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, nitrogen dioxide, and nitrogen, substances subject to the Pennsylvania Worker and Community Right-To-Know Act.

PRODUCT IDENTITY

LABEL IDENTITY - MSA P/N 10153804 Calibration Check Gas, 60 ppm Carbon Monoxide, 10 ppm Nitrogen dioxide, Balance Nitrogen

CHEMICAL NAME - Carbon Monoxide, Nitrogen dioxide, Nitrogen Mixture

ADDITIONAL IDENTITIES - MSA P/N 10153804 calibration gas

FORMULA - $CO + NO_2 + N2$

APPLICABLE CHEMICAL CONTENTS

	%	TWA	STEL	OSHA
Carbon Monoxide (CAS 630-08-0) (NIOSH REL)	0.0060	35 ppm		PEL TWA 50 ppm
Nitrogen dioxide (CAS 10102-44-0) (NIOSH REL)	0.001	0.2 ppm		PEL C 5ppm
Nitrogen (CAS 7727-37-9)	Balance	None		

NOTE: Gas under pressure, 500 PSIG at 70°F, Approx. 58 liters of gas at atmospheric pressure.

PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR - Colorless, pungent acrid odor.
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^3 (1.153 kg/ $m^{3)}$

SOLUBILITY IN WATER - Carbon Monoxide -3.5 cm^3/100 ml (0°C)
Nitrogen Dioxide - reacts
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 - Carbon monoxide TC_{LO} human is 650 ppm/45 minutes and the IDLH for carbon monoxide is 1200ppm. Gaseous nitrogen dioxide is a severe pulmonary irritant. Overexposure produces pulmonary edema, which may occur within one or two hours and may re-occur with increased severity sometime later. The Immediately Dangerous to Life and Health (IDLH) concentration is 20 ppm.

Note: While Nitrogen Dioxide is a highly toxic and irritating gas (Human LC_{LO} 200 ppm/1 minute) the small quantity available from a calibration cylinder (116 liters of 10 ppm Nitrogen Dioxide in air or approx. 2.2 milligram Nitrogen Dioxide) is sufficient to sustain a material volume above the TLV if accidentally released to ambient air. Content of one cylinder diluted by 23.7 cubic meter of ambient air (equivalent to a room size of 10 x 12 x7) would yield 0.05 ppm Nitrogen Dioxide.

Nitrogen dioxide causes irritation of respiratory tract and eyes, cough, frothy sputum. The following effects are reportedly expected for a 60-minute exposure.

100 ppm -	pulmonary edema and death
50 ppm -	pulmonary edema, possible lesions in lungs, moderate irritation of eyes and nose
25 ppm -	respiratory irritation, chest pain

Note: Nitrogen Dioxide: Exposure to 10- 20 ppm nitrogen dioxide is mildly irritating.

Carbon Monoxide: Exposure to 500-1000 ppm Carbon monoxide may cause headache, rapid breathing, nausea, weakness, dizziness and confusion.

PRIMARY ROUTES OF ENTRY - Inhalation, skin and or eye contact.

TARGET ORGANS – Carbon monoxide: Lungs, CNS blood, and tissues.
Carbon monoxide at toxic concentrations causes tissue hypoxia (lack of oxygen) by preventing blood from transporting sufficient oxygen.
Nitrogen dioxide lungs, mucous membranes.

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 - Carbon monoxide 35 ppm (NIOSH REL 2013) OSHA PEL 50ppm.
Nitrogen dioxide TWA 0.2 ppm ; OSHA PEL C5ppm.

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. 0, January 2014

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.