

Precision Gas Products Inc.

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Three Part Mix, 1 to 1000 ppm Carbon Monoxide, 0.0001% to 0.75% Pentane, 2% to 23% Oxygen in Nitrogen Balance Gas

MATERIAL SAFETY DATA SHEET

Identification

Revision Date 01-01-15

Products Name: 1 to 1000 PPM Carbon Monoxide, 0.0001% to 0.75% Pentane, Oxygen 2% to 23% in Nitrogen

Chemical Family: Gas Mixture

Chemical formula: CO, C₅H₁₂, O₂ in N₂

Synonyms: Calibration Gas, Bump Gas, Cal Gas Mixture, Three Part Mix

MSDS identification Code/ Number: MSDS 106MX156

Composition/ Information on Ingredients

Ingredient Name	Exposure Limits	Concentration Percent by Weight
Carbon Monoxide CAS Number 0630-08-0	ACGIH TWA: 25 PPM Canada STEL: 200 PPM Canada TWA: 25 PPM OSHA TWA: 50 PPM	0.0001% to 0.1%
Pentane CAS Number 0109-66-0	ACGIH TWA: 600 PPM ACGIH STEL: 750 PPM OSHA TWA: 1000 PPM Canada TWA: 600 PPM Canada STEL: 750 PPM	0.0001% to 0.75%
Oxygen CAS Number 7782-44-7	None	2.0% to 23%
Nitrogen CAS Number 7727-37-9	None Simple asphyxiant. Maintain oxygen levels above 19.5% at sea level.	74.40% to 97.99%

First Aid Measures

Inhalation

Prompt medical attention is mandatory in all cases of overexposure. Rescue personnel should be equipped with self-contained breathing apparatus.

Quick removal from the contaminated area is most important. Conscious persons should be moved to an uncontaminated area and inhale fresh air. Unconscious persons should be moved to an uncontaminated area, given artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive. The administering of oxygen at an elevated pressure (up to 2 to 2.5 atmospheres) has shown to be beneficial as has treatment in hyperbaric chamber. The physician should be informed that the patient has inhaled toxic quantities of carbon monoxide.

Fire Fighting Measures

Flammable Properties

Flash Point: N/A Gas

	<u>Carbon Monoxide</u>	<u>Pentane</u>
Lower Explosive Limit (%)	12.5	1.5
Upper Explosive Limit (%)	74.0	7.8

Fire Fighting Measures – Continued

- Fire and Explosion Hazards: None
- Extinguishing Media: Use any extinguishing media suitable for the surrounding fire. Use water spray to cool fire-exposed container.
- Fire Fighting Instructions: If possible, stop the flow of gas that is supporting the fire.
- Electrical Classification: Nonhazardous

Accidental Release Measures

Evacuate all personnel from affected areas. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact CHEMTREC location for emergency assistance.

Handling and Storage

- Handling and Storage Precautions

Protect cylinders from physical damage. Store in cool, dry, well – ventilated area of noncombustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 130°F (54°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Use a “first in, first out” inventory system to prevent full cylinders being stored for excessive periods of time. Post “NO SMOKING OR OPEN FLAMES” signs in the storage area or use area. There should be no sources of ignition in the storage or use area.

Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure-reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous backflow into the system.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, asphyxiation or toxic exposure.

Exposure Controls/Personal Protection

Engineering Control: Use local exhaust to reduce concentrations to within current exposure limits. A laboratory type hood is suitable for handling small or limited quantities.

Eye / Face Protection: Safety goggles or glasses.

Skin Protection: Protective gloves: neoprene, butyl rubber, PVC, polyethylene

Respiratory Protection: A type C respirator with full face piece equipped with an escape bottle or self-contained breathing apparatus should be available for emergency use.

Other/General Protection: Safety shoes, safety shower, eyewash fountain.

Physical & Chemical Properties

Appearance: A colorless, nonflammable gas.

Boiling Point: -317°F -194.3°C

Odor: Odorless gas

Vapor Pressure: Above critical temperature.

Vapor Density (Air=1): Not determined

Solubility (H₂O): Slightly.

Stability & Reactivity

Stability: Stable

Incompatible Materials: None Known

Hazardous Polymerization: Will not occur.

Toxicological Information

- Acute Inhalation Effects

Depending on levels and duration of exposure, symptoms may include headache, dizziness, heart palpitations, weakness, confusion and nausea to convulsions, eventual unconsciousness and death.

The oxygen transport function of the hemoglobin of the blood is reduced since it reacts with inhaled carbon monoxide to form carboxyhemoglobin instead of its normal reaction with the oxygen in the lungs to form oxyhemoglobin. The affinity of hemoglobin for carbon monoxide is 200 to 300 times greater than its affinity for oxygen.

- Miscellaneous Toxicological Information

Carcinogenicity – NTP: No IARC: No OSHA: No

Ecological Information

Other Environmental Information: This product contains no materials which are listed on the U.S EPA List of Toxic Chemicals (40CFR 372), and is therefore subject to release reporting under Section 313 of EPCRA/SARA Title III.

Disposal Considerations

Do not attempt to dispose of waste or unused quantities. Return in the shipping container, *properly labeled, with any valve outlet plugs or caps secure and valve protection cap in place* to Precision Gas Products for proper disposal. Non-refillable containers should be vented in a well ventilated area then disposed of in compliance with local regulations.

Transport Information

Proper Shipping Name: Compressed Gas, N.O.S (Nitrogen, Carbon Monoxide)

Hazardous Class: 2.2

CT (DOT) Identification Number: UN 1956

CT (DOT) Shipping Label: Nonflammable gas

Regulatory Information

SARA Title III – Hazard Class: Acute Health Hazard

Sudden Release of Pressure Hazard

Chronic Health Hazard

Other Information

Hazard Ratings:

Health:	3
Fire:	0
Reactivity:	0
Special:	None

MSDS Identification Code / Number: MSDS 106MX156

Reference Documentation

Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipments of a compressed gas cylinder, which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR).

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