PRODUCT INFORMATION

PRODUCT: Pentane, Carbon Monoxide, Oxygen in Nitrogen

TRADE NAME: None

CHEMICAL NAME: Gas mixture of Nitrogen, Oxygen, Pentane, and Carbon Monoxide

SYNONYMS: None

FORMULA: 0.5% C₅H₁₂, 35 ppm CO, 18% O₂, N₂ Balance

CHEMICAL FAMILY: Gas Mixture

SUPPLIER’S NAME: MEGS Inc.

SUPPLIER’S ADDRESS: 2675 De Miniac
Ville St-Laurent, Qc, H4S 1E5

EMERGENCY PHONE NUMBER: (514) 956-7503

MOLECULAR WEIGHT: 28.95

PRODUCT USE: Various

PRODUCT IDENTIFICATION NUMBER: UN 1956 Compressed gases, n.o.s.

HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>CHEMICAL ID</th>
<th>CONCENTRATION</th>
<th>CAS #</th>
<th>LD(50)</th>
<th>LC(50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentane</td>
<td>0.5%</td>
<td>109-66-0</td>
<td>(Mouse) 446 mg/kg</td>
<td>Inhl(Rat) &gt;6100 ppm/4 h</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>35 ppm</td>
<td>630-08-0</td>
<td>None</td>
<td>Inhl(Man): 4000 ppm/30min</td>
</tr>
<tr>
<td>Oxygen</td>
<td>18%</td>
<td>7782-44-7</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>Balance</td>
<td>7727-37-9</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
PHYSICAL DATA

PHYSICAL STATE: Gas under pressure
APPEARANCE: Colorless
ODOR: Mild "gasoline" smell
ODOR THRESHOLD: 60 to 250 ppm Pentane in Air
SPECIFIC GRAVITY (H₂O = 1): See Vapor Density (air=1)
VAPOR PRESSURE: Not applicable (gas)
VAPOR DENSITY (air = 1): 1.00 @ 15°C, 101.3 kPa
EVAPORATION RATE: Not applicable (gas)
BOILING POINT: N₂ = -196°C; O₂ = -183°C; C₅H₁₂ = 36°C; CO = -192°C
FREEZING POINT: N₂ = -210°C; O₂ = -219°C; C₅H₁₂ = -130°C; CO = -207°C
pH: Not applicable (gas)
GAS DENSITY: 1.23 kg/m³ @ 15°C, 101.3 kPa
COEFFICIENT OF WATER/OIL DISTRIBUTION:
Bunsen Coefficient @ 15°C: N₂ = 0.017; O₂ = 0.034; C₅H₁₂ = negligible solubility in water; CO = 0.025

<table>
<thead>
<tr>
<th>Typical Composition</th>
<th>As Generated</th>
<th>Settled</th>
<th>Pond Dried</th>
<th>Filtered</th>
</tr>
</thead>
</table>

FIRE OR EXPLOSION HAZARD

CONDITIONS OF FLAMMABILITY: Nonflammable gas
MEANS OF EXTINCTION: Nonflammable gas
FLASHPOINT AND METHOD OF DETERMINATION: Nonflammable gas
UPPER EXPLOSION LIMIT (% BY VOL): Nonflammable gas
LOWER EXPLOSION LIMIT (% BY VOL): Nonflammable gas
AUTO-IGNITION TEMPERATURE: Nonflammable gas
FLAMMABILITY CLASSIFICATION: Nonflammable gas
HAZARDOUS COMBUSTION PRODUCTS: Nonflammable gas
EXPLOSION DATA: Nonflammable gas
SENSITIVITY TO STATIC DISCHARGE: None
REACTIVITY DATA

CHEMICAL STABILITY: Chemically stable

INCOMPATIBLE MATERIALS: Minor components are susceptible to strong oxidizers such as peroxides, chromates, bichromates, permanganates, oxy- and azohalides.

CONDITIONS OF REACTIVITY: Not applicable

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition products of pentane include oxides of carbon.

TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:

SKIN CONTACT: Continuous and prolonged exposure may lead to mild deflating and reddening of the skin from the pentane component.

SKIN ABSORPTION: Unknown.

EYE: Due to the pentane content, continuous exposure may cause mild irritation to the conjunctivae of the eyes.

INHALATION: Nitrogen is a simple asphyxiant. The pentane content is not expected to cause problems (exposures to 5000 ppm for 10 minutes were found not to be irritating to the mucous membranes or to produce local or systemic effects in humans). The carbon monoxide, although higher than the 8 h TLV-TWA level is unlikely to cause any symptoms of poisoning such as headache (usually 100-200 ppm required for several hours). The mixture contains enough oxygen to support life but could cause headaches or dizziness if breathed without dilution in environmental air.

INGESTION: Unknown

ACUTE OVER EXPOSURE EFFECTS: May act as an irritant to mucous tissue, membranes and the conjunctivae of the eyes.

CHRONIC OVER EXPOSURE EFFECTS: Unknown

EXPOSURE LIMITS: TWA(CO) = 25 ppm; TWA(n-Pentane) = 600 ppm STEL = 750 (ACGIH 1996)

IRRITANCY OF PRODUCT: See Skin and Eye Contact, above
SENSITIZATION TO MATERIAL: None known

CARCINOGENICITY, REPRODUCTIVE EFFECTS: None known

TERATOGENICITY, MUTAGENICITY: None known

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None known, Note: Nitrogen has no irritating or toxic effect.

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: Safety goggles or glasses, face shield, rubber gloves. Safety shoes, safety shower and eyewash "fountain".

SPECIFIC ENGINEERING CONTROLS: This mixture can be handled in carbon steel, aluminum, Inconel, Stellite and 304 and 316 stainless steels. Systems must be designed to adequately handle the pressures involved.

LEAK AND SPILL PROCEDURES: EVACUATE ALL PERSONNEL FROM AFFECTED AREA.
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 on container or container valve, contact the closest MEGS location.

WASTE DISPOSAL: Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to MEGS for proper disposal. For emergency disposal, contact the closest MEGS location.

HANDLING PROCEDURES AND EQUIPMENT: USE ONLY IN WELL-VENTILATED AREAS.
Valve protection caps must remain in place unless container is secured with valve outlet piped to the point of use. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting to lower pressure 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 back flow into the cylinder. Do not tamper with (valve) safety device. Close valve after each use and when empty.

STORAGE REQUIREMENTS: Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 52°C. Cylinders must be stored upright and firmly
secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time.

**TDG CLASSIFICATION:** 2.2

**WHMIS CLASSIFICATION:** A

**SPECIAL SHIPPING INFORMATION:** Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

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**FIRST AID MEASURES**

**SPECIFIC FIRST AID PROCEDURES:** PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO THIS MIXTURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

**INHALATION:** Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

**EYE CONTACT:** Flush eyes with running water for 10 minutes. If irritation develops, use epinephrine sulphate (1:1000) eye drops and seek medical attention.

**SKIN CONTACT:** Wash affected areas with soap and water. If irritation develops, seek medical attention.

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**PREPARATION INFORMATION**

**PREPARED BY:** Safety Department

**DATE PREPARED:** 10/09/1999

**LAST REVISION DATE:** 02/01/2002

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