

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Ethylene

Version 12.2

Revision Date 21.10.2011

Print Date 24.10.2011

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : Ethylene
Registration number : 01-2119462827-27-XXXX, 01-2119462827-27-0016
Substance name : ethylene
Substance 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
Wagramerstrasse 17-19, 1220 Vienna, Austria
Telephone: +43 1 22400 0

E-mail address : sds@borealisgroup.com

1.4 Emergency telephone number

+32 3 570 5354 Shift supervisor, Dehydrogenation plant (24h)
+32 70 245 245 Centre Antipoisons Belge (24h)

2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable gases, Category 1	H220: Extremely flammable gas.
Gases under pressure, Refrigerated liquefied gas	H281: Contains refrigerated gas; may cause cryogenic burns or injury.
Specific target organ toxicity - single exposure, Category 3	H336: May cause drowsiness or dizziness.

Classification (67/548/EEC, 1999/45/EC)

Extremely flammable	R12: Extremely flammable.
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Ethylene

Version 12.2

Revision Date 21.10.2011

Print Date 24.10.2011

R67: Vapours may cause drowsiness and dizziness.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal word : Danger

Hazard statements : H220 Extremely flammable gas.
H336 May cause drowsiness or dizziness.
H281 Contains refrigerated gas; may cause cryogenic burns or injury.

Precautionary statements : **Prevention:**
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Response:
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 Eliminate all ignition sources if safe to do so.
Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

2.3 Other hazards

The product evaporates readily.
Rapid evaporation of the liquid may cause frostbite.
Vapours can cause suffocation by reducing oxygen available for breathing.
Risk of explosion if heated under confinement.
Vapours may form explosive mixtures with air.
High risk of fire in case of leakage.

3. Composition/information on ingredients

3.1 Substances

Chemical Name	CAS-No. EINECS-No. / ELINCS No.	Concentration [%]
ethylene	74-85-1 200-815-3	> 98

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).
- 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 : Rapid evaporation of the liquid may cause frostbite.
Wash frost-bitten areas with plenty of water. Do not remove clothing.
Seek medical advice.
- In case of eye contact : Remove contact lenses.
Rinse immediately with plenty of water for at least 15 minutes.
Keep eye wide open while rinsing.
Get medical attention if irritation develops and persists.
- 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 may provoke the following symptoms:
Drowsiness
Suffocation

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.

5. Firefighting measures

5.1 Extinguishing media

- Suitable extinguishing media : Dry powder, carbon dioxide, foam and water mist.

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.

Ethylene

Version 12.2

Revision Date 21.10.2011

Print Date 24.10.2011

Do not allow run-off from fire fighting to enter drains or water courses.

Risk of explosion.

Incomplete combustion may produce:

Carbon dioxide (CO₂)

Carbon monoxide

Smoke

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.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Vapours can cause suffocation by reducing oxygen available for breathing.
Use personal protective equipment.
Avoid breathing vapors, 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

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 materials for containment and cleaning up

Methods for cleaning up : Allow to evaporate.
Ensure adequate ventilation, especially in confined areas.

6.4 Reference to other sections

For personal protection see section 8.

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 : Keep away from sources of ignition - No smoking.

Ethylene

Version 12.2

Revision Date 21.10.2011

Print Date 24.10.2011

fire and explosion

Take precautionary measures against static discharges.
 To avoid ignition of vapours by static electricity discharge, all metal 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.

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.
 No smoking.

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

Storage temperature : < -100 °C

7.3 Specific end uses

Specific use(s) : Not applicable

8. Exposure controls/personal protection

8.1 Control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
ethylene	74-85-1	TGG 8 hr	200 ppm 233 mg/m3	2007-06-07	BE OEL
Further information	:	A: These substances release gasses or vapour which in itself have no physiological functionality, but which can reduce the oxygen concentration in the air. When the oxygen concentration reduces below 17-18% (weight/weight), it causes oxygen shortage asphyxiation, which manifests without a warning before.			

DNEL : Not applicable

PNEC : Not applicable

8.2 Exposure controls

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Ethylene

Version 12.2

Revision Date 21.10.2011

Print Date 24.10.2011

Engineering measures

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

Personal protective equipment

Respiratory protection : In case of insufficient ventilation: Self-contained breathing apparatus.
Vapours can cause suffocation by reducing oxygen available for breathing.

Hand protection : Cold-insulating gloves (e.g. nitrile rubber).

Eye protection : Safety goggles or face-shield.

Skin and body protection : Wear suitable protective clothing and rubber boots.

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.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : gaseous
Refrigerated liquefied gas

Colour : colourless

Odour : no data available

Odour Threshold : no data available

pH : no data available

Melting point : -169 °C

Boiling point : -104 °C

Flash point : not applicable

Evaporation rate : no data available

Flammability (solid, gas) : Extremely flammable.

Lower explosion limit : lower flammability limit, 2,7 %(V)

Upper explosion limit : upper flammability limit, 36 %(V)

Vapour pressure : 2.124 hPa, -90 °C

Relative vapour density : 0,98, (Air = 1.0)

Relative density : 0,5678, -104 °C

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Ethylene

Version 12.2

Revision Date 21.10.2011

Print Date 24.10.2011

Water solubility	: 0,131 g/l, 25 °C
Solubility in other solvents	: no data available
Partition coefficient: n-octanol/water	: log Pow: 1,13, 25 °C
Autoignition temperature	: 450 °C
Thermal decomposition	: Heating or fire can release toxic and irritating gases.
Viscosity, dynamic	: not applicable
Viscosity, kinematic	: not applicable

9.2 Other information

Molecular Weight	: 28,05 g/mol
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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.
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10.5 Incompatible materials

Materials to avoid	: Strong oxidizing agents
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10.6 Hazardous decomposition products

Hazardous decomposition products	: In case of fire hazardous decomposition products may be produced such as: Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).
Thermal decomposition	: Note: Heating or fire can release toxic and irritating gases.

11. Toxicological information

11.1 Information on toxicological effects

Product

Acute oral toxicity	: no data available
Acute inhalation toxicity	: LC50: > 65,4 mg/l, > 57000 ppm, rat, Based on available data, the classification criteria are not met.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Ethylene

Version 12.2

Revision Date 21.10.2011

Print Date 24.10.2011

Acute dermal toxicity	: no data available
Skin corrosion/irritation	: Contact with liquid or refrigerated gas can cause cold burns and frostbite.
Serious eye damage/eye irritation	: not applicable, (gaseous)
Respiratory or skin sensitization	: no data available
Germ cell mutagenicity	
Genotoxicity in vitro	: In vitro tests did not show mutagenic effects
Genotoxicity in vivo	: In vivo tests did not show mutagenic effects
Carcinogenicity	: Not classifiable as a human carcinogen., IARC evaluation:, Group 3: Not classifiable as to its carcinogenicity to humans
Reproductive toxicity	: Fertility and developmental toxicity tests did not reveal any effect on reproduction.
STOT - single exposure	: Assessment: May cause drowsiness or dizziness.
STOT - repeated exposure	: Inhalation, The substance or mixture is not classified as specific target organ toxicant, repeated exposure., Repeated exposure may result in irreversible damage to the central nervous system (solvent-induced neurotoxicity). : Dermal, Not applicable, (gaseous) : Oral, Not applicable, (gaseous)
Aspiration toxicity	: no data available
Further information	: Absorbs into the body by inhalation.

12. Ecological information

12.1 Toxicity

Product:

Toxicity to fish	: LC50: 126 mg/l, 96 h, QSAR, Aquatic toxicity is unlikely. (gaseous)
Toxicity to daphnia and other aquatic invertebrates.	: LC50: 62 mg/l, 48 h, Daphnia, QSAR, Aquatic toxicity is unlikely. (gaseous)
Toxicity to algae	: EbC50: 40,5 mg/l, 72 h, Growth inhibition : ErC50: 72,2 mg/l, 72 h, Growth inhibition : NOEC: 13,9 mg/l, 72 h
Toxicity to bacteria	: no data available
Toxicity to fish (Chronic toxicity)	: no data available
Toxicity to daphnia and other	: no data available

Ethylene

Version 12.2

Revision Date 21.10.2011

Print Date 24.10.2011

aquatic invertebrates.
(Chronic toxicity)

12.2 Persistence and degradability

Product:

Biodegradability : QSAR,
Readily biodegradable.

12.3 Bioaccumulative potential

Product:

Bioaccumulation : Bioaccumulation not expected: Partition coefficient (n-octanol/water) log Pow < 3.

12.4 Mobility in soil

Product:

Mobility : Soil:, Not expected to adsorb on soil., The product evaporates readily to air.
Environmental fate and pathways : Prone to photochemical degradation, reacting with OH radicals and ozone.

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).
: This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

12.6 Other adverse effects

Product:

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.

13. Disposal considerations

13.1 Waste treatment methods

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

14. Transport information

14.1 UN number

Ethylene

Version 12.2

Revision Date 21.10.2011

Print Date 24.10.2011

ADR : 1038
IMDG : 1038

14.2 Proper shipping name

ADR : ETHYLENE, REFRIGERATED LIQUID
IMDG : ETHYLENE, REFRIGERATED LIQUID

14.3 Transport hazard class

ADR : 2
IMDG : 2.1

14.4 Packing group

ADR
Hazard identification No : 223
Labels : 2.1
Tunnel restriction code : B/D
IMDG
EmS Number : F-D, S-U

14.5 Environmental hazards

ADR
Environmentally hazardous : no

IMDG
Marine pollutant : no

14.6 Special precautions for user

|| Other UN-Number: 1962 (ETHYLENE)

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Remarks : Not applicable

15. Regulatory information

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

Other regulations : no data available

15.2 Chemical Safety Assessment

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

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Ethylene

Version 12.2

Revision Date 21.10.2011

Print Date 24.10.2011

16. Other information

Full text of R-phrases referred to under sections 2 and 3

R12 Extremely flammable.
R67 Vapours may cause drowsiness and dizziness.

Full text of H-Statements referred to under sections 2 and 3.

H220 Extremely flammable gas.
H281 Contains refrigerated gas; may cause cryogenic burns or injury.
H336 May cause drowsiness or dizziness.

Further information

Other information : Changes since the last version are highlighted in the margin.
This version replaces all previous versions.

Issuer : Borealis, Group Product Stewardship / Mikaela Eriksson &
Andreas Ekholm

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>)
Environment Guide 71; Environmental properties of chemicals, Finnish Environment Institute, Helsinki 2000
IARC (International Agency for Research on Cancer) - Summaries & Evaluations, Ethylene, 60 (1994)
<http://www.inchem.org/documents/iarc/vol60/m60-01.html>
SIDS, Ethylene
(<http://www.inchem.org/documents/sids/sids/74851.pdf>)

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It is the customer's responsibility to inspect and test our products in order to satisfy itself as to the suitability of the products for the customer's particular purpose. The customer is responsible for the appropriate, safe and legal use, processing and handling of our products.

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SAFETY DATA SHEET
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Ethylene

Version 12.2

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