

MATERIAL SAFETY DATA SHEET

according to Regulation (EC) no. 1907/2006

ETHYLENE

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Product : ETHYLENE

Version : 1

Revised : 01/07/2013

Supersedes : 18/09/2009



F+ :
Extremely flammable

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

IDENTIFICATION OF THE SUBSTANCE

Trade name	ETHYLENE
Origin :	QATAR PETROCHEMICAL COMPANY DOHA - QATAR P.O. Box 756
Chemical name	ethylene
MATERIAL USE	monomer, Industrial applications : Polymerization, manufacture of Resins. Petrochemical industry : Plastics
Other	Ethylene is sold in two forms: 1) COMPRESSED ETHYLENE (distributed by pipeline) - UN number: 1962 2) REFRIGERATED LIQUID ETHYLENE (in tanks) - UN number: 1038

RESPONSIBLE FOR PLACING ON THE MARKET

Trade name of the firm sees below this page.

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2. Hazards identification

Dangerous substances	Ethylene
Main hazards	Extremely flammable
Target organs	Respiratory system.
Adverse human health effects	
Inhalation	narcotic in case of inhalation of high concentration of vapour
Ingestion	Ingestion during handling is not likely.
Skin	Contact with rapidly expanding gas may cause burns or frostbite.
eye	Contact with rapidly expanding gas may cause burns or frostbite.
Adverse environmental effects	Avoid losses to the environment whenever possible. (refer to point 12)
Adverse physicochemical effects	Spills or leaks may cause a high risk of fire and explosion. Flowing product can create electrostatic charge, resulting sparks may ignite or cause an explosion.

3. Composition / information on ingredients

chemical name	Ethylene
Synonym	Ethene
Chemical formula	C ₂ H ₄
Concentration (%)	> 99,9 percent by weight
CAS number	CAS: 74-85-1
EINECS or ELINCS number	EINECS: 200-815-3
Symbol(s)	F+
R Phrase(s)	12-67
Impurities contributing to hazard	Ethane and Methane maximum 1000 ppm
R Phrase(s) used	some of the components of this preparation are classified following the European directives and have risk phrases (R), but only their code are indicated in this rubric. you may find the full text of them in rubric 16.

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4. First-aid measures

General instructions

Warning! Extremely flammable gas

IN CASE OF HEAVY OR PERSISTENT DISTURBANCES, CALL A DOCTOR OR SEEK MEDICAL ADVICE URGENTLY

Route of exposure

-Inhalation

Remove the affected person to fresh air if necessary, give oxygen administer artificial respiration. Seek medical advice.

-Skin contact

Take off immediately all contaminated clothing flush immediately with plenty of water.

-Eye contact

Flush immediately with plenty of water.
Get medical advice (ophthalmologist)

-Ingestion

Seek specialist advice at hospital or medical centre

Protective equipment for first-aiders

If exposure is likely to exceed the occupational exposure limit, in a ventilated space, use approved respiratory protective equipment; in confined space, use an autonomous breathing apparatus.

5. Fire - fighting measures

Flammability of the product

Flammable

Auto-ignition temperature

425 to 543 without guarantee (refer to point 9)

Flash point(ASTM D 93) (°C)

-172 to -135

explosion limits (% vol)

upper: 32.000

Lower: 2.700

Technical measures

Stop all flow of gas before extinguishing fire. take precautionary measures against static discharge during blending and transfer operations.

Extinguishing media

Carbon dioxide (CO₂), dry chemicals, foam.

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Special exposure hazards	No smoking Avoid proximity or contact with hot surfaces, flames, electrostatic charges or sparks.
Special peril	Complete combustion, with an excess of oxygen forms: carbon dioxide (CO ₂) and water vapour. partial combustion, forms also: carbon monoxide (CO), soot and cracked products: aldehydes, ketones
Protective equipment for firefighters	Wear suitable breathing equipment, in case of risk of exposure to vapour or fumes.

6. Accidental release measures

refer to points 8 and 13

After spillage / leakage

Evacuate non-essential personnel.
Call the fire brigade immediately.
Avoid proximity or contact with hot surfaces, flames, electrostatic charges or sparks.
gaseous above -104 °C

on soil

The product evaporates into the atmosphere.

on water

The product evaporates into the atmosphere.

7. Handling and storage

HANDLING

Handle under adequate ventilation working has to be made only on cold, degassed and ventilated storage tanks. (risk of explosive atmosphere) never subject a cylinder to severe mechanical shock.

STOCKAGE

Use only containers, joints, pipes, etc...Made in a material suitable for use with either gaseous or liquefied hydrocarbons under pressure and at very low temperatures. Tanks should be grounded and provided with adequate pressure relief valve.
Store the cylinders outdoors and out of sunshine or other sources of radiation.
Keep in a well-ventilated place.
Keep away from sources of ignition - No smoking.

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Technical measures	Store away from heating source. Avoid static electricity build up with connection to earth.
Incompatible materials	avoid contact with strong oxidizing materials , air , O ₂ , NO _x , peroxides , halogens (Fluorine, Chlorine, Bromine, Iodine)
container	
Suitable	stainless steel, carbon steel
SPECIFIC USE(S)	no information available
refer to point 8	

8. Exposure controls / personal protection

Exposure controls

OCCUPATIONAL EXPOSURE LIMIT

Ethylene:
US (ACGIH-2009): TLV- 8h TWA: 200 ppm - 230 mg/m³
AU (2005): Asphyxiant
ACGIH A4 category: not classifiable as a human carcinogen.

EXPOSURE CONTROLS

Occupational exposure controls

Personal protection	local exhaust ventilation may be needed when working in a closed area
Respiratory protection	If exposure is likely to exceed the occupational exposure limit, use an autonomous breathing apparatus. filter protections : unauthorized
Skin and body protection	Cold-insulating gloves Shower and eye fountain available.
Eye protection	Do not wear contact lenses in any work area. goggles/spectacles
Other personal protection	where exposure is likely, protective clothing must be worn including gloves
Industrial health measures	Avoid producing or diffusing fumes, vapour or spray into the air.

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(particularly during loading or unloading product)
Do not store near food products.
do not wipe hands with cloths or rags which have been used for
Cleaning.
Environmental exposure controls unregulated

9. Physical and chemical properties

GENERAL INFORMATION

Physical state at 20°C gas (compressed gas)
Colour colourless
Odour ether

IMPORTANT HEALTH, SAFETY AND ENVIRONMENTAL INFORMATION

Change in physical state at 1013 hPa

Melting point	(°C)	-169
Initial boiling point	(°C)	-103,7
Critical temperature	(°C)	9,9 °C (Pressure = 5030 kPa)
Flash point (ASTM D 93)	(°C)	-172 to -135
Decomposition point	(°C)	700
Auto-ignition temperature	(°C)	425 to 543

the values of auto-ignition temperature are given without Guarantee.
indeed, these values vary widely depending on the source of Information.

Explosion limits	(% vol)	:
Upper		32,000
Lower		2,700
Vapour pressure at 20°C	(hPa)	44000

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Relative vapour density (air=1)	0,9 to 0,98
Density, mass (kg/m ³)	compressed liquefied gas 610 (T = 0°C) 570 (T = -103°C)
Behaviour with water at 20°C	insoluble
Solubility in water at 20°C (mg/l)	154 (T = 20°C) 200 (T = 10°C)
Soluble in	Hydrocarbons and organic solvents
Log P n-octanol / water at 20°C	1,21
pH value (concentrated product)	not applicable
Viscosity (mm ² /s)	not applicable (gas)
Molecular weight (kg/kmol)	28
Henry's constant (kPa.m ³ /mol)	21
OTHER INFORMATION	no information available

10. Stability and reactivity

Hazardous reactions	Extremely flammable In use, may form flammable / explosive vapour-air mixture. Hazardous polymerization may occur.
CONDITIONS TO AVOID	avoid proximity or contact with hot surfaces, flames, electrostatic Charges or sparks.
MATERIALS TO AVOID	avoid contact with strong oxidizing materials air , O ₂ , NO _x peroxides halogens (Fluorine, Chlorine, Bromine, Iodine)
Decomposition products	complete combustion, with an excess of oxygen forms: carbon dioxide (CO ₂) and water vapour. partial combustion, forms also: carbon monoxide (CO), soot and

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cracked products: aldehydes, ketones

11. Toxicological information

ACUTE TOXICITY

Inhalation in case of inhalation of high concentration of vapour: headache , drowsiness , loss of consciousness , asphyxia

LOCAL EFFECT

Inhalation in case of inhalation of high concentration of vapour: lachrymation and Irritating to respiratory system.

Eye contact irritation of ocular mucous membrane

CHRONIC TOXICITY

Studies of prolonged inhalation in animals have not shown chronic toxic effects.

no observed effect maximum dose / concentration : 11,6 mg/l : (rat) - 3 month

SPECIFIC EFFECTS

Genotoxicity

(According to available experimental data) : this product has been found to be non-genotoxic in in-vivo assays this product has been found to be non-genotoxic in in-vitro assays metabolites are genotoxic (ethylene oxide)

Carcinogenicity

(According to available experimental data) : Absence of carcinogenic effects in animals

12. Ecological information

Information on ecological effects

Avoid losses to the environment whenever possible.

MOBILITY

water / air

The product evaporates into the atmosphere.

water

Because of its high volatility, the product is unlikely to cause ground or water pollution.

PERSISTENCE AND DEGRADABILITY

Biodegradation

not readily biodegradable

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soil and sediments

adsorption is low : $\log K_{oc} = 2.7$

air

Product released into the atmosphere is expected to undergo degradation in the presence of sunlight.

half life

0,8 day(s)

BIOACCUMULATIVE POTENTIAL

potential bioaccumulation of the product in environment is very low : $\log Pow = 1.21$

ECOTOXICITY

AQUATIC TOXICITY

Acute toxicity

48 hours-EC50-Daphnia magna (mg/l)

53,4 - Harmful to aquatic organisms

OTHER ADVERSE EFFECTS

ozone precursor in lower atmosphere: POCP (Photochemical Ozone Creation Potential) = 100

13. Disposal considerations

Waste disposal

hazardous waste

Dispose in a safe manner in accordance with local/national regulations.

incineration

do not dispose off this product into the environment

Disposal of contaminated packaging

Dispose in a safe manner in accordance with local/national regulations.

All commercial cylinders must be returned to the supplier.

14. Transport information

Road (ADR) / Rail (RID)

UN Number

1962

Proper shipping name

ETHYLENE

Hazard identification number

23

Class

2

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classification code 2F
 Packing Group -
 Label(s) 2.1
 Code tunnel B/D



Transport on the Rhine (ADNR)

Identification number 1962
 Class 2
 classification code 2F
 Packing Group -
 Label(s) 2.1

Marine (IMO)

IMDG

UN Number 1962
 Class or division 2.1
 Subsidiary risk -
 Packing group -
 IMDG-Label(s) 2.1
 IMDG-Marine pollution no marine pollutant

Air transport (ICAO / IATA)

UN (or ID) Number 1962
 Class or division 2.1

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Subsidiary risk	-
Hazard Label(s)	Class 2 - Gases: Flammable (Division 2.1)
UN Packing group	-
Prescriptions	prohibited in passenger aircraft

15. Regulatory information

Labeling and Classification EC	Classification according to directives 67/548/EEC and 1999/45/EC. UK legislation: CHIP3 Chemicals (Hazard Information and Packaging for Supply) Regulations 2002
Symbol(s) EC	F+ : Extremely flammable
R Phrase(s)	R 12 :Extremely flammable. R 67 :Vapours may cause drowsiness and dizziness
S Phrase(s)	(S 2 :Keep out of reach of children.) 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 46 :If swallowed, seek medical advice immediately and show this container or label.
Other	refer to any national measures that may be relevant.
EINECS number	EINECS: 200-815-3
Annex I - number	Nr: 601-010-00-3
Germany	
Wassergefährdungsklasse	NWG: non-hazardous to waters
Registration	listed on the United States TSCA (Toxic Substances Control Act) inventory - CAS: 74-85-1 listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)- EEC Directive 79/831, sixth Amendment of the directive 67/548 (dangerous substances). listed on the Japanese ENCS (Existing & New Chemical Substances) inventory. nr: 2-12

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listed on the Canadian DSL (Domestic Substances List) inventory.
listed on the AICS (the Australian Inventory of Chemical Substances).
listed on the Korean ECL (Existing Chemical List) inventory. no:
KE-13226
listed on the Filipino PICCS (Philippine Inventory of Chemicals and
Chemical Substances) inventory.
listed on the swiss (liste des toxiques IGS/ IGS Giftliste 2003-2004)
inventory : Toxic category : 5- no: G-1172 (Ethylene)
listed on the People's Republic of China register: CRC-SEPA
(Chemical Registration Center for Chinese State Environmental
Protection Administration)

16. Other information

Training advice	The use of this product requires specific training. The user must receive all product information in order to handle the product safely (personal protection equipment and best practice standards)
Recommended uses and restrictions	Restricted to professional users
R Phrase(s) used	R 12 :Extremely flammable. R 67 :Vapours may cause drowsiness and dizziness

Safety data sheet conforms to the Regulation (EU) N° 1907/2006

This information applies to the PRODUCT AS SUCH and conforming to specifications of QATAR PETROCHEMICAL COMPANY.

In case of formulations or mixtures, it is necessary to ascertain that a new danger will not appear. The information contained is based on our knowledge of the product, at the date of publishing and it is given quite sincerely. However the revision of some data is in progress.

Users are advised of possible additional hazards when the product is used in applications for which it was not Intended. This sheet shall only be used and reproduced for prevention and security purposes. The references to legislative, regulatory and codes of practice documents cannot be considered as exhaustive.

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It is the responsibility of the person receiving the product to refer to the totality of the official documents concerning the use, the possession and the handling of the product.

It is also the responsibility of the handlers of the product to pass on to any subsequent persons who will come into contact with the product. (usage, storage, cleaning of containers, other processes) the totality of the information contained within this safety data sheet and necessary for safety at work, the protection of health and the protection of environment.

*There is No CHANGE in the MSDS contents regarding to the previous version.