AFROX
A Member of The Linde Group

MATERIAL SAFETY DATA SHEET

C0-CAl_GAS_STANDARDS

(Please ensure that this MSDS is received by the appropriate person)

DATE: July 2011 **Version 2**

Ref No.: MS052

1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Product Name	Carbon Monoxide/Air calibration gas standards
Chemical Formula	CO plus O2 plus N2
Trade Names	CO –CAL 85 (75 – 85) CO – CAL 100 (105 – 120) CO –CAL 150 (150 – 180) CO – CAL 400 (410- 450) CO CAL 450 (450 – 480) The above figures in brackets indicate the tolerances of these mixtures in vpm CO. The actual concentrations would be indicated on the analytical certificates attached to the cylinders.
Colour Coding	Silver body with a Red (A.11) shoulder and Yellow circular band just below the Red shoulder. The relevant "CO – CAL" decal shall be affixed centrally on the body of the cylinder
Valve	3SH – Brass, 5/8 inch left hand female. N.B. ONLY aluminium cylinders are used for the above calibration gas mixtures
Company Identification	African Oxygen Limited 23 Webber Street Johannesburg, 2001 Tel. No: (011) 490-0400 Fax No: (011) 490-0506
Emergency phone No	**0860111185or 0118734382 (24hr)**

2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Names	Carbon monoxide plus oxygen plus nitrogen
UN No.	1955
ERG No	119
Hazchem Warning	2 A Flammable Gas.

3 HAZARDS IDENTIFICATION

Main Hazards. All Cylinders are transportable gas containers, The carbon monoxide component of the above gas is a chemical asphyxiant.

Adverse Health effects. Concentrations in excess of 50 ppm carbon monoxide will produce symptoms of poisoning if breathed for a sufficiently long time.

Biological Hazards. None.

Vapour inhalation. Carbon monoxide combines with the haemoglobin in the blood to form carboxyhaemoglobin, which is unable to transport oxygen. The symptoms of carbon monoxide poisoning are largely due to anoxia.

Eye Contact. No known effect.

Skin Contact. No known effect.

Ingestion. (See "Vapour Inhalation" above).

4 FIRST AID MEASURES

Conscious persons should be assisted to an uncontaminated area and be treated with supplemental oxygen. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, and given artificial respiration and oxygen at the same time. The administration of the oxygen at an elevated pressure (up to 2 to 2.5 atmospheres), has shown to be beneficial, as has treatment in a hyperbaric chamber. The physician should be informed that the patient has inhaled toxic quantities of carbon monoxide. Prompt medical attention is mandatory in all cases of overexposure to carbon monoxide. Rescue personnel should be equipped with self-contained breathing apparatus.

Eye contact No known effect.

Skin contact No known effect.

Ingestion (See Section 3 above)

5 FIRE FIGHTING MEASURES

Extinguishing media. As these listed gas standards are non- flammable, but will support combustion, the correct type of extinguishant should be used depending on the combustible material involved.

Specific hazards. The possibility of inhaling excessive amounts of carbon monoxide.

Emergency actions. All cylinders should be removed from the vicinity of the fire. Cylinders that cannot be removed should be cooled with water from a safe distance. Cylinders which have been exposed to excessive heat should be clearly identified and returned to supplier. CONTACT THE NEAREST AFROX BRANCH.

Protective clothing. Safety goggles, gloves and safety shoes should be worn when handling cylinders.

Environmental precautions. None.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions. Ensure that the surrounding atmosphere is safe before entering an area where large volumes of CO-Cal have been released.

Environmental Precautions. The gas standards do not pose a hazard to the environment.

Small spills. No known effect.

Large spills Beware of the possible increase in the levels of carbon monoxide.

7 HANDLING AND STORAGE

Do not allow cylinders to slide or come into contact with sharp edges. Cylinders of CO-Cal should not be stored near cylinders of acetylene or other combustible gases. CO-Cal cylinders may be stacked horizontally provided that they are firmly secured at each end to prevent rolling. Prevent dirt, grit of any sort, oil or any other lubricant from entering the cylinder valves, and store cylinders well clear of any corrosive influence, e.g. battery acid. Compliance with all relevant legislation is essential. Use the "first-in first-out" inventory system to prevent full cylinders from being stored for excessive periods of time. Keep out of reach of children.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure hazards.

Prolonged exposure to low concentrations of CO-Cal may cause permanent harmful effects.

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.

Skin contact. No known effect.

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9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

Carbon Monoxide	
Chemical Symbol	CO
Molecular Weight	28,01
Specific volume @ 20°C & 101,325 kPa	858 ml/g
Relative density of gas @ 101,325 kPa (Air=1)	0,967
Colour	None
Taste	None
Odour	None
Nitrogen	
Chemical Symbol	N_2
Molecular Weight	28,013
Specific volume @ 20°C & 101,325 kPa	861,5 ml/g
Relative density of gas @ 101,325 kPa (Air=1)	0,967
Colour	None
Taste	None
Odour	None
Oxygen	
Chemical Symbol	O_2
Molecular Weight	32,00
Specific volume @ 20°C & 101,325 kPa	755 ml/g
Relative density of gas @ 101,325 kPa (Air=1)	1,053
Colour	None
Taste	None
Odour	None

10 STABILITY AND REACTIVITY

Conditions to avoid. The build up of CO-Cal in the atmosphere to potentially hazardous concentrations.

Incompatible materials. As dry CO-Cals are inert they may be contained in systems constructed of any of the common metals which have been designed to safely withstand the pressures involved.

Hazardous Decomposition Products. None.

11 TOXICOLOGICAL INFORMATION

Acute Toxicity	TLV 50 vpm (8 hr)
Skin & eye contact	No known effect
Chronic Toxicity	No known effect
Carcinogenicity	No known effect
Mutagenicity	No known effect
Reproductive Hazards	No known effect

(For further information see Section 3. Adverse Health Effects)

12 ECOLOGICAL INFORMATION

These gas standards do not pose a hazard to the ecology.

13 DISPOSAL CONSIDERATIONS

Disposal Methods. Small amounts may be blown to the atmosphere under controlled conditions. Large amounts should only be handled by the gas supplier.

Disposal of packaging. The disposal of containers must only be handled by the gas supplier.

14 TRANSPORT INFORMATION

ROAD TRANSPORTATION

UN No.	1955
ERG No	119
Hazchem warning	2 A Flammable gas
SEA TRANSPORTATION	
IMDG	1955
Class	2.3
Subsidiary risk	Chemical asphyxiant
Label	Toxic gas
AIR TRANSPORTATION	
ICAO/IATA Code	1955
Class	2.3
Packaging instructions	
- Cargo	Forbidden
- Passenger	Forbidden
Maximum quantity allowed	
- Cargo	Forbidden
- Passenger	Forbidden

15 REGULATORY INFORMATION

EEC Hazard class	Toxic gas
Risk phrases	R20 Harmful by inhalation R23 Toxic by inhalation R44 Risk of explosion if heated under confinement
Safety phrases	S2 Keep out of reach of children S9 Keep container in a well-ventilated place S15 Keep away from heat S38 In case of insufficient ventilation, wear suitable respiratory equipment S44 If you feel unwell, seek medical advice. (Show label where possible) S51 Use only in well-ventilated areas
National legislation	None

Refer to SABS 0265 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

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For product and safety enquiries please phone

0860020202 (24 hr)