

# MATERIAL SAFETY DATA SHEET

## R11

### 1. PRODUCT AND COMPANY IDENTIFICATION

Product Name R11  
Trade Names R11  
Company Identification:  
African Oxygen Limited  
23 Webber Street  
Johannesburg  
Tel No: (011) 490 0400  
Fax No: (011) 490 0506

### 2. COMPOSITION /INFORMATION ON

#### INGREDIENTS

Product Name R11  
Other Name Trichlorofluoromethane, CFC11  
Product Code 161, 811  
UN No: 1078  
ERG No: 126  
Dangerous Goods: 2.2  
Hazchem Code: 2RE  
Use: Refrigeration systems for air conditioning  
Application method: Transferred as a liquid in and out of refrigeration equipment by controlled pressure decanting through flexible pipe-work.

### 3. HAZARD IDENTIFICATION

**Main Hazards.** All cylinders are portable gas containers, and must be treated as pressure vessels at all times. Uncontrolled release of compressed gas may cause physical injuries. Cylinders should never be exposed to excessive temperatures as this may cause rupturing of the cylinders with escape of the gas. Uncontrolled release of compressed gas may cause physical injuries.

**Health Effects:** LC 50 rat 26.200 vppm 4 hours.

**Swallowed:** Unlikely exposure route. If swallowed discomfort in the gastrointestinal tract would result from rapid evaporation of liquid and consequent evolution of gas. Some of the effects of inhalation

would be expected. Necrosis from freezing of tissue could occur.

**Eye:** May cause irritation and cold burns.

**Skin:** May cause irritation and cold burns.

**Inhaled:** May replace oxygen in the inhaled air and cause asphyxiation. As the amount of oxygen inhaled is reduced from 21 to 14 volume % the pulse rate will accelerate and the rate and volume of breathing will increase. The ability to maintain attention and think clearly is diminished, muscular co-ordination is somewhat disturbed. As oxygen decreases from 14 to 10 volume % judgment becomes faulty, severe injuries may cause no pain. Muscular effort leads to rapid fatigue. Prolonged exposure to high concentrations may result in sensitization to the effects of adrenalin on the heart. Further reduction to 6% may cause nausea and vomiting. Ability to move may be lost. Permanent brain damage may result even after resuscitation from exposure to this low level of oxygen. Below 6% breathing is in gasps and convulsions may occur. Inhalation of a mixture containing no oxygen may result in unconsciousness from the first breath and death will follow in a few minutes.

**Chronic:** Thought to be mutagenic and teratogenic. Women of childbearing age should have exposure limited.

### 4. FIRST-AID MEASURES

Rescue personnel must use self-contained breathing apparatus when entering confined spaces and poorly ventilated areas.

**Ingestion:** Do not induce vomiting without medical advice. Call a physician immediately.

**Eyes:** Rinse immediately with plenty of water for at least 15 minutes. Keep eye wide open while rinsing. If

symptoms persist, call a physician.

**Skin:** Liquefied gas may cause frostbite. Wash frostbitten areas with warm water. Do not remove clothing. Wash off with warm water. If skin irritation persists, call a doctor.

**Inhalation:** Move to fresh air in case of accidental inhalation of vapours. Oxygen or artificial respiration if needed. Keep warm and rested. Seek medical attention. Further treatment be symptomatic and supportive.

**Advice to Doctor:** Use of adrenaline and other catecholamine may be contraindicated due to possible cardiac sensitization. Treatment for asphyxia.

**General advice:** Consult a physician after significant exposure.

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## 5. FIRE FIGHTING MEASURES

The product itself does not burn. Extinguish with carbon dioxide, dry chemical, foam or water spray.

### Specific hazards:

Hazardous decomposition products such as hydrogen fluoride and hydrogen chloride may be formed. Call fire brigade. Cool cylinders exposed to fire by applying water from a protected location. Do not approach cylinders suspected of being hot. Remove cool cylinders the path of the fire. Evacuate the area if unable to keep cylinders cool.

### Special protective equipment for fire fighters:

In case of fire, wear a self-contained breathing apparatus.

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## 6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Use personal protective equipment. Evacuate personnel to safe areas. Do not breathe vapours or spray mist. Ensure adequate ventilation.

**Spills and disposal:** Always ensure cylinder pressure is below equipment pressure rating and any relief valve setting. In an emergency allow gas to escape to escape to atmosphere, preferably in a well ventilated, remote area. Remove sources of ignition. Local ventilation may be required in confined spaces and

low lying areas depending on amount of product released. Contact nearest BOC/Afrox Gases center for guidance. Leak checking may be done by pressure drop test or by using soapy water on outlets and outlets. Shut cylinder valve to stop gas leaks from equipment if possible and safe to do so. If cylinder or cylinder valve is leaking then shut the cylinder valve, depressurize the equipment, disconnect cylinder from equipment and move the cylinder to a well ventilated area, preferably outdoors, and allow gas to escape. Never attempt to repair a leaking or damaged cylinder valve. Notify the nearest BOC/ AFROX Gases center that you will be returning a faulty cylinder. Residual product will be disposed of when the cylinder is returned.

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## 7. HANDLING AND STORAGE

**Handling:** Keep away from heat, sources of ignition. Do not puncture or drop container.

**Storage:** Keep containers tightly closed in a cool, well ventilated place. Store in cool well shaded area. When transporting, disconnect hoses. Cylinders should be stored upright, prevented from falling, in a secure area away from flammable or combustible materials. Store below 45 deg C, in a dry, well ventilated area constructed of non-combustible materials with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits.

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure Standards:** Worksafe exposure standard is 1 000 vpm. Worksafe exposure standard for decomposition product hydrogen fluoride is 3 vpm.

### Engineering measures to reduce exposure:

Securely connect decanting control equipment having suitable pressure and flow rating with connection to match cylinder valve outlet. Never allow oil or grease on cylinder valves. Cylinders should be positioned in a well ventilated areas, preferably outside a building. Mechanical lifting devices and trolleys should be used to lift and move cylinders. Personal injury and mechanical damage to cylinder valve and connected

equipment may result falling cylinders: secure cylinders against falling at all times, especially when in use. Ensure cylinder valve is shut and equipment depressurized and purged with inert gas before commencing maintenance and repairs. Any source of ignition such as lighted cigarette, flames, hot spots and welding may produce toxic and corrosive decomposition products.

**Personal Protection:** Avoid contact with escaping gas or liquid. Only experienced and properly trained people should use this product. Wear safety goggles, safety shoes, use impervious nitrile gloves when moving, connecting and operating cylinders. Open cylinder valve slowly to avoid pressure shock and close when not in use.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Water white volatile liquid with a slight ethereal odour.

Boiling point/range (deg. C at 101.32 kPa): 23.8

Vapour pressure (at 25 deg C): 110 kPa

Relative density (0 deg C, 1013 kPa, Air = 1): 4.9

Water solubility (101.32 kPa 20 deg C): 0.145 cm<sup>3</sup>/cm<sup>3</sup>

Flashpoint (deg C): Non-flammable

Lower flammability limit (%): Non-flammable

Upper flammability limit (%): Non-flammable

Liquefiable gas, critical temperature deg. C: 198

Critical pressure kPa: 4410

Material compatibility: May react violently with sodium, potassium, barium and other alkali or alkaline earth metals and finely divided metals. Compounding ingredients in natural rubber can be extracted during rapid liquid withdrawal and will swell.

CAS Nr. 75-69-4

Proportion (%): 99.9 minimum

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## 10. STABILITY AND REACTIVITY

**Stability:** stable at normal condition. No decomposition if stored and applied as directed.

Conditions to avoid: fire or intense heat may cause violent rupture of packages. Do not exposure to temperatures above 50 C.

Materials to avoid: May react violently with sodium, potassium, barium and other alkali or alkaline earth metals and finely divided metals.

Hazardous decomposition products: hydrogen fluoride and hydrogen chloride.

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## 11. TOXICOLOGICAL INFORMATION

**Health Effects:** LC 50 rat 26.200 ppm 4 hours.

### **Irritation:**

**Skin:** slightly irritating. May cause frostbite.

**Eyes:** slightly irritating.

**Chronic toxicity:** Thought to be mutagenic and teratogenic.

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## 12. ECOLOGICAL INFORMATION

Covered by the 'Montreal Protocol'. May have damaging effects on ozone layer. When discharged in large quantities may contribute to the greenhouse effect.

Ozone depletion factor: 1

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## 13. DISPOSAL CONSIDERATION

Waste from residues/unused products: Offer surplus and non-recyclable solutions to an established disposal company. In accordance with local and national regulations. S59 – Refer to manufacture/supplier for information on recovery/recycling.

Contaminated packaging: Do not reuse containers.

Empty pressure vessels should be returned to the supplier.

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## 14. TRANSPORT INFORMATION

Ensure cylinder is separated from driver and that outlets of relief device is not obstructed.

Shipping name: Refrigerant gas, N.O.S. (contains trichloromethane)

Transport E.P.G. card: 2C2.

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## 15. REGULATORY INFORMATION

Keep container tightly closed and in a well-ventilated place.

Do not breathe gas.

Do not release into the atmosphere.

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## 16. OTHER INFORMATION

Ensure all national/ regulations are observed.

Asphyxiant in high concentrations. Keep container in

well-ventilated place. Do not breathe the gas. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Users of breathing apparatus must be trained. Contact with liquid may cause cold burns/frostbite.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Details given in this document are believed to be correct at the time of publication. 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.

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#### **17. EXCLUSION OF LIABILITY**

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