is a gas under normal pressure and temperature, the standard biodegradability tests are technically difficult to conduct and the results may not be relevant. Application of the (Q)SAR method resulted in a conclusion that the product is not easily biodegradable.

12.3. Bioaccumulation potential

Since the value of the partition coefficient n-octanol/water (log Kow) is smaller than 3, product bioaccumulation is not expected.

12.4. Mobility in soil

Because of the value of the partition coefficient n-octanol/water (log Kow < 3), no product sorption to a sediment or soil is expected.

12.5. Results of PBT and vPvB assessment

Pursuant to Article 2(8) of Directive (EC) No. 1907/2006 REACH, the obligation to assess chemical safety and to prepare chemical safety report pursuant to Article 14 of this Directive does not apply to isolated products. That also means that it is not necessary to assess the PBT (P-persistent, B - bioaccumulative, T- toxic) and vPvB (vP - highly persistent, vB - highly bioaccumulative) characteristics. Nevertheless, considering the product characteristics, we can justifiably expect that the substance does not meet the criteria of the PBT or vPvB substances.

12.6. Endocrine disrupting properties

The substance is not included in the candidate list pursuant to Article 59 (Paragraph 1) of the REACH Directive due to the characteristics that can compromise endocrine activities.

12.7. Other adverse effects

Pursuant to Article 18(3) of Directive (EC) No. 1907/2006 REACH, only data pursuant to Appendix VII of this directive are stated for the transported isolated intermediate products over 1,000 t/year. The tests specified in Appendixes VIII through X do not have to be conducted.

Pursuant to Appendix 1 to Water Act No. 254/2001 Coll., the product is considered hazardous and harmful substance.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

No waste is incurred when the substance is used as an intermediate product and while stored and handled under strictly controlled conditions. In the event that it is necessary to dispose of the rest of the product (eg unused or leaked product), the applicable European Union legislation as well as applicable national and local regulations must be observed. Dispose of waste at a waste disposal facility.

Recommended waste classification pursuant to COMMISSION DECISION of 18 December 2014, amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council:

13.1.1. Catalogue number

The gases that are supplied in pressure bottles can not be included among waste and thus cannot be

assigned a catalogue number.

13.1.2. Recommended waste removal method
Incinerate the product residues designated for removal using a suitable burner and protection against reverse flare of the flame.

13.1.3. Recommended removal method of the polluted packages
Irrelevant. The product is not packaged, it is transported by road tankers.

13.1.4. Measures for limiting exposure when handling waste
Never discharge the unusable product residues to the environment. Doing so could create an explosive mixture with the air. Do not flush the liquidized product that leaked during an extraordinary event or accident to the sewerage system. Proceed in compliance with the instructions stated in Section 6 ("Accidental leak measures") and in Subsection 8.2 ("Limiting exposure") and comply with all valid legal regulations related to the protection of people, the air and water.

WARNING: *The stated information is of a recommendation character. It is related to the delivered, still unused material. Pursuant to the Waste Act all responsibilities for managing the waste, including its assignment based on its type and category, are responsibilities of the waste originator.*

SECTION 14: TRANSPORT INFORMATION

The product is transported by a pipeline as standard and it is thus not subject to the regulations related to road, water or air transport of hazardous goods.

In the case of transport by road (ADR), the following information applies to the transport of dangerous goods:

14.1. UN number or ID number	UN 1010
14.2. Official (UN) transport name	BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED
14.3. Transport hazard class/classes	2
14.4. Packaging group	-
14.5. Environmental hazard	-
14.6. Special safety measures for the users	-
14.7. Maritime transport in bulk according to IMO instruments:	the product is not designated for bulk transport pursuant to the International Maritime Organization (IMO) documents irrelevant

14.8. Other information

Hazard identification number:	239
Classification code:	2F
Labels:	2.1
Excepted quantities:	cannot be transported in the excepted quantity regime
Limited quantities:	cannot be transported in the limited quantity regime
Transport category:	2
Tunnel restriction code:	(B/D)

SECTION 15: REGULATORY INFORMATION

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

15.1.1 European Union
EP and Council (EC) Directive No. 1907/2006 (REACH), as amended

REGISTRATION (HEAD II OF THE REACH DIRECTIVE):
the product has been registered as a transported isolated intermediate product, produced and used under strictly controlled conditions
APPROVAL PROCESS (HEAD VII OF THE REACH DIRECTIVE)
pursuant to Article 2(8), isolated intermediate products are not subject to the approval obligation
LIMITATIONS (HEAD VIII OF THE REACH DIRECTIVE):
the limitations are complied with by determining the permitted usage manner

EP and Council (EC) Directive No. 1272/2008 (CLP), as amended
the product has been classified in compliance with the above stated directive; the obligations related to packaging and package marking of hazardous chemical substances apply to the product only if it is put on the market in packages that are subject to the marking obligation pursuant to Directive CLP

EP and Council (EC) Directive No. 649/2012 on exporting and importing hazardous chemical substances, as amended
the product is not subject to any special export or import limitations

15.1.2 Czech Republic

Act No. 350/2011 Coll. on Chemical Substances and Chemical Mixtures, as amended
the product is not subject to the obligation of notification to the PCN (Poison centres notification)
Act No. 258/2000 Coll., on Protection of Public Health, as amended
Act No. 254/2001 Coll., on Waters, as amended
Act No. 201/2012 Coll., on Air Protection, as amended
Act No. 541/2020 Coll., on Waste, as amended
Regulation No. 8/2021 Coll., on the Waste Catalogue and on Assessing Waste Characteristics, as amended
Government Directive No. 361/2007 Coll., which determines occupational health protection conditions, as amended
the product components have limit exposure values; the product is subject to the obligation to establish a controlled zone
Act No. 224/2015 Coll., on Prevention of Serious Accidents Caused by Selected Dangerous Chemicals or Chemical Mixtures, as amended

15.2 Chemical safety assessment

Pursuant to Article 2(8) of Directive (EC) No. 1907/2006 REACH, the obligation to assess chemical safety and to prepare a chemical safety report pursuant to Article 14 of this Directive does not apply to isolated intermediate products. That is why the manufacturer has not prepared any chemical safety report.
Information on the safe handling of the substance is incorporated into the body of the safety data sheet (section 1-16).

SECTION 16: OTHER INFORMATION

Changes made during the revision

01/12/2021: Revision (9): – Overall modification of the document in relation to the update of Appendix II of Directive (EC) No. 1907/2006 REACH, by Directive of the Council (EC) No. 2020/878;
29. 05. 2025 / 9(1): actualization of section 14;

Acronyms and abbreviations used in the text

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS	Registration number assigned to the substance by the Chemical Abstracts Service of the American Chemical Society
CLP	EU Directive No. 1272/2008 on Classification, Labeling and Packaging of chemical substances and mixtures, which is implemented into the European legislature by the means of GHS (United Nations´ Globally harmonized System) for classifying and labeling chemical substances
CMR	Carcinogenic, mutagenic or toxic for reproduction

ČSN EN (ISO)	European standard incorporated into the Czech technical standards
CSR	Chemical Safety Report
DMEL	Derived minimal effect level - an exposure level that corresponds to a low and possibly theoretical risk, which should be considered as an acceptable risk (for threshholdless effects, i.e. there is no exposure level without effect))
DNEL	Derived no-effect level - level of exposure derived from toxicological data that does not produce any adverse effects on human health
DW	Data waiving
EC_{50}	Effective concentration EC_{50} is the concentration of substance that causes immobilization of 50% of individuals
ErC_{50}	Effective concentration EC_{50} is the concentration of substance that causes 50 % decrease of Algea growth
ECHA	European Chemicals Agency
ES	Official number of the chemical substance in the European Union: EINECS from the European Inventory of Existing Commercial Substances, or ELINCS from the European List of Notified Chemical Substances, or NLP from the No Longer Polymer list
HSDB	Hazardous Substances Data Bank
IATA	International Air Transport Association
IBC	Intermediate Bulk Container
IC_{50}	Inhibition concentration IC_{50} that causes inhibition of 50% of individuals
ICAO	International Civil Aviation Organization
ICE	"Intervention in Chemical Transport Emergencies" system providing both professional and practical assistance in dealing with emergency situations related to the transport and storage of hazardous chemicals
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organisation
ISO	International Organization for Standardization
LC_{50}/LD_{50}	Lethal concentration/level is the concentration/level of substance that causes mortality of 50 % individuals
LOEC/LOEL	Lowest Observed Effect Concentration/Level
log Kow	Logarithm of distribution coefficient n-octanol/water
nf	Not feasible
NOAEC/NOAEL	No Observed Adverse Effect Concentration/No Observed Adverse Effect Level
NOEC/NOEL	No Observed Effect Concentration/No Observed Effect Level
NPK-P	The highest permitted concentration of the chemical substance in the air (the concentration of the substance that a worker may be exposed to for a maximum of 15 minutes but which must never be exceeded)
OECD	Organization for Economic Co-operation and Development
OOP	Recommended personal protective aids
OSN	United Nations
(Q)SAR	Quantitative Structure-Activity Relationship
PBT, vPvB	Persistent, bioaccumulative and toxic; high persistent and high bioaccumulative
PCN	Poison Centres Notification – international system for the notification of dangerous mixtures
PEL	Permitted exposure limit of the chemical substance in the air (the exposure value that an employee may be exposed to during the entire working shift (8 hours), without endangering his health during lifetime occupational exposure)
PNEC	Predicted No Effect Concentration
REACH	EU Directive No. 1907/2006 on Registration, Evaluation and Authorization of Chemicals
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
STOT	Specific Target Organ Toxicity
STP	Sewage treatment plant
su	Scientifically Unjustified

TRINS	Transport Information and Accident System of the Czech Republic, providing professional and practical assistance in dealing with emergency situations related to transport and storage of hazardous chemical substances, included in ICE
UACRON	Chemical database (The University of Akron).
UFI code	Unique identifier of the composition of the product containing the dangerous mixture (s).
UN	The four-digit identification number of the substance or object identifying hazardous material in international transport
UVCB	Substances of Unknown or Variable composition, Complex reaction products or Biological materials

Data sources used for preparing safety data sheets

Appendixes I, IV, VI and VII to Directive (EC) No. 1272/2008 CLP, as amended;
First aid principles upon exposure to chemical substances;
Registration documentation of the substances pursuant to Directive (EC) No. 1907/2006 REACH;
Decision of the European Agency for Chemical Substances ECHA No. SUB-D-2114120357-57-01/F on the registration pursuant to Directive (EC) No. 1907/2006 REACH;
Research data sources (Hazardous Substances Data Bank HSDB, University of Akron Chemical UAKRON, Gestis hygienic limits);

Currently valid H-sentences, EUH-sentences and hazardous class abbreviations stated in Section 2 a/or 3

H 220	Extremely flammable gas.
H 280	Contains pressurized gas; it can explode when heated.
H 340	Can cause genetic damages.
H 350	Can cause cancer.
Flam. Gas	Flammable gas
Press Gas	Gases under pressure
Carc.	Carcinogenicity
Muta	Mutagenicity in reproductive cells

Training instructions

People who handle the product have to be acquainted with the related handling risks and with the requirements related to the protection of health and of the environment (see the corresponding stipulations of the Labor Code).

Access to information

Pursuant to Article 35 of Directive (EC) No. 1907/2006 REACH, all employers have to allow access to the information stated on the safety data sheets to all employees who use the given product or who are exposed to its effects while working, as well as to representatives of these employees.

Strictly controlled conditions

They are such technological processes and work conditions that ensure that the product emissions into the environment as well as the subsequent exposure of the employees are minimized during the entire life cycle of the intermediate product (i.e., from the moment of its production until it is transformed to another substance). These conditions for intermediate products, isolated on-the-spot, are defined in Article 18(4) of Directive (EC) No. 1907/2006 REACH:

- the substance is kept strictly under control using technical means during its entire life cycle,
- procedural and control technologies are used for reducing its emissions and subsequent exposure,
- only properly trained and authorized personnel can handle the substance,
- activities, such as rinsing and washing, are conducted prior to opening and entering the given technological area for the purpose of cleaning, maintenance or inspection,
- procedural and control technologies are used when accidents occur and when waste is created - these technologies reduce emissions and subsequent exposure when cleaning the product or during cleaning and maintenance procedures,
- substance handling procedures are appropriately documented and thoroughly controlled by the operator.

Limit worksite exposure values for the EU countries (see Point 8.1.1.)

information about hydrocarbons, C_4; petroleum gas (CAS number 87741-01-3)

Name	Country	8-hour limit [mg.m^{-3}]	short-term limit [mg.m^{-3}]
Hydrocarbons, C_4; Petroleum gas	European Union (Regulation 2000/39/ES as amended)	no limit values for the given substance itself or for the components in the substance have been defined	
components included in this UVCB substance / CAS:		*8-hour limit [mg.m^{-3}]*	*short-term limit [mg.m^{-3}]*
butadien / 106-99-0		*2,2*	-

8-hour limit: *measured and calculated value in relation to an eight-hour reference period as a time-weighted average*
short-term limit: *exposure limit value, which should not be exceeded and which corresponds to 15 minutes*

Emergency phone numbers for the EU countries (see Section 1.4.)

Nationale centers (PCCS)	TELEPHON	LANGUAGE	web
Great Britain	☎ 8448920111	English	☎+44/123 5836002; 5753363
Belgium	☎+32/70245245	French	http://www.centreantipoisons.be
	☎+32/70245245	Dutch	http://www.antigifcentrum.be
	☎+32/70245245	German	http://www.poisoncentre.be
Bulgaria	☎+359/29154411	Bulgarian	https://pirogov.eu/bg
Croatia	☎+385/12348342	Croatian	https://www.imi.hr/en/jedinica/poison-control-centre
Denmark	☎+45/82121212	Danish	https://www.bispebjerghospital.dk/giftlinien
Estonia	☎+372/7943794	Estonian	https://www.16662.ee
Finland	☎+358/9471977	Finnish	http://www.hus.fi/sairaanhoito/sairaanhoitopalvelut/myrkytystietokeskus/Sivut/default.aspx
France - Angers	☎+33/241482121	French	http://www.centres-antipoison.net/angers/index.html
France - Bordeaux	☎+33/556964080	French	http://www.centres-antipoison.net/bordeaux/index.html
France - Lille	☎+33/0800595959	French	http://www.centres-antipoison.net/lille/index.html
France - Lyon	☎+33/472116911	French	http://www.centres-antipoison.net/lyon/index.html
France - Marseille	☎+33/491752525	French	http://www.centres-antipoison.net/marseille/index.html
France - Nancy	☎+33/383225050	French	http://www.centres-antipoison.net/nancy/index.html
France - Paris	☎+33/140054848	French	http://www.centres-antipoison.net/paris/index.html
France - Strasbourg	☎+33/388373737	French	http://www.centres-antipoison.net/strasbourg/index.html
France - Toulouse	☎+33/561777447	French	http://www.centres-antipoison.net/toulouse/index.html
Ireland	☎+353/18092166	English	http://www.poisons.ie/Public
Italy - Bergamo	☎+39/800883300	Italian	http://www.asst-pg23.it/section/259/Tossicologia_-_Centro_antiveleni
Italy - Firenze	☎+39/557947819	Italian	http://www.antiveleni.altervista.org
Italy - Milano	☎+39/266101029	Italian	http://www.centroantiveleni.org
Italy - Pavia	☎+39/38224444	Italian	http://www-3.unipv.it/reumatologia-tossicologia/cav
Italy - Napoli	☎+39/817472870	Italian	
Italy - Foggia	☎+39/881732326	Italian	
Italy - Roma	☎+39/668593726, 39/649978000, 39/63054343	Italian	http://www.corso-primo-soccorso-roma.it/centriantiveleno-lazio.html
Lithuania	☎+370/52362052	Lithuanian	http://www.apsinuodijau.lt
Latvia	☎+371/67000610	Latvian	https://www.aslimnica.lv/lv
Luxembourg	☎+49/80025500	German	http://www.poisoncentre.be
	☎+352/80025500	French	http://www.centreantipoisons.be
Hungary	☎+36/680201199, 36/0614766464	Hungarian	http://www.okbi.hu/page.php?trid=1&dz=103
Germany - Berlin	☎+49/3019240	German	https://giftnotruf.charite.de
Germany - Bonn	☎+49/22819240	German	http://www.gizbonn.de/index.php?id=272
Germany - Erfurt	☎+49/361730730	German	https://www.ggiz-erfurt.de/home.html

Germany - Freiburg		☎+49/76119240	German	https://www.uniklinik-freiburg.de/giftberatung.html
Germany - Göttingen		☎+49/55119240	German	https://www.giz-nord.de/cms/index.php
Germany – Homburg/Saar		☎+49/684119240	German	http://www.uniklinikum-saarland.de/de/einrichtungen/kliniken_institute/kinder_und_jugendmedizin/informations_und_behandlungszentrum_fuer_vergiftungen_des_saarlandes
Germany – Mainz		☎+49/613119240	German	http://www.giftinfo.uni-mainz.de/index.php?id=24807
Germany - München		☎+49/8919240	German	http://www.toxinfo.med.tum.de
Netherlands		☎+31/31887558561	Dutch	http://www.productnotification.nl/
Poland - Kraków		☎+48/124119999	Polish	http://www.oit.cm.uj.edu.pl
Poland – Gdansk		☎+48/586820404	Polish	http://www.pctox.pl/news.php
Poland – Poznaň		☎+48/618476946	Polish	http://www.raszeja.poznan.pl/oddzialy/oddzialtoksykologiczny
Poland - Warszawa		☎+48/607218174	Polish	okzit@burdpi.pol.pl
Portugal		☎+351/808250143	Portuguese	http://www.inem.pt
Austria		☎+43/14064343	German	http://www.goeg.at/de/VIZ
Greece		☎+30/2132009000	Greek	http://www.aglaiakyriakou.gr/; http://0317.syzefxis.gov.gr
Romania		☎+40/213183606, 215992300, 265212111	Romanian	spital@urgentafloreasca.ro secretariat@spitjudms.ro infotox@insp.gov.ro
Slovakia		☎+421/254774166	Slovak	http://www.ntic.sk
Slovenia		☎+386/15221293	Slovenian	www.kclj.si
Spain		☎+34/915620420	Spanish	https://www.administraciondejusticia.gob.es/paj/publico/ciudadano/informacion_institucional/organismos/instituto_nacional_de_toxicologia_y_ciencias_forenses/servicios/info_toxicologica/que_es_sit/!ut/p/c5/04_SB8K8xLLM9MSSzPy8xBz9CP0os3g_A1cjCyd-DRwMDUwNLA08nwzAvM0czA_8gM6B8pFm8maerqWdQsImJcaiLiYGncViYa4CHr4GBiQExug1wAEd-CusNBrsWpwsLUACKPy3WuRvjlg83wy5sQ0G8CtR-P__w88nNT9QtyQyMMMj0zA9IVFQHY18l4/dl3/d3/L2dJQSEvUUt3QS9ZQnZ3LzZfTjBFMjhCMUEwMDUwOTBJQjFWSjZBNjBPTjA!/?itemId=45381
Sweden		☎+46/104566700	Swedish	https://giftinformation.se

Declaration: *The safety data sheet has been prepared in compliance with Directive (EC) No. 1907/2006 REACH. It contains information that is necessary for ensuring occupational health and safety and protection of the environment. This information has been stated in good spirits, it corresponds to the current level of knowledge and experience and complies with our valid legal regulations. The stated information does not replace the corresponding qualitative specification and it cannot be considered a guarantee of suitability and usability of this product for a particular application. It is the responsibility of the product user to assess accuracy of the information for particular applications, during which the product characteristics can be influenced by various factors. The consumer is responsible for complying with the valid regional legal regulations.*

ANNEX OF MATERIAL SAFETY DATA SHEET

EXPOSURE SCENARIOS PURSUANT TO ARTICLE 31 OF DIRECTIVE OF THE EUROPEAN PARLIAMENT AND COUNCIL (EC) NO. 1907/2006 (REACH)

Exposure scenarios for isolated intermediate products used under strictly controlled conditions are not required.