

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**1.1 Product identifier**

- Trade name: **ETHYLENE FOR POLYMERIZATION**
- Chemical name: Ethylene
- Registration number REACH: 01-2119462827-27-0036
- UFI code: irrelevant for substances
- Index number: 601-010-00-3
- CAS number: 74-85-1
- EC number: 200-815-3

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

1.2.1 Identified uses

Monomer for the production of polymers, intermediate product for the production of chemical substances, technical gas for welding, cutting, etc., component for the preparation of mixtures - e.g. calibration gases.

1.2.2 Non-recommended uses

There are no non-recommended uses stated in the registration. The product may not be used in any way other than that specified in point 1.2.1 or subsection 7.3.

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

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Other contacts:

- Director of the Monomers and Chemicals Unit: ☎: +48 242 566 615; e-mail: Dorota.Smolarek@orlen.pl
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- 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

- 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)
e-mail: tis@vfn.cz
- Transport Information & Accident System (TRINS) ☎: +420 476 163 111 (NON STOP)

Note: Emergency telephone numbers for EU countries are listed in section 16.

SECTION 2: HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture**

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

(A) Refrigerated liquefied product with temperatures approx. -93 to -82°C

FLAMMABLE GAS, CATEGORY 1A	Flam. Gas 1A, H 220
GASES UNDER PRESSURE (REFRIGERATED LIQUEFIED GAS)	Press. gas (Refrigerated liquefied gas), H 281
SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE, CATEGORY 3	STOT SE 3, H 336

ETHYLENE

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006 (REACH), as amended

Valid Issue: 30/11/2021 – version 10

Revision: 30/11/2021 – 10th issue
replaces: 18/12/2020 – 9th issue
issued on: 07/13/2004


(B) Compressed liquefied product with pressure 1.2-1.4 MPa (long-distance pipelines)

FLAMMABLE GAS, CATEGORY 1A	Flam. Gas 1A, H 220
GASES UNDER PRESSURE (COMPRESSED GAS)	Press. gas (Compressed gas), H 280
SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE, CATEGORY 3	STOT SE 3, H 336

Note: The full text of the H-sentence and / or EUH-sentences is stated in Section 16.




2.2 Label elements

(A) Refrigerated liquefied product with temperatures approx. -93 to -82°C

<i>Product identifiers</i>	<p align="center">ETHYLENE FOR POLYMERIZATION ETHEN / ETHYLENE index number: 601-010-00-3</p>	
<i>Warning hazard symbol</i>		
<i>Signal word</i>	DANGER	
<i>H-phrases (standard hazard phrases)</i>	H220 H281 H336	Extremely flammable gas. Contains refrigerated gas; may cause cryogenic burns or injury. May cause drowsiness or dizziness.
<i>P-statements (precautionary statements)</i>	P210 P243 P261 P377 P381 P304+P340 P410+403	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take action to prevent static discharges. Avoid breathing gas. Leaking gas fire – do not extinguish, unless leak can be stopped safely. In case of leakage, eliminate all ignition sources. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Protect from sunlight. Store in a well-ventilated place.
<i>Additional information</i>	None	
	<p align="center">ORLEN Unipetrol RPA s.r.o. Záluží 1, 436 70 Litvínov, Czech Republic ☎: +420 476 161 111, +420 476 163 111</p>	

(B) Compressed liquefied product with pressure 1.2-1.4 MPa (long-distance pipelines)

<i>Product identifiers</i>	<p align="center">ETHYLENE FOR POLYMERIZATION ETHEN / ETHYLENE index number: 601-010-00-3</p>
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Warning hazard symbol		  
Signal word		DANGER
H-phrases (standard hazard phrases)	H220 H280 H336	Extremely flammable gas. Contains gas under pressure; may explode if heated. May cause drowsiness or dizziness.
P-statements (precautionary statements)	P210 P243 P261 P377 P381 P304+P340 P410+P403	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take action to prevent static discharges. Avoid breathing gas. Leaking gas fire – do not extinguish, unless leak can be stopped safely. In case of leakage, eliminate all ignition sources. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Protect from sunlight. Store in a well-ventilated place.
Additional information		None
<p>ORLEN Unipetrol RPA s.r.o. Záluží 1, 436 70 Litvínov, Czech Republic ☎: +420 476 161 111, +420 476 163 111</p>		

2.3 Other hazards

The product is easily flammable compressed or refrigerated liquefied gas. Liquefied product vaporizes quickly and may cause frostbites. Leaked gas spreads to long distances and creates explosive mixtures with air; after the product initiation it may cause fire or explosion even far from the leak source. Ethylene displaces oxygen in the air and may cause suffocation.

Produkt does not meet the criteria for PBT (P-persistent, B-bioaccumulative, T-toxic) or vPvB (vP-very persistent, vB-very bioaccumulative) substances. Product assessments for PBT / vPvB criteria see Subsection 12.5 ("Results of PBT and vPvB assessment").

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

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Name of the substance:	ETHYLENE
Concentration [% hm.] :	min. 99.9
Index number (index):	601-010-00-3
CAS number:	74-85-1
EC number:	200-815-3

IMPURITIES

NAME:

IDENTIFIER :

The product does not contain any impurities, stabilizing additives or other components, which would have an impact on its classification.

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

Note: Specific concentration limits (SCL), M-factor (M-) and Acute toxicity estimate (ATE) were not determined for this substance (harmonized 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 providing first aid pay attention to self-protection.

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 When inhaled

If possible with respect to your own safety, move the victim to fresh air and make sure they do not get cold. Ensure specialized medical help.

4.1.3 Skin contact

In case of frostbite do not pull off adherent clothing and wash the place with water (not warm). Do not rub the affected area, only cover it with sterile bandage or clean piece of cloth. Ensure specialized medical help.

4.1.4 Contact with eyes

Immediately start washing eyes while wide open under flowing tepid water, continue for at least 15 minutes. If the patient has contact lenses, remove them before washing eyes. Protect unharmed eye. Ensure specialized medical help; in case of eye contact with liquefied gas immediately, as there may be serious eye damage when freezing.

4.1.5 When ingested

Consumption is not a probable way of exposure. Contact with liquefied gas may cause frostbites of lips and mouth. In such case wash your mouth with luke water and ensure specialized medical help immediately.

4.2 Most important symptoms and effects, both acute and delayed

Lack of oxygen may cause exhaustion, drowsiness, weariness, dizziness, nausea, vomiting, loss of coordination, problems with attention and reasoning, and general confusion. The victim may not even notice he is suffocating, and may fall unconscious and suffocate quickly without warning. In case of frostbite the affected areas appear pale, cold and insensitive, and may later change to red, swell, tingle, burn and hurt.

4.3 Indication of any immediate medical attention and special treatment needed

Immediate medical help is required in case of inhalation or eye contact with liquefied gas.

SECTION 5: FIREFIGHTING MEASURES**5.1 Extinguishing media**

Appropriate extinguishing media: low expansion foam, spray or water fog.

Inappropriate extinguishing media: direct water stream.

Extinguishing small fire: dry-powder or carbon dioxide (CO₂) extinguisher, dry sand or extinguishing foam.

5.2 Special hazards arising from the substance or mixture

Do not fight the fire until the source of its leak is removed. If this is not possible, let the fire burn out and only use water to cool the tanks near the fire. Otherwise there is a danger of a fast reaction or explosion. The gases may spread to significant distances and in contact with a source of ignition may cause back-up with subsequent explosion and / or fire. A cold mist forms from evaporation of the liquefied product. The mist accumulates near

the ground and in enclosed areas, and may cause explosion and suffocation. Tanks containing the product can explode due to heat. Burning may cause the creation of toxic fumes containing carbon monoxide and carbon dioxide. Leaked refrigerated liquefied gas may create ice, which can create obstructions in sewage and freeze vents.

5.3 Advice for firefighters

Minimize the penetration of extinguishing medium contaminated by the substance into the sewage, surface or underground waters or into the soil. There is a danger of explosion and subsequent fire in case of a leak into the sewage.

Use water spray to keep the containers cool in order to prevent an explosion caused by the heat.

Do not use foam and water at the same time because water dissolves the foam.

Water contact with cooled liquefied gas can lead to significant foaming and quick creation of gases.

Protective equipment for fire fighters: full protective gear and self-contained close-circuit breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Enclose the place and prevent the access to the area in danger. Remain on the windward side. There is a danger of fire in case of accidental release of this substance, therefore remove all possible ignition sources, do not smoke and do not manipulate with open fire. If possible, ensure a sufficient ventilation of enclosed spaces. Prevent contact with the substance and its vapors. Use proper personal protective equipment (as indicated in Subsection 8.2) when removing the effects of the emergency event/accident. Evacuate people from the whole area in danger for large accidents. There is a danger of suffocation and in case of initiation also of explosion in areas below ground and in enclosed areas (including sewage). Leaked refrigerated liquefied gas may create ice, which can create obstructions in sewage and freeze vents.

6.2 Environmental precautions

Prevent further leaking and enclose the leaking place. In the case of leak of liquefied gas, prevent its escape into the sewage system or into surface and underground water by closing sewage entrances.

6.3 Methods and material for containment and cleaning up

Leak of liquefied gas will cause quick evaporation with no efficient way of stopping it. Use a water shower to reduce the amount of gases in the air. Increase the intensity of air ventilation at the site of the leak, especially if it occurred in an enclosed area, and monitor the concentration of gases in the air.

For large leaks into water use floating barrage and collect the substance from surface using surface skimmers (separators) or cover the leaked substance with sorbent and remove saturated sorbent from the surface by scraping or draining. Consult a professional before using dispersing agents.

6.4 Reference to other

For recommended personal protective aids – see Subsection 8.2 (“Exposure controls”).

For recommended manner of removing waste – see Section 13 (“Disposal considerations”).

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Adhere to all fire safety precautions (no smoking, no open fire, removal of all possible combustion sources) and stay in well-ventilated areas when manipulating with the substance and with empty tanks (may contain residue). Do not perform activities such as welding, cutting, grinding etc. near casings (even empty ones). Prevent bolts of static electricity. Only use in technological plants which are made of suitable construction materials, can withstand the appropriate pressure and are equipped with a protective mechanism which would prevent back-flow. Ensure that the whole gas system was inspected for possible leaks before use. Use recommended personal protective measures and follow all instructions to prevent possible contact of the substance with skin, eyes and possible inhalation. When entering enclosed or non-ventilated areas always use airway protective measures.

General sanitary precautions: Please keep the rules of personal hygiene. Take off contaminated pieces of clothing. Do not eat, drink or smoke during work! Wash your hands and exposed parts of body thoroughly with

soap and water after work and before meal and possibly treat with suitable reparation lotion. Do not wear contaminated clothing, shoes or protective equipment in the catering area.

7.2 Conditions for safe storage, including any incompatibilities

Storage must adhere to the fire safety requirements on buildings and electric equipment must adhere to valid regulations. Store in cool, well-ventilated places with efficient suction from all heat and combustion sources. Protect from direct sunlight. Storage containers must be closed, properly labeled and grounded. Do not store near incompatible materials, such as oxidizers.

7.3 Specific end use(s)

The substance is intended for specific use as a monomer. Further as intermediate product for the production of chemical substances, technical gas for welding, cutting, etc., component for the preparation of mixtures - e.g. calibration gases.

All conditions for safe use are described directly in the relevant sections of the safety data sheet itself.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational exposure limit values

The following Permissible Exposure Limits (PELs) and Maximum Allowable Concentrations (NPK-P) of Chemicals in the Atmosphere of Workplaces within the Czech Republic are set by the Government Regulation No. 361/2007 Coll., determining conditions of occupational health protection, as amended:

Name	CAS number	PEL [mg.m ⁻³]	NPK-P [mg.m ⁻³]	Note
Ethylene	74-85-1	Limit values for the substance have not been determined		
<i>Decomposition products:</i>	<i>NAME / CAS NUMBER:</i>	<i>PEL [mg.m⁻³]</i>	<i>NPK-P [mg.m⁻³]</i>	
	<i>Carbon monoxide / 630-08-0</i>	<i>23</i>	<i>117</i>	
	<i>Carbon dioxide / 124-38-9</i>	<i>9 000</i>	<i>45 000</i>	

Note 1: An explanation of the meaning of the PEL and NPK-P abbreviations is in section 16.

Note 2: Occupational exposure limit values for EU countries are listed in section 16.

8.1.2 DNEL/DMEL values

The DNEL / DMEL was not established because no risk to human health was identified.

8.1.3 PNEC values

PNECs were not established because no risk was identified for any of the environmental compartments.

8.1.4 Recommended monitoring of the concentration in the workplace

Gas chromatography (GC) with a flame ionizing detector (FID) or a mass spectrometer (MS) in accordance with technical norms ČSN EN 689 and ČSN EN 482.

8.2 Exposure control

8.2.1 Technical protective measures for limiting the exposure of people and the environment

Exposure control of unwanted exposure of humans and the environment must be ensured by strictly keeping the substance under control by using process and control technologies, which reduce emissions and subsequent exposure with the goal of preventing the substance from entering the air and water systems as well as the soil, and of preventing possible human exposure. The areas where the substance is stored and manipulated must be equipped with impermeable floors and retaining tanks in case of emergency leaks. It is necessary to ensure global as well as local ventilation and efficient suction.

8.2.2 Individual protective measures

If an accident or extraordinary event causes increased exposure, employees must have access to personal protective measures (PPM) for the protection of airways, eyes, hands and skin, depending on the nature of the performed activities. Suitable protection for airways must also be available where it is not technically possible to ensure the adherence of exposition limits identified for the work environment or ensure that exposure via airways will not affect the health of people. During non-stop use of these

measures during permanent work, it is necessary to include safety breaks if the nature of the PPM requires them. All PPM need to be kept in usable condition and damaged or contaminated ones need to be immediately replaced.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE):

(the specific type of protective equipment must be chosen according to the type of activity being carried out and the quantity and concentration of the dangerous substance / mixture at the workplace)

- *Respiratory protection:* Use the insulation breathing apparatus use in case of insufficient ventilation and / or local exhaustion and product leakage;
- *Eye/face protection:* Protective chemical goggles compliant with EN 166 or protective face shield;
- *Hand protection:* Protective gloves against cold and possible frostbite; the follow materials protect from the chemical effects of the substance:

	<i>Glove material</i>	<i>Material thickness</i>	<i>Penetration time</i>
Regular work activities (staining risk)	nitrile	0.4 mm	60 minutes
Leak / accident liquidation	Viton	0.7 mm	480 minutes

- *Protection of other body parts:* Antistatic, inflammable protective clothes, antistatic shoes;
- *Thermal risk:* Not relevant for the given manner of the use.

8.2.3 Environmental exposure controls

Avoid product leakage to the environment with 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 (CSR) unless otherwise stated.

CHARACTERISTIC	UNIT	VALUE	SOURCE	NOTE
Physical state		Gas	CSR	at 20°C; 101,3 kPa
Colour		Colorless	CSR	
Odour		Sweet	HSDB	
Odour threshold	[ppm]	260	UAKRON	
Melting point/freezing point	[°C]	-169.15	CSR	
Boiling point or Initial boiling point / boiling range	[°C]	-103.77	CSR	
Flammability (solid, gas, liquid)		Extremely flammable	CSR	
Upper flammability / explosive limits	[% obj]	36	CSR	
Lower flammability / explosive limits	[% obj]	2.7	CSR	
Flash point	[°C]	Irrelevant		CSR - DW
Auto-ignition temperature	[°C]	450	CSR	
Decomposition temperature	[°C]	Does not decompose at normal usage temperatures		CSR does not specify
pH value		Irrelevant		CSR does not specify
Kinematic viscosity	[mm ² /s]	-		CSR does not specify
Solubility in water	[mg.l ⁻¹]	131	CSR	at 25°C
Partition coefficient: n-octanol/water	[log Kow]	1.13	CSR	at 25°C

CHARACTERISTIC	UNIT	VALUE	SOURCE	NOTE
Vapour pressure	[hPa]	2124	CSR	at -90°C
Density	[g.cm ⁻³]	0.5678	CSR	at -104°C
Relative density	Water=1	-		CSR does not specify
Vapour density	Air=1	0.978	HSDB	CSR 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		Substance is not explosive		CSR - DW
Oxidising properties		None		CSR - DW

9.2.2 Other safety characteristics

CHARACTERISTIC	UNIT	VALUE	SOURCE	NOTE
Evaporation rate		Irrelevant		CSR - DW
Dynamic viscosity	[μP]	10.4	CSR	at 25°C

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

No risk assuming adherence to the conditions for manipulation and storage listed in Section 7 The product can polymerize at temperatures exceeding 600°C, and in the presence of catalyzer substances the polymerization temperature can drop lower (e.g. copper allows polymerization at 400°C).

10.2 Chemical stability

The product is chemically stable assuming storage and manipulation under the conditions listed in Section 7.

10.3 Possibility of hazardous reactions

Polymerization can occur at higher temperatures. Dangerous reactions occur after contact with oxidizers.

10.4 Conditions to avoid

Ignition sources (including static energy), high temperature, sunshine.

10.5 Incompatible materials

Oxidizers.

10.6 Hazardous decomposition products

Carbon monoxide and carbon dioxide might be produced during heat decomposition at high temperatures.

SECTION 11: TOXIKOLOGICAL 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 REGISTRATION DOCUMENTATION		EVALUATION
	DESCRIPTION	RESULT	
Acute toxicity	1/ Oral and Dermal: 2/ Inhalation:	1/ Not feasible (Dw/nf) 2/ LC ₅₀ > 57 000ppm	Does not meet the classification criteria

HAZARD CLASS	DATA FROM REGISTRATION DOCUMENTATION		EVALUATION
	DESCRIPTION	RESULT	
Skin corrosion/irritation		Not feasible (Dw/nf)	Does not meet the classification criteria
Serious eye damage/irritation		Not feasible (Dw/nf)	Does not meet the classification criteria
Sensitisation		Not feasible (Dw/nf)	Does not meet the classification criteria
Germ cell mutagenicity	1/ OECD 471 (in vitro): 2/ in vivo:	1/ No effects 2/ No effects (NOAEC=10 000ppm)	Does not meet the classification criteria
Carcinogenicity	OECD 453	No effects were noted	Does not meet the classification criteria
Reproductive toxicity	1/ OECD 421 fertility tests 2/ developmental toxicity tests	1/ No effects 2/ No effects (NOAEC=5 000ppm)	Does not meet the classification criteria
STOT-single exposure	1/ Oral and Dermal: 2/ Inhalation:	1/ Not feasible (Dw/nf) 2/ To 57000ppm no toxic effects	Does not meet the classification criteria
STOT-repeated exposure	1/ Oral and Dermal: 2/ Inhalation: OECD 413 (10 000 ppm, 13 weeks):	1/ Not feasible (Dw/nf) 2/ No effects (NOAEC=10 000ppm; LOEC=300ppm)	Does not meet the classification criteria
Aspiration hazard		If swallowed and when entering into the respiratory system, does not cause lung damage or cause death	Does not meet the classification criteria

11.1.2 Information on likely routes of exposure

Inhalation is the most significant type of exposure.

11.1.3 Delayed and immediate effects as well as chronic effects from short and long-term exposure

The product displaces oxygen. Lack of oxygen may cause exhaustion, drowsiness, weariness, dizziness, nausea, vomiting, loss of coordination, problems with attention and reasoning, and general confusion. The victim may not even notice he is suffocating, and may fall unconscious and suffocate quickly without warning. Frostbites may develop from contact with cooled liquefied gas. Frostbitten areas appear pale, cold and insensitive, and may later change to red, swell, tingle, burn and hurt.

The product itself could also cause sleepiness and dizziness, however these narcotic effects only occur at very high concentrations of circa 80% volume, which highly exceed the values of work exposure.

11.1.4 Interactive effects

There are no interactions for identified use.

11.1.5 Toxicokinetics

The product is metabolized and detoxicated very quickly after inhalation.

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

Ethylene forms a gas under normal pressures and temperatures, and during toxicity testing it is technically difficult to keep its designated concentration in water, as was shown in tests performed on seaweed and algae.

Thus, the results of such tests might not be relevant. For this reason the tests were replaced by the (Q)SAR mathematical model method.

Water environment	Fish	LC ₅₀ (96 h) = 126.012 mg/l	(Q)SAR
		NOEC (30 d) = 12.385 mg/l	(Q)SAR
	Invertebrates	EC ₅₀ (48 h) = 62.48 mg/l	(Q)SAR
		NOEC = 6.31 mg/l	(Q)SAR
	Algae	ErC ₅₀ (96 h) = 30.32 mg/l	(Q)SAR
		ErC ₅₀ (72 h) = 40.5-72.2 mg/l	(Q)SAR
Terrestrial environment	Soil organisms	LC ₅₀ (14d, earthworms) = 60.037 mg/l	(Q)SAR
Microbiological activity (STP)	Activated sludge	the test is not necessary since microbial toxicity is not probably (the product is a gas and will segment to the air at normal temperature and pressure)	

Note: An explanation of the meaning of the LC₅₀, EC₅₀, ErC₅₀, NOEC abbreviations is in section 16.

12.2 Persistence and degradability

Biological degradability: due to the fact that ethylene forms a gas under normal temperature and pressure, standard biodegradability tests are technically difficult to perform and the results might not be relevant. The (Q)SAR method has led to the conclusion that ethylene is well bio-degradable.

Abiotic degradability:

- hydrolysis as a function of pH: the product is unaffected by hydrolysis
- photolysis: the product is unaffected by photolysis
- atmospheric oxidation: easy decomposition is assumed via indirect photolysis in the air

12.3 Bioaccumulative potential

With regards to the fact that the value of the distribution coefficient n-octanol/water (log Kow) is lower than 3, no bioaccumulation of the product is expected.

12.4 Mobility in soil

With regards to low value of the distribution coefficient n-octane/water (low Kow < 3) no sorption of the product into sediment or soil is expected.

12.5 Results of PBT and vPvB assessment

The product does not fulfill the criteria of persistence, bioaccumulation and toxicity, or the criteria of high persistence and high bioaccumulation in accordance with Annex XIII of EC Regulation No 1907/2006 REACH, and so is not identified as a PBT substance (Persistent, Bioaccumulative, Toxic) or a vPvB (very Persistent, very Bioaccumulative) substance.

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 Appendix 1 of the Water Act No. 254/2001 Coll., the product is not considered a hazardous and harmful substance.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

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 according to Decree No. 8/2021 Coll., On the Waste Catalog and assessment of waste properties.

13.1.1 Catalogue number

Gases, which are not delivered in pressurized bottles, cannot be put in waste and assigned a number in accordance with the catalogue.

13.1.2 Recommended waste removal method

Burn the unusable remainder of the product with a suitable burner equipped with protection against flame blow-back.

13.1.3 Recommended methods of contaminated containers disposal

Not relevant. The product is not packed, it is transported via piping and tank cars.

13.1.4 Measures for limiting exposure when handling waste

Never release the rest of the product to be disposed into an environment where an explosive mixture with air could form. Do not flush leaked cooled liquefied product during an emergency event or accident into sewage. Proceed in accordance with instructions provided in Section 6 („Accidental release measures“) and in Subsection 8.2 („Limiting exposure“) and adhere to all valid legal regulations for the protection of people, 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

Pressurized ethylene is transported by pipes and thus is not adjusted by regulations for land, water or air transportation of dangerous items.

Refrigerated liquefied ethylene is transported by tank cars. The listed information applies to road transport (ADR) and rail (RID) transport of dangerous goods:

- 14.1 UN number or ID number:** 1038
14.2 UN proper shipping name: ETHYLENE, DEEP COOLED, LIQUID
14.3 Transport hazard class(es): 2
14.4 Packing group: not listed
14.5 Environmental hazards: the product is not harmful to the environment
14.6 Special precautions for user: none
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

14.8 Other information

- Hazard identification number: 223
Classification code: 3F
Labels: 2.1 + (13)*

Note: *Safety sign for displacement „move with care“ (only valid for RID)

**SECTION 15: REGULATORY INFORMATION****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****15.1.1 European Union**

Regulation of the European Parliament and Council (EC) No. 1907/2006 (REACH), as amended

REGISTRATION (TITLE II OF THE REACH REGULATION)

the product was fully registered as a substance

AUTORISATION (TITLE VII OF THE REACH REGULATION)

the product is not listed in the list of substances in Annex XIV of EC Regulation No 1907/2006 REACH, and so no licensing obligation applies

RESTRICTION (TITLE VIII OF THE REACH REGULATION)

the product shall not be used in aerosol dispensers for amusement and decorative purposes intended for sale to the public(annex XVII, point 40)

Regulation of the European Parliament and Council (EC) No. 1272/2008 (CLP), as amended

the product has been classified in compliance with the stated regulation, packaging and labeling obligations of dangerous chemicals only apply to the product if it is marketed in packaging subject to its labelling according to CLP regulation

Regulation of the European Parliament and Council (EC) No. 649/2012 on the export and import of dangerous chemicals, as amended

the product is not subject to special import or export restrictions

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 the Protection of Public Health, as amended

Act No. 254/2001 Coll., on Water, 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

Governmental decree no. 361/2007 Coll., laying down occupational health and safety conditions

product has no exposure limit; the product is not subject to the obligation to establish a controlled zone

Act no. 224/2015 Coll., on prevention of serious accidents caused by selected dangerous chemical substances or mixtures

15.2 Chemical safety assessment

Chemical safety assessment was performed when the substance was registered. The substance fulfils the criteria for classification as dangerous in accordance with EC Regulation No 1272/2008 CLP for physicochemical properties but does not meet the criteria for classification as a dangerous for human health and the environment, is not carcinogenic, mutagenic or toxic for reproduction (CMR), and is not identified as a PBT or vPvB substance.

Narcotic effects have been demonstrated for ethylene, however these only occur at concentrations of around 80% (i.e. 800 000 ppm or 917 857 mg/m³), which by far exceed the values of work exposure. This shows that ethylene is not dangerous for human health.

The exposure scenario was not developed in the joint submission. 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 adopted as a part of the revision process

10/26/2005: Revision (2): Editing information in the sections 2, 3.1, 4.5, 15.1, 15.2, 16

10/16/2006: Revision (3): Editing information in the sections 1, 2, 8, 12.5, 13 and 16

03/01/2007: Revision (4): Editing information in the sections 1 and 16

06/01/2007: Revision (5): Complete revision of the document in relation to the Regulation (EC) No 1907/2006 of the European Parliament and of the Council

12/01/2009: Revision (6): Editing information in the sections 1, 2.1, 8.1, 15, 16 and the „Declaration“

12/01/2010: Revision (7): Editing information in the sections 1 (registration number), 2 (classification and labeling according to CLP), and 16

08/01/2011: Revision (8): Complete revision of the document in relation to the updating of Annex II of Regulation (EC) No 1907/2006 REACH in accordance with Annex I of Commission Regulation (EU) No 453/2010

01/01/2012 / 8(1): Section 15.1.2 – updating legislation

01/06/2012 / 8(2): Section 1.1 - identifiers, Section 1.3 – update contact and Section 16 – abbreviations

- 05/31/2015 / 8(3): Section 1 (contact information), Section 2, Section 15.1 (update of legal regulations) and 16 (text deletion)
- 11/01/2016 / 8(4): Section 1 (contact information), Section 14 and 15 (editing in accordance with Regulation (EC) no. 830/2015), Section 15 (legislation update)
- 02/01/2018 / 8(5): Unification of SDS format after the ČeR merger into UNIPETROL RPA, including the editing of data in sections 1, 8, 9, 11, 12, 13 15 and 16
- 12/08/2020: Revision (9): Change of a classification of substance – updating according a valid legal regulation
- 30/11/2021: Revision (10): – 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;
Data modification in Sections 13 and 15 - update of the legal regulations;
Data modification in Section 1 – change of the company name;

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 thresholdless 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

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log Kow	Logarithm of distribution coefficient n-octanol/water
MARPOL	International convention on preventing boat pollution, as amended by the 1978 protocol
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 the material safety sheet

Annexes I, IV, VI and VII to Regulation (EC) No. 1272/2008 CLP, as amended;
 Principles for providing first aid upon being exposed to chemical substances;
 Substance registration documentation pursuant to Regulation (EC) No. 1907/2006 REACH;
 Decision of the European Chemicals Agency (ECHA) No. SUB-D-2114129354-54-01/F on registration pursuant to Directive (EC) No. 1907/2006 REACH;
 Research data sources (Hazardous Substances Data Bank HSDB, University of Akron Chemical UAKRON, Hygienické limity Gestis);

Full text of H-/ EUH-sentences and abbreviations of hazard classes stated in Section 2 and/or 3

H 220 Extremely flammable gas.
 H 280 Contains gas under pressure; may explode if heated.
 H 281 Contains refrigerated gas; may cause cryogenic burns or injury.
 H 336 May cause drowsiness or dizziness.
 Flam. Gas. Flammable gas
 Press Gas Gases under pressure
 STOT SE Specific target organ toxicity — single exposure

Training instructions

Persons handling the product must be advised of the risks involved in handling the product and the health and environmental protection requirements (see applicable provisions of the Labor Code).

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Access to information

Pursuant to Article 35 of Directive (EC) No. 1907/2006 REACH, every employer is obliged to allow access to the information stated on the given material safety sheet to all workers who use this product or are exposed to its impacts while working, and also to representatives of these workers.

Occupational exposure limit values for EU countries (see point 8.1.1)






















data for ethylene (number CAS 74-85-1)

	8-hour limit [mg.m ⁻³]	Short-term limit [mg.m ⁻³]
European Union (Regulation No. 2000/39/EC)	not specified	not specified
Belgium	233	not specified
Italy	not specified	not specified
Germany	not specified	not specified
Slovakia	not specified	not specified
France	not specified	not specified
Spain	not specified	not specified
Sweden	330	1200
Great Britain	not specified	not specified
Latvia	100	not specified

8-hour limit: Measured or calculated in relation to the 8-hour reference period as a timely weighted average

Short-term limit: Exposure limit value, which shall not be exceeded and which corresponds to a 15-minute period

Emergency telephone number for EU countries (see subsection 1.4)

National Centers	TELEPHONE	LANGUAGE	Institution / website / email
Belgium	 ☎+070245245	German	http://www.poissoncentre.be Centre Antipoisons, c/o Hôpital Militaire Reine Astrid Rue Bruyn 1, 1120 Bruxelles
Czech Republic	 ☎+420/224-919293; 915402	Czech	http://www.tis-cz.cz Toxikologické informační středisko (TIS) Na bojišti 1, 120 00 Praha 2 e-mail: tis@vfň.cz
France – Orfila (INRS)	 ☎+33/0145425959	French	"Centres Antipoison et de Toxicovigilance (CapTv) Hôpital Fernand Widal" 200 rue du Faubourg Saint Denis 75010 PARIS viviane.damboise@lrp.aphp.fr
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	Istituto Superiore di sanità – Preparati Pericolosi
Italy - Firenze	 ☎+39/0557947819	Italian	
Italy - Milano	 ☎+39/02-66101029	Italian	
Italy - Pavia	 ☎+39/0382-24444	Italian	
Italy - Napoli	 ☎+39/081-5453333	Italian	
Italy - Foggia	 ☎+39/800183459	Italian	
Italy - Verona	 ☎+39/800011858	Italian	
Italy - Roma	 ☎+39/06-49978000, ☎+39/06-3054343	Italian	
Germany	 ☎+49/112, ☎+49/116117	German	
Germany - Berlin	 ☎+49/3019240	German	https://giftnotruf.charite.de

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National Centers	TELEFONE	LANGUAGE	Institution / website / email
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	+49/076119240	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	+31/302748888	Dutch	http://www.productnotification.nl/
Poland - Kraków	+48/124119999	Polish	http://www.oit.cm.um.edu.pl
Poland – Gdansk	+48/586820404	Polish	http://www.pctox.pl/news.php
Poland – Poznań	+48/618476946	Polish	http://www.raszaja.poznan.pl/oddzialy/oddzialtoksykologiczny
Poland - Warszawa	+48/607218174	Polish	okzit@burdpi.pol.pl
Austria	+43/14064343	German	Austrian Poison Information Centre (Vergiftungsinformationszentrale-VIZ)
Slovakia	+421/254652307	Slovak	http://www.ntic.sk
Spain	+34/915620420	Spanish	Servicio de Información Toxicológica (SIT) Instituto Nacional de Toxicología y Ciencias Forenses (INTCF) C/José Echegaray nº4, 28232 Las Rozas de Madrid Madrid sit@mju.es / intcf@justicia.es

Prohlášení: The material safety sheet has been prepared in compliance with Directive (EC) No. 1907/2006 REACH. It includes data that are necessary for securing occupational health and safety and the protection of the environment. These data have been provided in good faith, correspond to the current state of knowledge and experience and are in accordance with our valid legal regulations. The data provided does not replace the quality specification and can not be considered as a guarantee of the suitability and usability of this product for a specific application. It is the responsibility of the product user to assess the accuracy of the information in a particular application where the product's properties can influence different factors. The consumer is responsible for compliance with the appropriate, regionally valid legal regulations.

ANNEX OF MATERIAL SAFETY DATA SHEET

EXPOSURE SCENARIOS ACCORDING TO ARTICLE 31 OF REGULATION (EC) NO 1907/2006 (REACH) OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

The substance is classified as dangerous in terms of physicochemical properties (with narcotic effects).

The chemical safety report (CSR) submitted by the lead registrant shows that no identified use the exposure scenarios need to be developed for any identified uses of the product and listed in an annex to the safety data sheet.

Justification:

“Ethylene does not fulfill the criteria for classification as dangerous for the environment, is not carcinogenic, mutagenic or toxic for reproduction (CMR) and is not persistent, bioaccumulating and toxic (PBT) or very persistent and very bioaccumulating (vPvB). Narcotic effects have been demonstrated in ethylene, however these only occur at concentrations of circa 80% (i.e. 800 000 ppm or 917 857 mg/m³), which highly exceed the values of any work exposure. Thus it follows that ethylene is not dangerous for human health and there is no associated risk which would require the designation of suitable precautions for its control. Thus there is no need to process and assess exposure scenarios.”

Information on the safe handling of the substance is incorporated into the body of the safety data sheet (Section 1-16).