# MATERIAL SAFETY DATA SHEET (MSDS)
# ETHYLENE
## (Please ensure that this MSDS is received by the appropriate person)

Ref. no.: MS058 DATE: December 2015
Version no.2

## 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

| | |
|---|---|
| Product Name | ETHYLENE |
| Chemical Formula | $C_2H_4$. |
| Trade Name | Ethylene |
| Colour Coding | Purple body with a Red (A.11) shoulder. |
| Valve | Neriki – Brass 5/8-inch BSP left hand and female valve |
| Company Identification | African Oxygen Limited<br>23 Webber Street<br>Johannesburg, 2001<br>Tel. No: (011) 490-0400<br>Fax No: (011) 490-0506 |
| **EMERGENCY No** | **0860020202 (24 hr)** |

## 2 COMPOSITION/INFORMATION ON INGREDIENTS

| | |
|---|---|
| Chemical Name | Ethylene |
| Chemical Family | Unsaturated hydrocarbon |
| CAS No. | 74-85-1 |
| UN No. | 1962 |
| ERG No. | 116P |
| Hazchem Warning | 2 A Flammable gas |

## 3 HAZARDS IDENTIFICATION

**Main Hazards.** All Cylinders are portable gas containers, and must be regarded as pressure vessels at all times. The hazardous properties of Ethylene are its flammability, and its potential to cause asphyxia by displacement of air, with the resultant lowering of the oxygen content below that necessary to support life.

**Adverse Health effects.** Prolonged inhalation of substantial concentrations results in unconsciousness; light and moderate anaesthesia is attained, and deep anaesthesia seldom occurs. Inhalation is fatal only if the gas acts as a simple asphyxiant, depriving the body of necessary oxygen. Direct contact with liquid form can cause frostbite and freeze-burns in exposed tissues.

**Chemical hazards.** No hazardous decomposition compounds formed.

**Biological Hazards.** No deleterious action by Ethylene on circulatory, respiratory, or other systems or organs has been observed. Exhalation eliminates the major portion of Ethylene within minutes, although complete de-saturation from body fat takes several hours.

**Vapour Inhalation.** Effects of oxygen deficiency resulting from simple asphyxiants may include: rapid breathing, diminished mental alertness, impaired muscular co-ordination, faulty judgement, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma, and death.

**Eye contact.** The gas has no known effect. Contact with evaporating liquid may cause tissue freezing.

**Skin contact.** Contact with rapidly evaporating liquid can cause cryogenic "burns" or frostbite. Frostbite effects are a change in colour of the skin to grey or white, possibly followed by blistering.

**Ingestion.** None known. Ingestion is unlikely.

**Labelling Elements**

Hazard Pictogram

| | |
|---|---|
| Signal Word: | Danger |
| Hazard Statements: | |
| H220: | Extremely flammable gas |
| H336 | may cause drowsiness or dizziness |

Precautionary Statements:

| | |
|---|---|
| P210: | Keep away from heat/spark/open flames/hot surfaces – No smoking |
| P261: | Avoid breathing gas/ vapours |
| P271: | Use only outdoors or in well ventilated areas |
| P312: | Call POISON CENTRE or doctor/physician if feeling unwell |
| P377: | Leaking gas fire: do not extinguish unless leak can be stopped safely |
| P381: | Eliminate all ignition sources if safe to do so |
| P304 + P340: | IF INHALED: remove to fresh air and keep at rest in a position comfortable for breathing |
| P403 + P233: | Store in a well-ventilated place and keep the container tightly closed. |
| P405: | store locked up |
| P501: | Dispose container safely ( see section 13) |

## 4 FIRST AID MEASURES

Prompt medical attention is mandatory in all cases of overexposure to Ethylene. Rescue personnel should be equipped with self-contained breathing apparatus. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. If breathing has stopped administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive. Keep patient warm and quiet.

**Eye contact.** In case of cryogenic burns caused by evaporating liquid, do not apply ointment or oil into the eyes without medical advice. Do not wash the eyes with hot or even tepid water. Remove victim from the source of contamination. Open eyelids wide to allow liquid to evaporate. If pain is present, refer the victim to an ophthalmologist for treatment and follow up. If the patient cannot tolerate light, protect the eyes with a light bandage.

**Skin contact.** For dermal contact or frostbite, flush affected area with lukewarm water. Do not use hot water. A physician should see the patient promptly if the cryogenic "burn" has resulted in blistering of the dermal surface, or deep tissue freezing.

## 5 FIRE FIGHTING MEASURES

**Extinguishing media.** Carbon dioxide, dry chemical or water spray.

**Specific hazards.** Highly flammable. May form explosive gas mixtures with air. Is a simple asphyxiant.

**Emergency actions.** If possible, shut off gas flow at source. Evacuate area. Post warnings to prevent persons from approaching with lit cigarettes or open flames. Using water, keep all cylinders in the vicinity of the fire cool. Remove cylinders from the vicinity of the fire if possible. CONTACT THE NEAREST AFROX BRANCH.

**Protective clothing.** Exposed fire fighters should wear approved self-contained breathing apparatus with full face mask. Safety gloves and safety shoes or boots should be worn when handling cylinders.

**Environmental precautions.** As the gas is lighter than air, ensure that it is not trapped in confined spaces. This could lead to the formation of a highly explosive gas-air mixture. Ventilate all confined spaces using forced-draught if necessary. Ensure that all electrically powered equipment is flameproof.

## 6 ACCIDENTAL RELEASE MEASURES

**Personal precautions.** As Ethylene is a simple asphyxiant care should be taken when entering confined spaces where leaks have occurred. Do not enter any potentially hazardous area with any source of ignition, such as a lit cigarette or match.

**Environmental precaution.** Ethylene does not pose a hazard to the environment. An explosive gas-air mixture could be formed when leaks occur, so eliminate all forms of ignition.

**Small spills.** Small leaks should be extinguished by shutting off the source of supply, e.g. closing the valve on the cylinder, or tightening the gland nut where appropriate. If unable to stop small leaks the cylinder should be moved into the open, well

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away from any source of ignition. Should a small leak have ignited, use a multi-purpose dry powder or carbon dioxide extinguisher. Should there be no extinguisher available, a welder's glove or heavy cloth, soaked in water, may be used to extinguish the flame.

**Large spills.** Stop the source if it can be done without risk. Eliminate all sources of ignition and static discharges. Restrict access to the area until completion of the clean-up procedure. Post-relevant warning signs. Wear adequate protective clothing when working near the source of the leak. Ventilate the area using forced draught if necessary. Ensure that all equipment is flameproof.

### 7 HANDLING AND STORAGE

Do not allow cylinders to slide or come into contact with sharp edges. Ethylene cylinders may be stacked horizontally provided that they are firmly secured at each end to prevent rolling. Ensure that equipment is adequately earthed. Conspicuous signs should be posted in the storage area forbidding smoking or the use of naked lights. Use the "first in - first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Compliance with all relevant legislation is essential. Keep away from children.

### 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

**Occupational exposure hazards.** Except for its flammability, and its property of causing asphyxiation by lowering the oxygen content of the atmosphere, Ethylene is not hazardous. Its maximum permissible limit in workroom air should not exceed 5 500 ppm, 20% of the lower flammable limit.

**Engineering control measures.** Engineering control measures are preferred to reduce exposures. General methods include mechanical ventilation, process or personal enclosure, and control of process conditions. Administrative controls and personal protective equipment may also be required. Use a suitable flameproof ventilation system separate from other exhaust ventilation systems. Exhaust direct to outside supply sufficient replacement air to make up for air removed by exhaust system.

**Personal protection.** Use self-contained breathing apparatus when fighting large fires.

**Eyes.** Use safety glasses when working with cylinders.

**Hands.** Use suitable protective gloves when working with cylinders.

**Feet.** Wear protective footwear when working with cylinders.

**Skin.** No known effect.

### 9 PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL DATA**

| | |
|---|---|
| Chemical Symbol | $C_2H_4$ |
| Molecular Weight | 28,054 |
| Specific volume @ 20°C & 101,325 kPa | 858,3 ml/g |
| Relative density of gas @ 101,325 kPa (Air=1) | 0,908 |
| Critical temperature | 9,9°C |
| Flammability limits in air | 3,1 - 32,0% (by vol) |
| Autoignition temperature | 490°C |
| Colour | None |
| Taste | Sweet |
| Odour | Musty |

### 10 STABILITY AND REACTIVITY

**Conditions to avoid.** Overheating of cylinders. Keep sparks and flames away from cylinder, and under no circumstances allow a torch flame to come into contact with any part of the cylinder. Never test for leaks with a flame. Use soapy water when testing for leaks. Never use cylinders as rollers or supports, or for any other purposes other than the storing of Ethylene.

**Incompatible materials.** Ethylene is non-corrosive and may be contained in ambient temperatures by most common metals used in installations designed to have sufficient strength for the working pressures involved.

**Hazardous Decomposition Products.** No hazardous compounds are formed when Ethylene/air mixtures are completely combusted.

### 11 TOXICOLOGICAL INFORMATION

| | |
|---|---|
| Acute Toxicity | No known effect. |
| Skin & eye contact | No known effect. |
| Chronic Toxicity | No known effect. |
| Carcinogenicity | No known effect. |
| Mutagenicity | No known effect. |
| Reproductive Hazards | No known effect |

### 12 ECOLOGICAL INFORMATION

As Ethylene is lighter than air it will disperse rapidly in open areas. It does not pose a hazard to the ecology.

### 13 DISPOSAL CONSIDERATIONS

**Disposal Methods.** Small amounts may be blown to the atmosphere under controlled conditions. No sources of ignition should be in the vicinity. Large amounts should only be handled by the gas supplier.

**Disposal of packaging**. The gas supplier must only handle the disposal of containers.

### 14 TRANSPORT INFORMATION

**ROAD TRANSPORTATION**

| | |
|---|---|
| UN No. | 1962 |
| Class | 2.1 |
| Danger group | Flammable gas |
| ERG No | 116P |
| Hazchem warning | 2 A Flammable gas |

**SEA TRANSPORTATION**

| | |
|---|---|
| IMDG | 1962 |
| Class | 2.1 |
| Label | Flammable toxic gas |

**AIR TRANSPORTATION**

| | |
|---|---|
| ICAO/IATA Code | 1962 |
| Class | 2.1 |
| Subsidiary risk | Flammable gas |
| Packaging instructions | |
| - Cargo | 200 |
| - Passenger | Forbidden |
| Maximum quantity allowed | |
| - Cargo | 150 kg |
| - Passenger | Forbidden |

### 15 REGULATORY INFORMATION

EEC Hazard class Flammable gas
National legislation OHSact and Regulations 85 of 1993
SABS 10234 and its supplement for explanation of the above.

### 16 OTHER INFORMATION

Bibliography
Compressed Gas Association, Arlington, Virginia
Handbook of Compressed Gases - 3rd Edition
Matheson. Matheson Gas Data Book - 6th Edition
SABS 0265 - Labelling of Dangerous Substances

### 17 EXCLUSION OF LIABILITY

Information contained in this publication is accurate at the date of publication. The company does not accept liability arising from the use of this information, or the use, application, adaptation or process of any product described herein.

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