

**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**  
**1000 Cranberry Woods Drive**  
**Cranberry Township, PA 16066**  
**PHONE (724) 776-8900**

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

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**PRODUCT IDENTITY**

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**LABEL IDENTITY -** MSA P/N 10045035 Calibration Check Gas, 60 ppm Carbon Monoxide, 1.45% Methane, 15% Oxygen, 20 ppm Hydrogen Sulfide, Balance Nitrogen

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

**ADDITIONAL IDENTITIES -** MSA P/N 10045035 Calibration Gas

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

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**APPLICABLE CHEMICAL CONTENTS**

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	<u>%</u>	<u>TWA</u>	<u>STEL</u>
Carbon Monoxide (CAS 630-08-0) (ACGIH 2013)	0.0060	25 ppm	
Methane (CAS 74-82-8)	1.45	*	
Oxygen (CAS 7782-44-7)	15	None	
Hydrogen Sulfide (CAS 7783-06-4)	0.0020	1 ppm	5 ppm
Nitrogen (CAS 7727-37-9)	Balance	None	

\*Methane is as an asphyxiant (ACGIH 2013)

**NOTE:** Gas Under Pressure, 500 PSIG at 70°F, Approx. 58 Liters Gas at Atmospheric Pressure

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**PHYSICAL AND CHEMICAL PROPERTIES**

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

**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/ft<sup>3</sup> (1.153 kg/ m<sup>3</sup>)

**VAPOR DENSITY (AIR = 1) -** Approx. 1

**SOLUBILITY IN WATER -**

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

\*N/A - Not Applicable

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**PHYSICAL HAZARD INFORMATION**

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**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.

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## HEALTH HAZARDS

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### HEALTH HAZARDS –

- Methane as an asphyxiant.
- Carbon monoxide TC<sub>LO</sub> (human) is reportedly 650 ppm/45 minutes; LC<sub>LO</sub> (human) 5000 ppm/5 minutes.
- Hydrogen sulfide LC<sub>LO</sub> (human) 800 ppm/5 minutes. No effects known below 10 ppm.

### SIGNS AND SYMPTOMS OF EXPOSURE –

- Methane: oxygen deprivation; increased ventilation, increased cardiac output, and fatigue. (headache, rapid breathing, nausea, weakness, dizziness and confusion.)
- Carbon Monoxide exposure to 500-1000 ppm CO may cause headache, rapid breathing, nausea, weakness, dizziness and confusion.
- Hydrogen sulfide exposure is an irritant of the eyes and respiratory tract.

### PRIMARY ROUTES OF ENTRY - Inhalation, eyes,

### TARGET ORGANS –

- Methane affects the brain and heart tissue.
- Carbon monoxide: Lungs, Blood, Tissues. Carbon monoxide at toxic concentrations causes tissue hypoxia (lack of oxygen) by preventing blood from transporting sufficient oxygen.
- Hydrogen sulfide is an irritant of the eyes and respiratory tract.

MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE - Carbon monoxide burden may aggravate angina pectoris. Pregnant women are reportedly more sensitive to Carbon monoxide than others. Effects of Carbon monoxide exposure are aggravated by heavy labor, heat stress and high altitude.

### EXPOSURE LIMITS –

- Methane as an asphyxiant. (ACGIH 2013).
- Carbon Monoxide 25 ppm (ACGIH 2013). OSHA TWA 35 ppm
- Hydrogen sulfide: TWA is 1 ppm, STEL 5 ppm. (ACGIH 2013).

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.

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## SAFE HANDLING AND USE

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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.

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## CONTROL MEASURES

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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, November 2013

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.