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

Emergency Contact For Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night
Within USA and Canada: 1-800-424-9300 CCN724450
Outside USA and Canada: +1 703-741-5970 and
+1-703-527-3887 (collect calls accepted)

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
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: C2H4
- 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.
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.

- **Ingestion**
  Get medical advice (ophthalmologist)

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.
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 (CO2) 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.

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.
**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, O2, NOx, peroxides, halogens (Fluorine, Chlorine, Bromine, Iodine)

**container**

Stainless steel, carbon steel

**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.

**Other personal protection**

Goggles/spectacles

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.
(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
MATERIAL SAFETY DATA SHEET
According to Regulation (EC) no. 1907/2006

ETHYLENE

Product: ETHYLENE
Version: 1.1
Revised: 15/02/2018
Supersedes: 01/07/2013

Relative vapour density (air=1) 0,9 to 0,98
Density, mass (kg/m³) 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 (mm²/s) not applicable (gas)
Molecular weight (kg/kmol) 28
Henry's constant (kPa.m³/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, O2, NOx
peroxides
halogens (Fluorine, Chlorine, Bromine, Iodine)

Decomposition products complete combustion, with an excess of oxygen forms: carbon dioxide (CO₂) and water vapour.
partial combustion, forms also: carbon monoxide (CO), soot and
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**
no particular effect reported on man

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
soil and sediments adsorption is low: log Koc = 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

QAPCO - Qatar Petrochemical Company
P.O.BOX 756, Doha – Qatar
Main office: Doha
Tel: +974 424 2444
Fax: +974 432 4700
http://www.qapco.com.qa

MATERIAL SAFETY DATA SHEET
According to Regulation (EC) no. 1907/2006
ETHYLENE
Product: ETHYLENE
Version: 1.1
Revised: 15/02/2018
Supersedes: 01/07/2013
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
### 15. Regulatory information

<table>
<thead>
<tr>
<th>Labeling and Classification EC</th>
<th>Classification according to directives 67/548/EEC and 1999/45/EC. UK legislation: CHIP3 Chemicals (Hazard Information and Packaging for Supply) Regulations 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol(s) EC</td>
<td>F+ : Extremely flammable</td>
</tr>
<tr>
<td>R Phrase(s)</td>
<td>R 12 : Extremely flammable.</td>
</tr>
<tr>
<td></td>
<td>R 67 : Vapours may cause drowsiness and dizziness</td>
</tr>
<tr>
<td>S Phrase(s)</td>
<td>(S 2 : Keep out of reach of children.)</td>
</tr>
<tr>
<td></td>
<td>S 9 : Keep container in a well-ventilated place.</td>
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<tr>
<td></td>
<td>S 16 : Keep away from sources of ignition - No smoking.</td>
</tr>
<tr>
<td></td>
<td>S 33 : Take precautionary measures against static discharges.</td>
</tr>
<tr>
<td></td>
<td>S 46 : If swallowed, seek medical advice immediately and show this container or label.</td>
</tr>
<tr>
<td>Other</td>
<td>refer to any national measures that may be relevant.</td>
</tr>
<tr>
<td>EINECS number</td>
<td>EINECS: 200-815-3</td>
</tr>
<tr>
<td>Annex I - number</td>
<td>Nr: 601-010-00-3</td>
</tr>
<tr>
<td>Germany</td>
<td>NWG: non-hazardous to waters</td>
</tr>
<tr>
<td>Registration</td>
<td>listed on the United States TSCA (Toxic Substances Control Act) inventory - CAS: 74-85-1</td>
</tr>
<tr>
<td></td>
<td>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 &amp; New Chemical Substances) inventory, nr: 2-12</td>
</tr>
</tbody>
</table>
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 Giftiliste 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 |


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.

QAPCO - Qatar Petrochemical Company
P.O.BOX 756, Doha – Qatar
Main office: Doha
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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 except Updates on Emergency Contact Details.*