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2.1 : Flammable gases

**Danger**



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

### 1.1. Product identifier

Trade name : Ethylene  
 SDS no : WAG-055A  
 Chemical description : Ethylene  
 CAS No :74-85-1  
 EC No :200-815-3  
 Index No :601-010-00-3  
 Registration-No. : 01-2119462827-27-  
 Chemical formula : C2H4

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

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use.  
 Test gas/Calibration gas.  
 Laboratory use.  
 Chemical reaction / Synthesis.  
 Use as a fuel.  
 Contact supplier for more information on uses.

Uses advised against : Consumer use.


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

Company identification : Westfalen AG  
 Industrieweg 43  
 48155 MUENSTER Deutschland  
 Tel : 0049 2 51 6 95 0  
 Fax: 0049 2 51 6 95 1 94

E-Mail address (competent person) : sdb@westfalen-ag.de

### 1.4. Emergency telephone number

Emergency telephone number : Tel. (+49)551-19 24 0 (Giftinformationszentrum-Nord)

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## SECTION 2. Hazards identification

### 2.1. Classification of the substance or mixture

#### Hazard Class and Category Code Regulation EC 1272/2008 (CLP)

- Health hazards : Specific Target Organ Toxicity - Single exposure - Narcotic effects - Category 3 - Warning - (CLP : STOT SE 3) - H336
- Physical hazards : Flammable gases - Category 1 - Danger - (CLP : Flam. Gas 1) - H220  
Gases under pressure - Liquefied gas - Warning - (CLP : Press. Gas Liq.) - H280

#### Classification EC 67/548 or EC 1999/45

: F+; R12  
R67

### 2.2. Label elements

#### Labelling Regulation EC 1272/2008 (CLP)

#### • Hazard pictograms



#### • Hazard pictograms code

: GHS02 - GHS04 - GHS07

#### • 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

: P260EIGA - Do not breathe gas, vapours.  
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

##### - Response

: P304+P340+P315 - IF INHALED : Remove person to fresh air and keep comfortable for breathing. Get immediate medical advice / attention.  
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 - Store in a well-ventilated place.

### 2.3. Other hazards

: Contact with liquid may cause cold burns/frostbite.

## SECTION 3. Composition/information on ingredients

### 3.1. Substance / 3.2. Mixture

Substance.

Substance name	Contents	CAS No EC No Index No Registration no	Classification(DSD)	Classification(CLP)
Ethylene	: 100 %	74-85-1 200-815-3 601-010-00-3 01-2119462827-27-	F+; R12 R67	Flam. Gas 1 (H220) STOT RE 3 (H336) Press. Gas Liq. (H280)

Contains no other components or impurities which will influence the classification of the product.

\* 1: Listed in Annex IV / V REACH, exempted from registration.

\* 2: Registration deadline not expired.


\* 3: Registration not required: Substance manufactured or imported < 1t/y.

Full text of R-phrases see section 16. Full text of H-statements see section 16.

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### SECTION 3. Composition/information on ingredients (continued)

### SECTION 4. First aid measures

#### 4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- Skin contact : For liquid spillage - flush with water for at least 15 minutes.
- Eye contact : Adverse effects not expected from this product.
- Ingestion : Ingestion is not considered a potential route of exposure.

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

- : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/ consciousness. Victim may not be aware of asphyxiation.
- : In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.

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

- : None.

### SECTION 5. Firefighting measures

#### 5.1. Extinguishing media


- Suitable extinguishing media : Water spray or fog.  
Dry powder.
- Unsuitable extinguishing media : Do not use water jet to extinguish.  
Carbon dioxide.

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

- Specific hazards : Exposure to fire may cause containers to rupture/explode.
- Hazardous combustion products : Incomplete combustion may form carbon monoxide.

#### 5.3. Advice for fire fighters

- Specific methods : Move containers away from the fire area if this can be done without risk.  
If possible, stop flow of product.  
Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.  
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.  
Use water spray or fog to knock down fire fumes if possible.
- Special protective equipment for fire fighters : In confined space use self-contained breathing apparatus.  
Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.  
Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.  
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

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## SECTION 6. Accidental release measures

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

- : Consider the risk of potentially explosive atmospheres.
- Try to stop release.
- Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
- Ensure adequate air ventilation.
- Evacuate area.
- Eliminate ignition sources.
- Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
- Act in accordance with local emergency plan.
- Stay upwind.

### 6.2. Environmental precautions

- : Try to stop release.

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

- : Ventilate area.

### 6.4. Reference to other sections

- : See also sections 8 and 13.

## SECTION 7. Handling and storage

### 7.1. Precautions for safe handling

#### Safe use of the product

- : Only experienced and properly instructed persons should handle gases under pressure.
- The substance must be handled in accordance with good industrial hygiene and safety procedures.
- Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
- Take precautionary measures against static discharge.
- Purge air from system before introducing gas.
- Keep away from ignition sources (including static discharges).
- Do not smoke while handling product.
- Assess the risk of potentially explosive atmospheres and the need for explosion-proof equipment.
- Consider the use of only non-sparking tools.
- Ensure the complete gas system was (or is regularly) checked for leaks before use.
- Avoid suck back of water, acid and alkalis.
- Consider pressure relief device(s) in gas installations.
- Do not breathe gas.
- Avoid release of product into atmosphere.


#### Safe handling of the gas receptacle

- : Refer to supplier's container handling instructions.
- Do not allow backfeed into the container.
- Protect cylinders from physical damage; do not drag, roll, slide or drop.
- When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
- Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
- If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.
- Never attempt to repair or modify container valves or safety relief devices.
- Damaged valves should be reported immediately to the supplier.
- Keep container valve outlets clean and free from contaminants particularly oil and water.
- Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
- Close container valve after each use and when empty, even if still connected to equipment.
- Never attempt to transfer gases from one cylinder/container to another.
- Never use direct flame or electrical heating devices to raise the pressure of a container.
- Do not remove or deface labels provided by the supplier for the identification of the cylinder

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## SECTION 7. Handling and storage (continued)

contents.

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

- : Segregate from oxidant gases and other oxidants in store.
- Keep container below 50°C in a well ventilated place. Containers should be stored in the vertical position and properly secured to prevent them from falling over. Stored containers should be periodically checked for general condition and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere.
- Observe all regulations and local requirements regarding storage of containers.
- Containers should not be stored in conditions likely to encourage corrosion. Keep away from combustible materials.

### 7.3. Specific end use(s)

: None.

## SECTION 8. Exposure controls/personal protection

### 8.1. Control parameters

#### Occupational Exposure Limits

- Ethylene**
- : KZGW/VLE-CH [mg/m<sup>3</sup>] : 11500
  - : TWA (BE) OEL 8h [ppm] : 200
  - : TWA (BE) OEL 8h [mg/m<sup>3</sup>] : 233

#### DNEL: Derived no effect level (Workers)

- Ethylene**
- : Inhalation-short term (local) [mg/m<sup>3</sup>] : 230
  - : Inhalation-short term (systemic) [mg/m<sup>3</sup>] : 230

#### PNEC: Predicted no effect concentration

- Ethylene**
- : Aqua (freshwater) [mg/l] : 1.67
  - : Aqua (marine water) [mg/l] : 1.67

### 8.2. Exposure controls

#### 8.2.1. Appropriate engineering controls

- : Gas detectors should be used when flammable gases/vapours may be released. Consider work permit system e.g. for maintenance activities.
- Systems under pressure should be regularly checked for leakages.
- Provide adequate general and local exhaust ventilation.
- The substance is not classified for human health hazards or for environment effects and it is not PBT or vPvB so that no exposure assessment or risk characterisation is required. For tasks where the intervention of workers is required, the substance must be handled in accordance with good industrial hygiene and safety procedures.

#### 8.2.2. Individual protection measures, e.g. personal protective equipment

- : A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered:  
PPE compliant to the recommended EN/ISO standards should be selected.

##### • Eye/face protection

- : Wear safety glasses with side shields.
- Wear safety glasses with side shields or goggles when transfilling or breaking transfer connections.
- Standard EN 166 - Personal eye-protection.

##### • Skin protection


###### - Hand protection

- : Wear working gloves when handling gas containers.
- Standard EN 388 - Protective gloves against mechanical risk.
- Wear chemically resistant protective gloves.
- Standard EN 374 - Protective gloves against chemicals.
- The breakthrough time of the selected gloves must be greater than the intended use period.
- Consult glove manufacturer's product information on material suitability and material

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## SECTION 8. Exposure controls/personal protection (continued)

- |   |  |
|---|--|
| <p>- Other</p> <p>• Respiratory protection</p> <p>• Thermal hazards</p> <p>8.2.3. Environmental exposure controls</p> | <p>thickness.<br/>Neoprene rubber (HNBR)</p> <p>: Consider the use of flame resistant anti-static safety clothing.<br/>Standard EN ISO 14116 - Limited flame spread materials.<br/>Standard EN ISO 1149-5 - Protective clothing: Electrostatic properties.<br/>Wear safety shoes while handling containers.<br/>Standard EN ISO 20345 - Personal protective equipment - Safety footwear.</p> <p>: Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known.<br/>Recommended: Filter AX (brown).<br/>Consult respiratory device supplier's product information for the selection of the appropriate device.<br/>Gas filters do not protect against oxygen deficiency.<br/>Standard EN 14387 - Gas filter(s), combined filter(s) and full face mask - EN 136.</p> <p>: None necessary.</p> <p>: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.</p> |
|---|--|


## SECTION 9. Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

<b>Appearance</b>	
<b>Physical state at 20°C / 101.3kPa</b>	: Gas.
<b>Colour</b>	: Colourless.
<b>Odour</b>	: Sweetish. Poor warning properties at low concentrations.
<b>Odour threshold</b>	: Odour threshold is subjective and inadequate to warn of overexposure.
<b>pH value</b>	: Not applicable.
<b>Molar mass [g/mol]</b>	: 28
<b>Melting point [°C]</b>	: -169
<b>Boiling point [°C]</b>	: -103
<b>Critical temperature [°C]</b>	: 9.5
<b>Flash point [°C]</b>	: Not applicable for gases and gas mixtures.
<b>Evaporation rate (ether=1)</b>	: Not applicable for gases and gas mixtures.
<b>Flammability range [vol% in air]</b>	: 2.4 - 32.6
<b>Vapour pressure [20°C]</b>	: Not applicable.
<b>Relative density, gas (air=1)</b>	: 0.975
<b>Relative density, liquid (water=1)</b>	: 0.57
<b>Solubility in water [mg/l]</b>	: 130
<b>Partition coefficient n-octanol/water [log Kow]</b>	: 1.13
<b>Auto-ignition temperature [°C]</b>	: 425
<b>Viscosity at 20°C [mPa.s]</b>	: Not applicable.
<b>Explosive Properties</b>	: Not applicable.
<b>Oxidising Properties</b>	: None.

### 9.2. Other information

<b>Other data</b>	: None.
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## SECTION 10. Stability and reactivity

### 10.1. Reactivity

: No reactivity hazard other than the effects described in sub-sections below.

### 10.2. Chemical stability

: Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

: Can form explosive mixture with air.  
May react violently with oxidants.

### 10.4. Conditions to avoid

: Keep away from heat/sparks/open flames/hot surfaces. – No smoking.  
May decompose violently at high temperature and/or pressure or in the presence of a catalyst.

### 10.5. Incompatible materials

: Air, Oxidiser.  
For additional information on compatibility refer to ISO 11114.

### 10.6. Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11. Toxicological information

### 11.1. Information on toxicological effects

<b>Acute toxicity</b>	: No known toxicological effects from this product.
<b>Skin corrosion/irritation</b>	: No known effects from this product.
<b>Serious eye damage/irritation</b>	: No known effects from this product.
<b>Respiratory or skin sensitisation</b>	: No known effects from this product.
<b>Carcinogenicity</b>	: No known effects from this product.
<b>Germ cell mutagenicity</b>	: No known effects from this product.
<b>Reproductive toxicity</b>	: No known effects from this product.
<b>STOT-single exposure</b>	: In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.
<b>Target organ(s)</b>	: Central nervous system. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.
<b>STOT-repeated exposure</b>	: No known effects from this product.
<b>Aspiration hazard</b>	: Not applicable for gases and gas mixtures.

## SECTION 12. Ecological information

### 12.1. Toxicity


<b>EC50 48h - Daphnia magna [mg/l]</b>	: 62.4
<b>EC50 72h - Algae [mg/l]</b>	: 30.3
<b>LC50 96 h - fish [mg/l]</b>	: 126

### 12.2. Persistence and degradability

**Assessment** : The substance is biodegradable. Unlikely to persist.

### 12.3. Bioaccumulative potential

**Assessment** : Not expected to bioaccumulate due to the low log Kow ( log Kow < 4).  
Refer to section 9.

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## SECTION 12. Ecological information (continued)

### 12.4. Mobility in soil

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

### 12.5. Results of PBT and vPvB assessment

: Not classified as PBT or vPvB.

### 12.6. Other adverse effects

:  
 WGK0 - In general not hazardous for aquatic environment.  
 Effect on the ozone layer : None.  
 Effect on global warming : No known effects from this product.

## SECTION 13. Disposal considerations

### 13.1. Waste treatment methods

: Do not discharge into any place where its accumulation could be dangerous.  
 Do not discharge into areas where there is a risk of forming an explosive mixture with air.  
 Waste gas should be flared through a suitable burner with flash back arrestor.  
 Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.org> for more guidance on suitable disposal methods.  
 Ensure that the emission levels from local regulations or operating permits are not exceeded.

List of hazardous waste codes (from Commission Decision 2001/118/EC) : 16 05 04: Gases in pressure containers (including halons) containing dangerous substances.

### 13.2. Additional information

: None.

## SECTION 14. Transport information

### 14.1. UN number

UN number : 1962  
 Labelling ADR, IMDG, IATA



: 2.1 : Flammable gases


### 14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : ETHYLENE  
 Transport by air (ICAO-TI / IATA-DGR) : ETHYLENE  
 Transport by sea (IMDG) : ETHYLENE

### 14.3. Transport hazard class(es)

Transport by road/rail (ADR/RID)  
 Class : 2  
 Classification code : 2 F  
 H.I. nr : 23  
 Tunnel Restriction : B/D Tank carriage: Passage forbidden through tunnels of category B, C, D and E; Other carriage: Passage forbidden through tunnels of category D and E  
 Transport by air (ICAO-TI / IATA-DGR)



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#### SECTION 14. Transport information (continued)

Class / Division (Subsidiary risk(s)) : 2.1  
 Transport by sea (IMDG)  
 Class / Division (Subsidiary risk(s)) : 2.1  
 Emergency Schedule (EmS) - Fire : F-D  
 Emergency Schedule (EmS) - Spillage : S-U

##### 14.4. Packing group

Transport by road/rail (ADR/RID) : Not applicable.  
 Transport by air (ICAO-TI / IATA-DGR) : Not applicable.  
 Transport by sea (IMDG) : Not applicable.

##### 14.5. Environmental hazards

Transport by road/rail (ADR/RID) : None.  
 Transport by air (ICAO-TI / IATA-DGR) : None.  
 Transport by sea (IMDG) : None.

##### 14.6 Special precautions for user

Packing Instruction(s)  
 Transport by road/rail (ADR/RID) : P200  
 Transport by air (ICAO-TI / IATA-DGR)  
 Passenger and Cargo Aircraft : DO NOT LOAD IN PASSENGER AIRCRAFT.  
 Cargo Aircraft only : Allowed.  
 Packing instruction - Cargo Aircraft only : 200  
 Transport by sea (IMDG) : P200  
 Special precautions for user : Avoid transport on vehicles where the load space is not separated from the driver's compartment.  
 Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.  
 Before transporting product containers:  
 - Ensure that containers are firmly secured.  
 - Ensure cylinder valve is closed and not leaking.  
 - Ensure valve outlet cap nut or plug (where provided) is correctly fitted.  
 - Ensure valve protection device (where provided) is correctly fitted.  
 - Ensure there is adequate ventilation.

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

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not applicable.

#### SECTION 15. Regulatory information

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

###### EU legislation


Restrictions on use : None.  
 Seveso directive 96/82/EC : Listed.

###### National legislation

National legislation : Ensure all national/local regulations are observed.

##### 15.2. Chemical safety assessment

: A CSA has been carried out.  
 Refer to section 8.2.  
 An exposure assessment does not need to be carried out for this product.

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#### SECTION 15. Regulatory information (continued)

**Water-endangerment class Germany** : WGK0 - In general not hazardous for aquatic environment.

#### SECTION 16. Other information

- Indication of changes** : Revised safety data sheet in accordance with commission regulation (EU) No 453/2010.
- Training advice** : Ensure operators understand the flammability hazard.  
The hazard of asphyxiation is often overlooked and must be stressed during operator training.
- Further information** : This Safety Data Sheet has been established in accordance with the applicable European Union legislation.
- List of full text of R-phrases in section 3.** : R12 : Extremely flammable.  
R67 : Vapours may cause drowsiness and dizziness.
- List of full text of H-statements in section 3.** : H220 - Extremely flammable gas.  
H280 - Contains gas under pressure; may explode if heated.  
H336 - May cause drowsiness or dizziness.
- DISCLAIMER OF LIABILITY** : Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.  
Details given in this document are believed to be correct at the time of going to press. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

**End of document**