

MATERIAL SAFETY DATA SHEET
29 CFR 1910.1200 OSHA Hazard
Communication Rule Format
Chem-Tel 24 Hour Emergency # 1-800-255-3924

MINE SAFETY APPLIANCES COMPANY
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This product contains carbon monoxide, methane, hydrogen sulfide, oxygen, carbon dioxide and nitrogen, substances subject to the Pennsylvania Worker and Community Right-To-Know Act.

PRODUCT IDENTITY

LABEL IDENTITY - MSA P/N 10104621 Calibration check gas, 60 ppm Carbon Monoxide, 1.45% Methane, 15% Oxygen, 2.5% Carbon Dioxide, 20 ppm Hydrogen Sulfide, and balance Nitrogen.

CHEMICAL NAME - Carbon Monoxide, Methane, Oxygen, Hydrogen Sulfide, Carbon Dioxide, Nitrogen Mixture

ADDITIONAL IDENTITIES - MSA P/N 10103262 Calibration Gas

FORMULA - $\text{CO} + \text{CH}_4 + \text{O}_2 + \text{CO}_2 + \text{H}_2\text{S} + \text{N}_2$

APPLICABLE CHEMICAL CONTENTS

	<u>%</u>	<u>TWA</u>	<u>OSHA</u>
Carbon Monoxide (CAS 630-08-0) (ACGIH 2010)	0.006	25 ppm	PEL TWA 50ppm
Methane (CAS 74-82-8)	1.45	1000 ppm*	
Carbon Dioxide (CAS 124-38-9)	2.5	5000ppm	PEL 5000 ppm
Oxygen (CAS 7782-44-7)	15	None	
Hydrogen Sulfide (CAS 7783-06-4) (ACGIH 2010)	0.0020	1 ppm	PEL C20ppm
Nitrogen (CAS 7727-37-9)	Balance	None	
*Methane as an alkane (ACGIH 2010)			

NOTE: Gas under pressure, 500 PSIG at 70°F, Approx. 34 Liters gas at atmospheric pressure

PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR - Colorless, malodorous gas

Following information is for Nitrogen the main component of this gas mixture

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BOILING POINT - -320.4°F (-195.8 °C) **SPECIFIC GRAVITY (air = 1) @70°F (21.1 °C):** 0.906

VAPOR PRESSURE @70°F (21.1 °C): N/A* **PERCENT VOLATILE BY VOLUME -** N/A*

GAS DENSITY @32°F (0 °C) and 1 atm: 0.072 lbs/ft³ (1.153 kg/ m³)

SOLUBILITY IN WATER -

Carbon Monoxide -	3.5 cm ³ /100 ml (0°C)
Methane -	9 cm ³ /100 ml (20°C)
Carbon Dioxide-	slight
Oxygen -	3.2 cm ³ /100 ml (25°C)
Hydrogen Sulfide -	437 cm ³ /100 ml (0°C)
Nitrogen -	2.3 cm ³ /100 ml (0°C)

* N/A - Not Applicable

PHYSICAL HAZARD INFORMATION

PHYSICAL HAZARD - Compressed gas, 500 PSIG at 70°F

CONDITIONS OR MATERIALS TO AVOID - None

FLASH POINT - N/A

LEL - N/A

UEL - N/A

EXTINGUISHING MEDIA - This gas mixture is not flammable.

SPECIAL FIRE FIGHTING PROCEDURES - See next item.

UNUSUAL FIRE AND EXPLOSION HAZARDS - Gas under pressure, 500 PSIG at 70°F. Do not exceed 120°F.

HEALTH HAZARDS

HEALTH HAZARDS - Methane as an alkane 1000 ppm .

Carbon monoxide : TC_{LO} human is 650 ppm/45 minutes and the IDLH for carbon monoxide is 1200ppm.

Hydrogen sulfide:LC_{LO} 800 ppm/5 minutes. No effects known below 10-ppm hydrogen sulfide.

Nitrogen is an asphyxiant.

Carbon dioxide is a simple asphyxiant with physiological effects at high concentrations, LC_{LO} (human) 9pph/5minutes , IDLH for Carbon dioxide is 40,000 ppm.

Nitrogen is an asphyxiant.

SIGNS AND SYMPTOMS OF EXPOSURE –

- Methane: May cause cardiac sensitization and CNS impairment.
- Carbon Monoxide: May cause headache, rapid breathing, nausea, weakness, dizziness and confusion.
- Hydrogen sulfide: May cause irritation to the eyes and respiratory tract.
- Carbon dioxide: May cause dizziness, nausea, headache, mental confusion, increased blood pressure and respiratory rate.

PRIMARY ROUTES OF ENTRY - Inhalation, eyes.

TARGET ORGANS –

- Methane: Heart and CNS.
- Carbon monoxide: Lungs, Blood, and Tissues.
- Carbon monoxide at toxic concentrations causes tissue hypoxia (lack of oxygen) by preventing blood from transporting sufficient oxygen.
- Hydrogen sulfide eyes, mucous membranes and respiratory tract.
- Carbon dioxide: Lungs, CNS and eyes.
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MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE - Methane exposure may aggravate CNS and heart conditions. Carbon monoxide burden may aggravate angina pectoris. Pregnant women are reportedly more sensitive than others. Effects of carbon monoxide exposure are aggravated by heavy labor, heat stress and high altitude. Carbon dioxide may aggravate acute or chronic respiratory conditions. Over exposure to carbon dioxide may aggravate eye disorders and CNS conditions.

EXPOSURE LIMITS –

- Methane as an alkane 1000 ppm.
- Carbon Monoxide 25 ppm TWA, (ACGIH 2010); OSHA PEL TWA 50 ppm.
- Hydrogen sulfide; 1 ppm TWA, 5 ppm STEL (ACGIH 2010); OSHA PEL C20ppm, STEL 50 ppm.
- Carbon dioxide 5000 ppm TWA, 30,000 ppm STEL (ACGIH 2010); OSHA PEL 5000 ppm.

CARCINOGENICITY DATA - NIOSH RTECS, OSHA, NTP or IARC does not list component gases.

EMERGENCY AND FIRST AID PROCEDURES - Remove from exposure. Administer Oxygen. Consult Physician Immediately.

SAFE HANDLING AND USE

HYGIENIC PRACTICES - Avoid breathing gas.

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT - N/A

PROCEDURES FOR SPILL OR LEAK CLEANUP - Ventilate area.

WASTE DISPOSAL - Do not puncture or incinerate cylinder. Before discarding cylinder, slowly release contents to a safe exhaust. Dispose of cylinder in accordance with local, state and federal regulations

STORAGE - Store in a cool, dry, well-ventilated area. Do not exceed 120°F.

CONTROL MEASURES

PERSONAL PROTECTIVE EQUIPMENT - Due to the limited amount of gas in the cylinder, and the low release rate employed in instrument calibration, respiratory protection is not indicated under conditions of intended use.

ENGINEERING CONTROLS - Mechanical ventilation is suitable.

WORK PRACTICES - Avoid breathing gas. Use in well-ventilated areas. Follow the calibration procedure detailed in the MSA instruction manual provided with the instrument under calibration.

DATE OF PREPARATION - Rev. 3, August 2011

WARNING: This is a hazardous chemical product. By following the directions and warnings provided with this product, the hazards associated with the use of this product can be greatly reduced but never entirely eliminated. Mine Safety Appliances Company makes no warranties, expressed or implied, with respect to this product and EXPRESSLY DISCLAIMS THE WARRANTY OF MERCHANTABILITY AND ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. Users assume all risks in handling, using or storing this product.