

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

## Ethylene (compressed liquefied gas)

Version 1.0

Revision Date: 25.05.2022

Former date: -

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

#### 1.1 Product identifier

Trade name : Ethylene

REACH Registration Number : 01-2119462827-27-0009, 01-2119462827-27-0015, 01-2119462827-27-0016, 01-2119462827-27-XXXX

Substance name : ethylene

EC-No. : 200-815-3

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

Use of the Substance/Mixture : Raw material in chemical industry

#### 1.3 Details of the supplier of the safety data sheet

Manufacturer : Borealis AB  
S-444 86 Stenungsund, Sweden  
Telephone: +46 303 86000

Borealis Polymers Oy  
P.O.Box 330, FI-06101 Porvoo, Finland  
Telephone: +358 9 394900

Supplier : Borealis AG  
Trabrennstrasse 6-8, 1020 Vienna, Austria  
Telephone: +43 1 22400 0

E-mail address : [sds@borealisgroup.com](mailto:sds@borealisgroup.com)

#### 1.4 Emergency telephone number

+44 (0) 1235 239 670 (NCEC Carechem 24)

### SECTION 2: Hazards identification

#### 2.1 Classification of the substance or mixture

**Classification (REGULATION (EC) No 1272/2008)**

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Flammable gases, Category 1A	H220: Extremely flammable gas.
Gases under pressure, Compressed gas	H280: Contains gas under pressure; may explode if heated.
Specific target organ toxicity - single exposure, Category 3, Central nervous system	H336: May cause drowsiness or dizziness.

### 2.2 Label elements

#### Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Danger

Hazard statements : H220 Extremely flammable gas.  
H280 Contains gas under pressure; may explode if heated.  
H336 May cause drowsiness or dizziness.

Precautionary statements : **Prevention:**  
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
P261 Avoid breathing gas.  
**Response:**  
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
P381 In case of leakage, eliminate all ignition sources.  
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
**Storage:**  
P410 + P403 Protect from sunlight. Store in a well-ventilated place.

### 2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

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Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Rapid evaporation of the product may cause frostbite.  
May displace oxygen and cause rapid suffocation.  
Risk of explosion if heated under confinement.  
Vapours may form explosive mixtures with air.

### SECTION 3: Composition/information on ingredients

#### 3.1 Substances

Substance name : ethylene

EC-No. : 200-815-3

#### Components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)	M-Factor, SCL, ATE
ethylene	74-85-1 200-815-3	>= 98	

### SECTION 4: First aid measures

#### 4.1 Description of first aid measures

General advice : Move out of dangerous area.  
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).  
First aider needs to protect himself.

If inhaled : Move to fresh air.  
Do not leave the victim unattended.  
Causes asphyxiation in high concentrations. The victim will not realize that he/she is suffocating.  
Keep warm and at rest and provide fresh air.  
Seek medical advice immediately.  
Give oxygen or artificial respiration if needed.  
If unconscious, place in recovery position and seek medical advice.

In case of skin contact : Remove/ Take off immediately all contaminated clothing.  
If clothing already frozen and stuck to the skin:

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- Do not remove contaminated clothing.  
Wash frost-bitten areas with plenty of lukewarm water.  
Do not rub affected area.  
Seek medical advice.
- In case of eye contact : Remove contact lenses.  
Rinse thoroughly with plenty of water, also under the eyelids.  
Keep eye wide open while rinsing.  
Seek medical advice.
- If swallowed : Not probable:  
The product evaporates readily.

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

- Symptoms : Skin contact may provoke the following symptoms:  
Frostbite
- Inhalation:  
Suffocation  
Drowsiness

- Risks : Vapours may cause drowsiness and dizziness.

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

- Treatment : There is no specific antidote available.  
Treat frost-bitten areas as needed.

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## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

- Suitable extinguishing media : Dry powder, carbon dioxide, foam and water mist.
- Unsuitable extinguishing media : Do NOT use water jet.

### 5.2 Special hazards arising from the substance or mixture

- Specific hazards during firefighting : Vapours may form explosive mixtures with air.  
Flash back possible over considerable distance.  
Do not allow run-off from fire fighting to enter drains or water courses.  
Risk of explosion.  
Incomplete combustion may produce:  
Carbon dioxide (CO<sub>2</sub>)  
Carbon monoxide  
Smoke

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### 5.3 Advice for firefighters

Special protective equipment for firefighters : Wear self-contained breathing apparatus and protective suit.

Further information : Attempt to stop leakage without personal risk.  
If conditions permit, let fire burn itself out.  
Cool tanks with water spray.

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## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

Vapours can cause suffocation by reducing oxygen available for breathing.  
Use personal protective equipment.  
Avoid breathing vapours, mist or gas.  
Ensure adequate ventilation.  
Keep people away from and upwind of spill/leak.  
Eliminate all ignition sources if safe to do so.  
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so.  
Prevent product from entering environment and drains.  
Observe the risk of explosion.  
If major spillage occurs, contact the proper local authorities.

### 6.3 Methods and material for containment and cleaning up

Allow to evaporate.  
Ensure adequate ventilation, especially in confined areas.

### 6.4 Reference to other sections

For personal protection see section 8.

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## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Advice on safe handling : Refill and handle product only in closed system.  
Prevent leaks by checking valves, pipelines and joints regularly.

Advice on protection against fire and explosion : Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. To avoid ignition of vapours by static electricity discharge, all metal

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parts of the equipment must be grounded. Ensure adequate ventilation. Risk of explosion if heated under confinement. Vapours may form explosive mixtures with air. High risk of fire in case of leakage. Do not pressurise, cut, weld, braze, solder, drill, or grind on containers.

Hygiene measures : When using do not eat, drink or smoke.

### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep container in a well-ventilated place. Keep product and empty container away from heat and sources of ignition. Keep in a cool place away from oxidizing agents. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Advice on common storage : Keep away from combustible material. See chapter 10.

Recommended storage temperature : < -100 °C

### 7.3 Specific end use(s)

Specific use(s) : Not applicable

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

Contains no substances with occupational exposure limit values.

#### Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
Ethylene				
Remarks:	Not applicable			

#### Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
Ethylene		
Remarks:	Not applicable	

### 8.2 Exposure controls

#### Engineering measures

Application in a closed system  
Provide adequate ventilation.  
Use personal protective equipment.

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### Personal protective equipment

- Eye protection : Safety goggles or face-shield.  
Equipment should conform to EN 166
- Hand protection
- Remarks : Cold-insulating gloves (e.g. nitrile rubber).
- Skin and body protection : Wear suitable protective clothing.  
Leather boots  
Safety shoes
- Respiratory protection : In case of insufficient ventilation: Self-contained breathing apparatus.  
Vapours can cause suffocation by reducing oxygen available for breathing.

### Environmental exposure controls

- General advice : Prevent further leakage or spillage if safe to do so. Prevent product from entering environment and drains. Observe the risk of explosion. If major spillage occurs, contact the proper local authorities.

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## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

- Physical state : gaseous  
compressed liquefied gas
- Colour : colourless
- Odour : mild, sweet
- Odour Threshold : No data available
- Melting point : -169 °C
- Boiling point : -104 °C
- Flammability : Extremely flammable.
- Upper explosion limit / Upper flammability limit : Upper flammability limit  
36 %(V)
- Lower explosion limit / Lower flammability limit : Lower flammability limit  
2,7 %(V)

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Flash point	:	Not applicable
Auto-ignition temperature	:	450 °C (1.013 hPa)
Decomposition temperature	:	Heating or fire can release toxic and irritating gases.
pH	:	No data available
Viscosity		
Viscosity, dynamic	:	Not applicable
Viscosity, kinematic	:	Not applicable
Solubility(ies)		
Water solubility	:	0,131 g/l (25 °C)
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	log Pow: 1,13 (20 °C)
Vapour pressure	:	2.124 hPa (-90 °C)
Relative density	:	0,5678 (-104 °C)
Relative vapour density	:	0,98 (Air = 1.0)

### 9.2 Other information

Evaporation rate	:	No data available
Molecular weight	:	28,05 g/mol

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

No dangerous reaction known under conditions of normal use.

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

Hazardous reactions : Vapours may form explosive mixture with air.

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### 10.4 Conditions to avoid

Conditions to avoid : Keep away from heat and sources of ignition.  
Observe the risk of explosion.

### 10.5 Incompatible materials

Materials to avoid : Strong oxidizing agents

### 10.6 Hazardous decomposition products

In case of fire hazardous decomposition products may be produced such as:  
Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

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## SECTION 11: Toxicological information

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

#### Acute toxicity

Based on available data, the classification criteria are not met.

#### Components:

##### ethylene:

Acute oral toxicity : Remarks: No data available

Acute inhalation toxicity : LC50 (Rat): > 65,4 mg/l, > 57000 ppm  
Test atmosphere: gas

Acute dermal toxicity : Remarks: No data available

#### Skin corrosion/irritation

Based on available data, the classification criteria are not met.

#### Components:

##### ethylene:

Remarks : study technically not feasible  
(gaseous)  
Contact with liquid or refrigerated gas can cause cold burns  
and frostbite.

#### Serious eye damage/eye irritation

Based on available data, the classification criteria are not met.

#### Components:

##### ethylene:

Remarks : study technically not feasible  
(gaseous)  
Contact with liquid or refrigerated gas can cause cold burns

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and frostbite.

### Respiratory or skin sensitisation

#### Skin sensitisation

Based on available data, the classification criteria are not met.

#### Respiratory sensitisation

Based on available data, the classification criteria are not met.

#### Components:

##### ethylene:

Remarks : study technically not feasible  
(gaseous)

### Germ cell mutagenicity

Based on available data, the classification criteria are not met.

#### Components:

##### ethylene:

Genotoxicity in vitro : Test Type: Ames test  
Metabolic activation: with and without metabolic activation  
Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)  
Result: negative  
Remarks: In vitro tests did not show mutagenic effects

Genotoxicity in vivo : Test Type: Micronucleus test  
Species: Rat  
Result: negative

### Carcinogenicity

Based on available data, the classification criteria are not met.

#### Components:

##### ethylene:

Species : Rat  
Application Route : Inhalation  
Exposure time : 106 weeks  
Activity duration : 6 h  
Frequency of Treatment : 5 days/week  
NOAEL : 3.000 ppm  
Method : OECD Test Guideline 453  
Result : negative  
Remarks : IARC evaluation:  
Group 3: Not classifiable as to its carcinogenicity to humans

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### Reproductive toxicity

Based on available data, the classification criteria are not met.

#### Components:

##### **ethylene:**

Effects on fertility : Species: Rat  
Application Route: inhalation (gas)  
General Toxicity - Parent: No observed adverse effect level:  
5.737 mg/m<sup>3</sup>  
General Toxicity F1: No observed adverse effect level: 5.737  
mg/m<sup>3</sup>  
Method: OECD Test Guideline 421

Effects on foetal development : Species: Rat  
General Toxicity Maternal: NOAEC: 5.737 mg/m<sup>3</sup>  
Developmental Toxicity: NOAEC: 5.737 mg/m<sup>3</sup>  
Method: OECD Test Guideline 421

### STOT - single exposure

Vapours may cause drowsiness and dizziness.

### STOT - repeated exposure

Based on available data, the classification criteria are not met.

### Repeated dose toxicity

#### Components:

##### **ethylene:**

NOAEC : 10000 ppm  
Application Route : Inhalation  
Method : OECD Test Guideline 413

Application Route : Dermal  
Remarks : study technically not feasible  
(gaseous)

Application Route : Oral  
Remarks : study technically not feasible  
(gaseous)

### Aspiration toxicity

Based on available data, the classification criteria are not met.

## 11.2 Information on other hazards

### Endocrine disrupting properties

#### Product:

Assessment : The substance/mixture does not contain components

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considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

### Further information

#### Product:

Remarks : Absorbs into the body by inhalation.

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## SECTION 12: Ecological information

### 12.1 Toxicity

#### Components:

##### ethylene:

Toxicity to fish	: LC50 : 126 mg/l Exposure time: 96 h Method: QSAR Remarks: Aquatic toxicity is unlikely. (gaseous)
Toxicity to daphnia and other aquatic invertebrates	: LC50 (Daphnia (water flea)): 62 mg/l Exposure time: 48 h Method: QSAR Remarks: Aquatic toxicity is unlikely. (gaseous)
Toxicity to algae/aquatic plants	: EbC50 (Scenedesmus capricornutum (fresh water algae)): 30,3 mg/l Exposure time: 96 h Test Type: Growth inhibition Method: QSAR
Toxicity to microorganisms	: Remarks: No data available
Toxicity to fish (Chronic toxicity)	: NOELR: 22,083 mg/l Exposure time: 32 d Species: Oncorhynchus mykiss (rainbow trout) Method: QSAR  Chronic Toxicity Value: 12,385 mg/l Exposure time: 30 d Method: QSAR

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Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOELR: 41,311 mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Method: QSAR

Chronic Toxicity Value: 6,311 mg/l  
Species: Daphnia sp. (water flea)  
Method: QSAR

### 12.2 Persistence and degradability

#### Components:

##### **ethylene:**

Biodegradability : Method: QSAR  
Remarks: Readily biodegradable.

### 12.3 Bioaccumulative potential

#### Components:

##### **ethylene:**

Bioaccumulation : Bioconcentration factor (BCF): 2,59  
Remarks: Bioaccumulation not expected: Partition coefficient (n-octanol/water) log Pow < 3.

Partition coefficient: n-octanol/water : log Pow: 1,13 (20 °C)

### 12.4 Mobility in soil

#### Components:

##### **ethylene:**

Mobility : Remarks: Soil, Not expected to adsorb on soil., The product evaporates readily to air.

### 12.5 Results of PBT and vPvB assessment

#### Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher..

### 12.6 Endocrine disrupting properties

#### Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according

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to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

### 12.7 Other adverse effects

#### **Product:**

Environmental fate and pathways : Prone to photochemical degradation, reacting with OH radicals and ozone.

Additional ecological information : No known adverse effect on the environment.  
Biological effects on:  
terrestrial plants.  
Symptoms:  
inhibition of growth  
yield reduction  
curling of leaves  
ripening of fruits.

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## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

Product : Where possible recycling is preferred to disposal or incineration.

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## SECTION 14: Transport information

### 14.1 UN number or ID number

ADR : UN 1962

IMDG : UN 1962

### 14.2 UN proper shipping name

ADR : ETHYLENE

IMDG : ETHYLENE

### 14.3 Transport hazard class(es)

ADR : 2

IMDG : 2.1

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### 14.4 Packing group

#### ADR

Packing group : Not assigned by regulation  
Classification Code : 2F  
Hazard Identification Number : 23  
Labels : 2.1  
Tunnel restriction code : (B/D)

#### IMDG

Packing group : Not assigned by regulation  
Labels : 2.1  
EmS Code : F-D, S-U

### 14.5 Environmental hazards

#### ADR

Environmentally hazardous : no

#### IMDG

Marine pollutant : no

### 14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

### 14.7 Maritime transport in bulk according to IMO instruments

Remarks : Not applicable

## SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) : Conditions of restriction for the following entries should be considered:  
Number on list 40

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

Category		Quantity 1	Quantity 2
P2	FLAMMABLE GASES	10 t	50 t

#### Other regulations:

No data available

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### 15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

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## SECTION 16: Other information

### Full text of other abbreviations

#### Further information

Issuer : Borealis, Group Product Stewardship / Mikaela Eriksson.

Sources of key data used to compile the Safety Data Sheet : International Chemical Safety Card, Ethylene, March 1996, updated 2005 (<http://www.inchem.org/documents/icsc/icsc/eics0475.htm>)  
Chemical Safety Report, Ethylene, Lower Olefins and Aromatics REACH Consortium, 2021

#### Disclaimer

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