



**SAFETY DATA SHEET**  
**ETHYLENE FOR**  
**POLYMERIZATION**

Date of issue: 13.07.2004

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replaces: 01.12.2010 – 7<sup>th</sup> issue

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

1.1 Product identifier

The table contains identifiers (names and identification numbers) of the product which is marketed under the following business name:

**ETHYLENE FOR POLYMERIZATION**

DATA SOURCE FOR IDENTIFICATION	IDENTIFIERS	
	NAME OF SUBSTANCE	IDENTIFICATION NO.
Registration in accordance with REACH Regulation	<b>Name on registration:</b> Ethylene	<b>registration no.:</b> 01-2119462827-27-0036
List of harmonized classifications (Annex VI of CLP)	<b>Name in the list:</b> Ethen Ethylene	<b>index no.:</b> 601-010-00-3
ECHA database of classifications and labels	<b>Name listed in the database:</b> database not yet available	<b>identification no.:</b> database not yet available
Other sources	<b>International chemical name:</b> Ethylene	<b>CAS:</b> 74-85-1 <b>EC:</b> 200-815-3

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

2.1.1 Identified use

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.

2.1.2 Non-recommended use

The registration documentation contains no non-recommended use.

1.3 Details of the supplier of the safety data sheet

- UNIPETROL RPA, s.r.o., Záluží 1, 436 70 Litvínov, Czech Republic

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- Safety sheet processor

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1.4 Emergency telephone number

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- MINISTRY OF HEALTH CENTRE

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☎: +420 224 919 293 (non-stop)

Na bojišti 1, 128 08 Prague 2, Czech Republic

☎: +420 224 915 402 (non-stop)

e-mail: [tis@mbox.cesnet.cz](mailto:tis@mbox.cesnet.cz)

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**SECTION 2: HAZARDS IDENTIFICATION**
**(A) Refrigerated liquefied product with temperatures approx. -93 to -82°C**

## 2.1 Classification of substance or mixture

The product is harmonically classified on the EU level as dangerous based on its entry, classification and labelling in part 3 of Annex VI of Regulation (EC) No 1272/2008 CLP.

## 2.1.1A CLP (Regulation (EC) No1272/2008 CLP):

FLAMMABLE GAS (CATEGORY 1)  
 GASES UNDER PRESSURE (REFRIGERATED LIQUEFIED GAS)  
 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (CATEGORY 3)

<b>Flam. Gas 1, H 220</b>
<b>Press. gas (Refrigerated liquefied gas), H 281</b>
<b>STOT SE 3, H 336</b>




## 2.1.2A DSD / DPD (directive) 67/548/EHS / directive 1999/45/ES):

EXTREMELY FLAMMABLE

<b>F+; R 12</b>
<b>R 67</b>

*Note: Full wording of H-, EUH- and R-phrases listed in Section 16*

## 2.2 Label elements

<i>product identifiers</i>	<b>ETHYLENE FOR POLYMERIZATION</b> ETHEN / ETHYLENE index number: 601-010-00-3
<i>hazard pictogram(s)</i>	   GHS02                      GHS04                      GHS07
<i>signal word</i>	DANGER
<i>hazard statements (H-, EUR-phrases)</i>	H220 H281 H336 Extremely flammable gas. Contains refrigerated gas; may cause cryogenic burns or injury. May cause drowsiness or dizziness
<i>precautionary statements (P-phrases)</i>	P210 P243 P261 P377 P381 P403 Keep away from heat/sparks/open flames/hot surfaces – No smoking. Take precautionary measures against static discharge. Avoid breathing gas. Leaking gas fire – do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Store in a well ventilated place.
UNIPETROL RPA, s.r.o. Záluží 1, 436 70 Litvínov, Czech Republic ☎: +420 476 161 111, +420 476 162 111, +420 476 163 111	

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

2.1B Classification of substance or mixture

The product is harmonically classified on the EU level as dangerous based on its entry, classification and labelling in part 3 of Annex VI of Regulation (EC) No 1272/2008 CLP.

2.1.1B CLP (Regulation (EC) No1272/2008 CLP) :

FLAMMABLE GAS (CATEGORY 1)  
 GASES UNDER PRESSURE (COMPRESSED GAS)  
 SPECIFIC TARGET ORGAN TOXICITY - SINGLE  
 EXPOSURE (CATEGORY 3)

<b>Flam. Gas 1, H 220</b>
<b>Press. gas (Compressed gas), H 280</b>
<b>STOT SE 3, H 336</b>




2.1.2B DSD / DPD (directive) 67/548/EHS / directive 1999/45/ES):

EXTREMELY FLAMMABLE

<b>F+; R 12</b>
<b>R 67</b>

*Note: Full wording of H-, EUH- and R-phrases listed in Section 16*

2.2B Label elements

<i>product identifiers</i>	<b>ETHYLENE FOR POLYMERIZATION</b> ETHEN / ETHYLENE index number: 601-010-00-3
<i>hazard pictogram(s)</i>	   GHS02                      GHS04                      GHS07
<i>signal word</i>	NEBEZPEČÍ
<i>hazard statements (H-, EUR-phrases)</i>	H220 H280 H336 Extremely flammable gas. Contains gas under pressure; may explode if heated. May cause drowsiness or dizziness
<i>precautionary statements (P-phrases)</i>	P210 P243 P261 P377 P381 P410+P403 Keep away from heat/sparks/open flames/hot surfaces – No smoking. Take precautionary measures against static discharge. Avoid breathing gas. Leaking gas fire – do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Protect from sunlight. Store in a well-ventilated place.
UNIPETROL RPA, s.r.o. Záluží 1, 436 70 Litvínov, Czech Republic ☎: +420 476 161 111, +420 476 162 111, +420 476 163 111	

### 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.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

name of substance :	Ethylene (for other names see Subsection 1.1)	
concentration [% of weight] :	min. 99,9	
index no. (index) :	601-010-00-3	
CAS :	74-85-1	
ES :	200-815-3	
CONTAMINANTS	NEME:	IDENTIFIER:
<i>the product does not contain any impurities, stabilizing additives or other substances which would affect its classification</i>		

## SECTION 4: FIRST AID MEASURES

### 4.1 Description of first aid measures

#### 4.1.1 General instructions

Ensure the operation of vital functions. In case of danger of loss of consciousness, move the patient into the stabilized position. Never give anything orally to unconscious individuals.

#### 4.1.2 In case of inhalation

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 In case of 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 In case of eye contact

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. Ensure specialized medical help immediately because freezing may cause serious eye damage.

#### 4.1.5 In case if swallowed

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.
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## 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 (CO<sub>2</sub>) 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 cause subsequent combustion. 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 fire fighters

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.

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## 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 Environment 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 sections

For recommended personal protective equipment see Subsection 8.2 („Limiting exposure“).

For recommended waste disposal see Section 13 („Disposal considerations“).

### SECTION 7: HANDLING AND STORAGE

#### 7.1 Safe handling instructions

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 not designated for specific use which would be adjusted by certain special recommendations. It is necessary to adhere to the instructions listed in Subsections 7.1 and 7.2 during manipulation and storage.

### SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

#### 8.1 Control parameters

Czech Republic (government Regulation No361/2007 Coll.)	PEL [mg.m <sup>-3</sup> ]	NPK-P [mg.m <sup>-3</sup> ]
name : ethylene	<b>Limit values for the substances are not determined</b>	
index no. : 601-010-00-3		
CAS : 74-85-1		
ES : 200-815-3		

PEL : permissible exposure limit of the chemical substance in the air

NPK-P : maximum permissible concentration of the chemical substance in the air

	8-hour limit [mg.m <sup>-3</sup> ]	short time limit [mg.m <sup>-3</sup> ]
European Union (Directive) 2000/39/ES)	not determined	not determined
Germany	not determined	not determined
Italy	not determined	not determined

	8-hour limit [mg.m <sup>-3</sup> ]	short time limit [mg.m <sup>-3</sup> ]
Slovakia	not determined	not determined
France	not determined	not determined

*8-hour limit:* measured or calculated in relation to the reference period of eight hours as a time-weighted average  
*short time limit:* limit value that should not be exceeded during exposure corresponding to 15 minutes

Recommended procedure for monitoring concentrations in the work environment: 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 controls

Technical protective measures to prevent exposure of people and the environment

Protective measures against exposure 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.

Individual protective measures

In case of danger of increased exposure due to product manipulation or due to other events, such as an accident or emergency, employees must have personal protective measures (PPM) available for the protection of airways, eyes, hands and skin, corresponding to 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 designated 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 MEASURES (PPM):

- *protection of airways:* isolating breathing device
- *protection of eye / face:* protective glasses or protective shield
- *protection of skin - hands* protective gloves against cold and possible frostbite  
the follow materials protect from the chemical effects of the substance

	<i>glove material</i>	<i>layer width</i>	<i>time of penetration</i>
general work activity (possibility of contamination)	nitril	0,4 mm	60 minutes
cleaning after leaks / emergencies	Viton	0,7 mm	480 minutes

- *protection of other body parts:* antistatic non-flammable protective clothing, antistatic shoes
- *heat danger:* not relevant for the identified manner of use

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

PROPERTY	UNIT	VALUE	NOTE
appearance		colorless gas	
odour		sweet	HSDB
odour threshold	[ppm]	260	UAKRON
pH value		not relevant	
melting / freezing point	[°C]	-169,15	

PROPERTY	UNIT	VALUE	NOTE
initial boiling point / boiling range	[°C]	-103,77	
flash point		not relevant for gases	
evaporation rate		not relevant for gases	
flammability	[% vol]	2,7 36	flammability limits: lower upper
upper explosion limit	[% vol]	32	HSDB
lower explosion limit	[% vol]	3,1	HSDB
vapour pressure	[hPa]	2124	at -90°C
vapour density	air=1	0,978	HSDB
relative density	[g.cm <sup>-3</sup> ]	0,5678	at -104°C
solubility	[mg.l <sup>-1</sup> ]	131	at 25°C
partition coefficient: n-octanol/water	[log Kow]	1,13	
auto-ignition temperature	[°C]	450	
decomposition temperature		does not break down at usual temperatures of use	
dynamic viscosity	[mPa.s]	0,01	at 20°C HSDB
explosive properties		substance is not explosive	
oxidising properties		substance has not oxidising properties	

9.2 Other information  
 Not required.

## 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: TOXICOLOGICAL INFORMATION**

## 11.1 Information on toxicological effects

## 11.1.1 Substance

HAZARD CLASS	EFFECT ON HEALTH	JUSTIFICATION
Acute toxicity	acute toxicity effect on human health for inhalation, ingestion or skin penetration are evident only from the following concentrations: <i>Acute toxicity</i> <i>oral: not relevant for gases</i> <i>dermal: not relevant for gases</i> <i>LC<sub>50</sub> inhalation: ≥65,4 mg.l<sup>-1</sup>/4h</i>	data from registration documentation
Skin corrosion/irritation	currently available information indicates that it is not necessary to classify the substance as caustic or irritating for the skin <i>not relevant for gases</i> <i>not relevant for gases</i> <i>not relevant for gases</i> <i>not relevant for gases</i>	currently there are no available data proving that the substance has the given property  data from registration documentation: <i>data available for humans and animals examination of acid or alkaline reserve in vitro study in vivo study</i>
Serious eye damage/irritation	currently available information indicates that it is not necessary to classify the substance as causing serious eye damage or irritation <i>not relevant for gases</i> <i>not relevant for gases</i> <i>not relevant for gases</i> <i>not relevant for gases</i>	currently there are no available data proving that the substance has the given property  data from registration documentation: <i>data available for humans and animals examination of acid or alkaline reserve in vitro study in vivo study</i>
Respiratory or skin sensitisation	based on available data the substance does not cause allergic reaction and therefore it does not need to be classified as sensitizing <i>No entries in available literature indicate that the product could cause allergic reactions</i> <i>not relevant for gases</i>	data from registration documentation: <i>data available for humans and animals</i>  <i>in vivo study</i>
Germ cell mutagenicity	currently available information indicates that it is not necessary to classify the substance as causing hereditary genetic changes <i>no genotoxic properties</i> <i>no genotoxic properties</i>	data from registration documentation: <i>in vitro study</i> <i>in vivo study</i>

HAZARD CLASS	EFFECT ON HEALTH	JUSTIFICATION
Carcinogenicity	currently available information indicates that it is not necessary to classify the substance as causing cancer <i>studies listed in the registration documentation indicate that no carcinogenic properties were demonstrated in the substance</i>	data from registration documentation: <i>experimental study</i>
Reproductive toxicity	based on available information there is no need to classify the substance for adverse effects on fertility or fetus development <i>no detrimental reproductive or developmental effects were recorded</i>	data from registration documentation: <i>fertility prenatal developmental toxicity</i>
Specific target organ toxicity – single exposure	narcotic effects, may cause temporary sleepiness or dizziness <i>the listed effects were documented in humans only at concentrations of 80% ethylene volume (i.e. 800 000 ppm or 917 000 mg.m<sup>-3</sup>)</i>	harmonized classification in accordance with Annex VI of EC Directive No 1272/2008 CLP data from registration documentation
Specific target organ toxicity – repeated exposure	currently available information indicates that it is not necessary to classify the substance as damaging human organs at repeated exposure <i>low subchronic toxicity value discovered on inhalation</i>	currently there are no available data proving that the substance has the given property  data from registration documentation: <i>subacute and subchronic toxicity</i>
Aspiration hazard	currently available information indicates that consumption or inhalation into airways does not cause lungs damage or death	currently there are no available data proving that the substance has the given property

#### 11.1.2 Information on likely routes of exposure

Inhalation is the most significant type of exposure.

#### 11.1.3 Symptoms and effects (acute, delayed and chronic after short-time and long-time 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.

**SECTION 12: ECOLOGICAL INFORMATION**

## 12.1 Toxicity

*AQUATIC 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.

Subacute toxicity on invertebrates: EC50, 48 h: 62,48 mg.l<sup>-1</sup> (*Daphnia*) // (Q)SAR METHOD/

Study of water plants growth inhibition: EC50, 96 h: 30,32 mg.l<sup>-1</sup> // (Q)SAR METHOD/

Subacute toxicity on fish: LC50, 96 h: 126 mg.l<sup>-1</sup> // (Q)SAR METHOD/

Testing inhibition of activated sludge respiration: 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)

## 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 lead 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 Other adverse effects

The product is not considered a dangerous detrimental substance in accordance with Annex 1 of water Act No 254/2001.

**SECTION 13: DISPOSAL CONSIDERATION**

## 13.1 Waste treatment methods

If the product becomes waste, e.g. due to an accident or emergency, it is necessary to adhere to regulations valid in the EU as well as locally and nationally.

13.1.1 Recommended waste classification according to Decree No 381/2001 Coll. (Waste catalogue)

If the product becomes waste, e.g. due to an accident or emergency, it is necessary to adhere to regulations valid in the EU as well as locally and nationally

13.1.2 Recommended methods of waste disposal

Burn the gas 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 Considerations for limiting exposure when handling wastes

Never release the product 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.

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## 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

Cooled liquefied ethylene is transported by tank cars. Information on transport classification are in accordance with the following UN Model Regulations:

European Agreement concerning the International Carriage of Dangerous Goods (ADR),  
International Carriage of Dangerous Goods by Rail (RID).

- 14.1 UN 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 hazardous for the environment in accordance with criteria stated in the UN Model Regulations
- 14.6 Special precautions for user: none
- 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: the product is not intended to be carried in bulk in accordance with the International Maritime Organization (IMO) documents
- 14.8 Other information
- Hazard identification number: 233
- Classification code: 3F
- Safety sign: 2.1 + (13)\*
- Note: \*Safety sign for displacement „MOVE WITH CARE“ (only valid for RID)

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## SECTION 15: REGULATORY INFORMATION

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

15.1.1 European Union

Regulation (EC) No 1907/2006 (REACH) of the European Parliament and of the Council, as amended  
REGISTRATION (TITLE II OF REACH REGULATION)

The product was fully registered as a substance.

**AUTHORIZATION (TITLE VII OF 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 REACH REGULATION)**

It is necessary to adhere to the limitations listed in list no. 40 of Annex XVII of EC Regulation No 1907/2006 REACH when producing, using and marketing this product.

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

The product has been classified in accordance with the abovementioned regulation. Obligations related to packing and labeling the package of hazardous chemical substance do not apply to the product with regards to the fact that it is not packed upon entering the market.

**Regulation (EC) No 689/2008 of the European Parliament and of the Council concerning the export and import of dangerous chemicals, as amended**

The product does not adhere to any special regulations for export and import.

**Directive 2006/12/EC of the European Parliament and of the Council on waste, as amended**

Implemented into Act No 185/2001 Coll. on waste.

**Council Directive No 96/82/EC on the control of major-accident hazards involving dangerous substances, as amended**

Implemented into Act No 59/2006 Coll. on the prevention of serious accidents

**15.1.2 The Czech Republic**

Act No 356/2003 Coll. on chemical substances and preparations, as amended

Act No 258/2000 Coll. on protection of public health, as amended

Act No 254/2001 Coll., on waters, as amended

Act No 86/2002 Coll., on the protection of the air, as amended

Act No 185/2001 Coll., on waste, as amended

Decree No 381/2001 Coll., in which the Waste Catalogue is stated, as amended

Government Regulation No 361/2007 Coll., determining conditions for occupational health protection, as amended

Act No 59/2006 Coll., on the prevention of serious accidents, as amended

Decree No 256/2006 Coll., on details of the serious accident prevention system, as amended

**15.2 Chemical safety assessment**

Chemical safety assessment was performed. The substance fulfils the criteria for classification as dangerous in accordance with directive 67/548/EUH and EC Regulation No 1272/2008 CLP. 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 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/m<sup>3</sup>), which by far exceed the values of work exposure. This shows that ethylene is not dangerous for human health.

**SECTION 16: OTHER INFORMATION****Changes made at revision**

26.10.2005: Editing information in chapters 2, 3.1, 4.5, 15.1, 15.2, 16

16.10.2006: Editing information in chapters 1, 2, 8, 12.5, 13 and 16

01.03.2007: Editing information in chapters 1a 16

01.06.2007: Complete revision of the document in relation to the Regulation (EC) No 1907/2006 of the European Parliament and of the Council

- 01.12.2009: Editing information in chapters 1, 2.1, 8.1, 15, 16 and „Proclamation“  
01.12.2010: Editing information in chapters 1 (registration number), 2 (classification and labeling according to CLP), 16 and added annex  
01.08.2011: 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

**Abbreviations used in the text**

CAS number	Registration number assigned to the substance by the Chemical Abstracts Service of the American Chemical Society.
EC number	Official number of the chemical substance in the European Union: EINECS (European Inventory of Existing Commercial Substances), or ELINCS (European List of Notified Chemical Substances), or NLP (No longer polymer list).
REACH (Regulation)	EU Regulation No 1907/2006 on the Registration, Evaluation and Authorization of Chemicals.
CLP (Regulation)	EU Regulation No 1272/2008 on the Classification, Labeling and Packaging of chemical substances and mixtures, which implements the United Nations' Globally Harmonized System into EU legislature.
DSD	EU Directive No 67/548/EHS, the Dangerous Substances Directive.
DPD	EU Directive No 1999/45/ES, the Dangerous Preparations Directive.
ECHA	European Chemicals Agency.
UVCB substances	Substances of Unknown or Variable composition, Complex reaction products or Biological materials.
ČSN EN (ISO)	European norm accepted into the Czech technical norms system.
OSN or UN	The United Nations.
IBC	The Intermediate Bulk Container.
MARPOL 73/78	The International Convention for the Prevention of Pollution from Ships of 1978.
(Q)SAR	A theoretical mathematical model, which can be used to obtain the properties of substances based on the relationship between its structure and activity („Quantitative Structure-Activity Relationship“).
HSDB	Hazardous Substances Data Bank.
UAKRON	Chemical database (The University of Akron).

**Sources of data used for setting up the safety sheet**

Company records of Unipetrol RPA, s.r.o. on the classification of dangerous properties of products Annexes I, IV, VI and VII to EC Regulation No 1272/2008 CLP, as amended  
Principles for provision of first aid following exposure to chemical substances (doc. MUDr. Daniela Pelclová at al.)  
Registration documentation for the substance in accordance with EC Regulation No 1907/2006 REACH  
Decision of ECHA No SUB-D-2114118349-48-01/F on registration in accordance with EC Regulation No 1907/2006 REACH  
Research data sources (Hazardous Substances Data Bank HSDB, University of Akron Chemical UAKRON, Gestis sanitary limits)

**Full wording of R-phrases, H-phrases and EUH-phrases listed in SECTIONS 2 and/or 3**

R 12	Extremely flammable
R 67	Vapors may cause drowsiness and dizziness
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.

#### Training guidelines


Those who manipulate with the product must be demonstrably informed of its dangerous properties, principles of protecting the environment and health from its harmful effects and principles of first aid (see appropriate provisions of the labor law, as amended).

#### Access to information

According to article 35 of EC Regulation No 1907/2006 Reach, each employer must allow access to information listed in the safety sheet to all workers who use this product or are exposed to its effects during their work, and also to representatives of such workers.

#### Elements of the original labelling of dangerous substance in accordance with DSD Directive 67/548/EHS

**WARNING !!!** Only used informally, to ensure continuity between the former and new labelling of dangerous substances. **THE ELEMENTS LISTED BELOW CAN NO LONGER BE USED TO LABEL THIS PRODUCT !!!** The new labelling must be in accordance with Subsection 2.2.

<i>graphic symbol of danger</i>			 extremely flammable		
<i>written symbol of danger</i>			<b>F+</b>		
<i>R-phrases</i>	R 12	Extremely flammable			
	R 67	Vapors may cause drowsiness and dizziness			
<i>S-phrases</i>	S 9	Keep container in a well-ventilated place			
	S 16	Keep away from sources of ignition - No smoking			
	S 33	Take precautionary measures against static discharges			
	S 45	In case of accident or if you feel unwell seek medical advice immediately (show the label where possible)			

#### Inspection and verification of safety sheet contents

Inspection and verification of the accordance of this document with the requirements of EC Regulation No 1907/2006 REACH and EC Directive No 1272/2008 CLP were performed by an independent specialist – Ing. Oldřich Petira, CSc., an authorized specialist in the fields of chemistry and environmental protection with an emphasis on industrial toxicology and chemical safety of the environment.

**Proclamation:** Material This Material Safety Data Sheet has been elaborated in accordance with the Regulation (EC) No 1907/2006 REACH. It contains information necessary to ensure safety and protection of health at work and of the environment. This information does not substitute quality specification and should not be construed as any guarantee of suitability for particular applications. The data contained are based on the present state of knowledge and current national legislation. The user is responsible for ensuring the compliance with the relevant regional legislation.

According to the authorization form on behalf of UNIPETROL RPA,s.r.o. elaborated by:  
 Health, Safety, Environment & Quality (HSE&Q) Department, UNIPETROL SERVICES, s.r.o.

**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 Chemical Safety Report (CSR) presented by the main registrant at the product registration shows that no exposure scenarios need to be processed and annexed to the safety 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/m<sup>3</sup>), 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.