1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS:
CARBON MONOXIDE/CARBON DIOXIDE/HELIUM/NITROGEN GAS MIXTURE

CHEMICAL FAMILY: Carbon Monoxide, Carbon Dioxide Inert Gas Mixture  PRODUCT USE: Laser Carrier Gas

TRADE NAME: Laser Carrier Gas

MANUFACTURER
MATHESON TRI-GAS, INC.
959 ROUTE 46 EAST
PARSIPPANY, NJ  07054-0624
USA
Phone: 973/257-1100

EMERGENCY PHONE: CHEMTREC DOMESTIC U.S.: 1-800-424-9300
CHEMTREC INTERNATIONAL: 1-703-527-3887
CANUTEC (CANADA): 1-613-996-6666

2. COMPOSITION and INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS #</th>
<th>mole %</th>
<th>EXPOSURE LIMITS IN AIR</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACGIH-TLV TWA ppm</td>
<td>OSHA-STELE TWA ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TWA ppm</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>630-08-0</td>
<td>4%</td>
<td>25</td>
<td>NE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>124-38-9</td>
<td>8%</td>
<td>5000</td>
<td>30,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

See Section 16 for Definitions of Terms Used.
(Table Continued on Following Page)
### 2. COMPOSITION and INFORMATION ON INGREDIENTS (Continued)

(10,000 ppm = 1%)

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS #</th>
<th>mole %</th>
<th>EXPOSURE LIMITS IN AIR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACGIH-TLV</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA ppm</td>
</tr>
<tr>
<td>Helium</td>
<td>7440-59-7</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td>7727-37-9</td>
<td>Balance</td>
<td></td>
</tr>
</tbody>
</table>

There are no specific exposure limits for Helium. Helium is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.

Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.

**NOTE:** All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

See Section 16 for Definitions of Terms Used.

### 3. HAZARD IDENTIFICATION

**EMERGENCY OVERVIEW:** This gas mixture is a colorless, non-flammable gas which is odorless or which has a sharp odor (due to the presence of Carbon Dioxide). This gas mixture can cause nausea, dizziness, headaches, and collapse, due to Carbon Monoxide. An additional significant hazard associated with this gas mixture is the potential for Carbon Dioxide overexposures. Inhalation of this gas mixture can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. Severe inhalation exposures may be fatal, due to Carbon Dioxide and Carbon Monoxide overexposure or asphyxiation. Moisture in the air could lead to the formation of carbonic acid which can be irritating to the eyes. A cylinder rupture hazard exists when this gas mixture, which is under pressure, is subject to heat or flames.

**SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE:** The most significant route of over-exposure for this product is by inhalation.

**INHALATION:** Inhalation exposures may produce adverse health, due to the presence of Carbon Monoxide and Carbon Dioxide. Carbon Monoxide is classified as a chemical asphyxiant, producing a toxic action by combining with the hemoglobin of the blood and replacing the available oxygen. Since the affinity of Carbon Monoxide for hemoglobin is about 200-300 times that of oxygen, only a small amount of Carbon Monoxide will cause an adverse reaction to occur. Carbon Monoxide exposures in excess of 50 ppm will produce symptoms of poisoning if breathed for a sufficiently long time. If this gas mixture is inhaled, symptoms which may develop from Carbon Monoxide include those described on the following page.

**CARBON MONOXIDE CONCENTRATION**

**OBSERVED EFFECT**

All exposure levels: Overexposure to Carbon Monoxide can be indicated by the lips and fingernails turning bright red.

- **200 ppm:** Slight symptoms (headache, discomfort) after several hours of exposure.
- **400 ppm:** Headache and discomfort experienced within 2-3 hours of exposure.
- **1000 to 2000 ppm:** Within 30 minutes, slight palpitations of the heart occur. Within 1.5 hours, there is a tendency to stagger. Within 2 hours, there is mental confusion, headache, and nausea.
- **2000-2500 ppm:** Unconsciousness within 30 minutes.
- **> 2500 ppm:** Potential for collapse and death before warning symptoms are produced.

(continued on following page)
3. HAZARD IDENTIFICATION (Continued)

INHALATION (continued):

One of the other significant health hazards associated with this gas mixture is the potential for overexposure to Carbon Dioxide. Carbon Dioxide is an asphyxiant and a powerful cerebral vasodilator. If the concentration of Carbon Dioxide reaches 10% or more, suffocation can occur rapidly. Inhalation of concentrations between 2 and 10% can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. Carbon Dioxide initially stimulates respiration and then causes respiratory depression. Inhalation of low concentrations (3-5%) have no known permanent harmful effects. Symptoms in humans at various levels of concentration are as follows:

<table>
<thead>
<tr>
<th>CARBON DIOXIDE CONCENTRATION</th>
<th>SYMPTOMS OF EXPOSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>Slight increase in breathing rate.</td>
</tr>
<tr>
<td>2%</td>
<td>Breathing rate increases to 50% above normal; headache; tiredness.</td>
</tr>
<tr>
<td>3%</td>
<td>Breathing increases to twice normal rate, becoming labored; weak narcotic effect; impaired hearing; headache; increase in blood pressure and pulse rate.</td>
</tr>
<tr>
<td>4-5%</td>
<td>Breathing increases to four times normal rate; symptoms of intoxication become evident and slight choking may be felt.</td>
</tr>
<tr>
<td>5-10%</td>
<td>Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment and ringing in the ears. Judgment may be impaired, followed by loss of consciousness.</td>
</tr>
<tr>
<td>&gt;10%</td>
<td>Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.</td>
</tr>
</tbody>
</table>

Releases of this gas mixture may also cause an oxygen-deficient environment, if levels of Helium and Nitrogen are high. The effects associated with various levels of oxygen include disturbed muscular coordination, abnormal fatigue, disturbed respiration, nausea, vomiting, collapse, or loss of consciousness. Death may occur due to asphyxiation. It is important to note that the asphyxiating properties of Carbon Dioxide will be reached before oxygen-deficiency is a significant factor.

CONTACT WITH SKIN or EYES: Moisture in the air could lead to the formation of carbonic acid, which can be irritating to the eyes. Contact with the eyes can cause damage to the retinal ganglion cells.

SKIN ABSORPTION: No component of this gas mixture presents a hazard of skin absorption.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: Over-exposure to this gas mixture may cause the following health effects:

ACUTE: This gas mixture can produce adverse health effects due to Carbon Monoxide and Carbon Dioxide overexposure or oxygen deficiency. Symptoms of overexposure, at the Carbon Monoxide concentrations present in this gas mixture, may include lips and fingernails turning bright red, headaches, shortness of breath, wheezing, blurred vision, memory loss, dizziness, indigestion, and nausea. Inhalation of this gas mixture also cause visual disturbances, shaking, mental confusion, sweating, increased heartbeat, and elevated blood pressure and respiratory rate (due to the presence of Carbon Dioxide). Severe inhalation overexposures areas can be fatal. This gas mixture can be irritating to the eyes.

CHRONIC: Carbon Monoxide is a reproductive toxin. Reversible effects on the acid-base balance in the blood, blood pressure, and circulatory system may occur after prolonged exposure to elevated Carbon Dioxide levels. Refer to Section 11 (Toxicological Information) of this MSDS for further information.

TARGET ORGANS: ACUTE: Respiratory system, cardiovascular system, eyes. CHRONIC: Cardiovascular system, reproductive system.

HMIS RATING: HEALTH HAZARD = 2 FLAMMABILITY HAZARD = 0 PHYSICAL HAZARD = 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe PPE LEVEL B = Goggles, gloves (leather for handling cylinders)
4. FIRST-AID MEASURES

GENERAL INFORMATION: Remove to fresh air, as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Seek medical attention immediately.

SKIN EXPOSURE: If release of this gas mixture has resulted in frostbite, warm affected area slowly. Seek immediate medical attention.

EYE EXPOSURE: If release of this gas mixture has affected the eyes, seek immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions, cardiovascular conditions and disorders involving the “Target Organs” (see Section 3, Hazard Identification) may be aggravated by overexposure to this product.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable

FLAMMABLE LIMITS (in air by volume, %):

- Lower (LEL): Not applicable.
- Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Use extinguishing materials appropriate for surrounding materials involved in the fire. Water spray should be used to cool fire-exposed containers.

UNUSUAL FIRE AND EXPLOSION HAZARD: This gas mixture does not burn; however, cylinders, when involved in a fire, may rupture or burst in the heat of the fire.

EXPLOSION SENSITIVITY TO MECHANICAL IMPACT: Not sensitive.

EXPLOSION SENSITIVITY TO STATIC DISCHARGE: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Immediately cool the cylinders with water spray from a maximum distance. When cool, move cylinders from fire area if this can be done without risk to firefighters.

6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used in the event of a significant release from a single cylinder. Call CHEMTREC (1-800-424-9300) for emergency assistance. Or if in Canada, call CANUTEC (613-996-6666).

Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there. Monitor the surrounding area for the level of Oxygen. The atmosphere must have at least 19.5 percent Oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES:

Do not eat or drink while handling chemicals.

Be aware of all potential exposure symptoms; exposures to a fatal oxygen-deficient atmosphere could occur without any significant warning symptoms.
7. HANDLING and USE (Continued)

WORK PRACTICES AND HYGIENE PRACTICES (continued):

All work operations should be monitored in such a way that emergency personnel can be immediately contacted in the event of a release.

Workers who handle this gas mixture should wear protective clothing, as listed in Section 8 (Exposure Controls and Personal Protection).

If ventilation controls are not adequate to provide sufficient oxygen content, proper respiratory protection equipment should be provided and workers using such equipment should be carefully trained in its operation and limitations.

Precautions must always be taken to prevent suck-back of foreign materials into the cylinder by using a check-valve, or vacuum break, since suck-back may cause dangerous pressure changes within the cylinder.

STORAGE AND HANDLING PRACTICES: cylinders should be stored upright and be firmly secured to prevent falling or being knocked-over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Cylinders should be stored in dry, well-ventilated areas away from sources of heat or ignition. Do not allow the area where cylinders are stored to exceed 52°C (125°F).

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Compressed gases can present significant safety hazards. The following rules are applicable to work situations in which cylinders are being used.

Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap (where provided) in-place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not use oils or grease on gas-handling fittings or equipment. Immediately contact the supplier if there are any difficulties associated with operating the cylinder valve. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Do not strike an arc, on a compressed gas cylinder or make a cylinder part of an electric circuit.

After Use: Close main cylinder valve. Replace valve protection cap. Close valve after each use and when empty. Mark empty cylinders “EMPTY”.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure compliance with exposure limits described in Section 2 (Composition and Information on Ingredients). Local exhaust ventilation is preferred, because it prevents dispersion of this gas mixture into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the level of Oxygen.

RESPIRATORY PROTECTION: Maintain the Oxygen level above 19.5% in the workplace. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent U.S. State standards and Canadian CSA Standard Z94.4-93. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA’s Respiratory Protection Standard (1910.134-1998). The following NIOSH respiratory protection recommendations for Carbon Dioxide and Carbon Monoxide concentrations in air are provided for additional guidance in respirator selection:

CARBON DIOXIDE CONCENTRATION RESPIRATORY EQUIPMENT
Up to 40,000 ppm: Supplied Air Respirator (SAR); or full-facepiece Self-Contained Breathing Apparatus (SCBA).

(continued on following page)
8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

RESPIRATORY PROTECTION (continued):
CARBON DIOXIDE
CONCENTRATION RESPIRATORY EQUIPMENT
Emergency or Planned Entry Into Unknown Concentrations or IDLH Conditions:  Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.
Escape:  Escape-type SCBA.

CARBON MONOXIDE
CONCENTRATION RESPIRATORY EQUIPMENT
Up to 350 ppm:  Supplied Air Respirator (SAR).
Up to 875 ppm:  SAR operated in a continuous flow mode.
Up to 1200 ppm:  Gas mask with canister to protect against carbon monoxide; or full-facepiece Self-Contained Breathing Apparatus (SCBA); or full-facepiece SAR.
Emergency or Planned Entry Into Unknown Concentrations or IDLH Conditions:  Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.
Escape:  Gas mask with canister to protect against carbon monoxide; or escape-type SCBA.

NOTE:  End of Service Life Indicator (ESLI) required for gas masks.

EYE PROTECTION:  Splash goggles or safety glasses.  If necessary, refer to U.S. OSHA 29 CFR 1910.133, or appropriate Canadian Standards.


BODY PROTECTION:  Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to the task. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee’s feet may be exposed to electrical hazards, foot protection should be used, as described in U.S. OSHA 29 CFR 1910.136.

9. PHYSICAL and CHEMICAL PROPERTIES

The following tables provide physical property information on the components of this gas mixture:

<table>
<thead>
<tr>
<th></th>
<th>HELIUM</th>
<th>NITROGEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas Density</td>
<td>0.103 lb/cu ft (1.165 kg/m³)</td>
<td>0.072 lb/cu ft (1.153 kg/m³)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>0.138</td>
<td>0.967</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>0.0094</td>
<td>0.023</td>
</tr>
<tr>
<td>Expansion Ratio</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>Not applicable.</td>
<td>-209.9°C (-345.8°F)</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>-268.9°C (-452.1°F)</td>
<td>-195.8°C (-320.4°F)</td>
</tr>
<tr>
<td>Specific Volume</td>
<td>97.09 ft³/lb</td>
<td>13.89 ft³/lb</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>4.00</td>
<td>28.01</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Coefficient Water/Oil Distribution</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

(see second table for remaining components)
9. PHYSICAL and CHEMICAL PROPERTIES (Continued)

The following information is for the Carbon Dioxide and Carbon Monoxide components of this gas mixture:

<table>
<thead>
<tr>
<th></th>
<th>CARBON DIOXIDE</th>
<th>CARBON MONOXIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gas Density</strong></td>
<td>0.1144 lb/ft³ (1.833 kg/m³)</td>
<td>0.0725 lb/ft³ (1.161 kg/m³)</td>
</tr>
<tr>
<td><strong>Specific Gravity (air = 1)</strong></td>
<td>0.90</td>
<td>0.9676</td>
</tr>
<tr>
<td><strong>Solubility in Water</strong></td>
<td>0.0491</td>
<td>0.035</td>
</tr>
<tr>
<td><strong>Expansion Ratio</strong></td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Evaporation Rate</strong></td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Freezing Point</strong></td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Boiling Point</strong></td>
<td>Sublimes.</td>
<td>-191.5°C (-312.7°F)</td>
</tr>
<tr>
<td><strong>Specific Volume</strong></td>
<td>8.741 ft³/lb</td>
<td>13.8 ft³/lb</td>
</tr>
<tr>
<td><strong>Molecular Weight</strong></td>
<td>44.01</td>
<td>28.01</td>
</tr>
<tr>
<td><strong>Odor Threshold</strong></td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Vapor Pressure</strong></td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Coefficient Water/Oil Distribution</strong></td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

The following information is pertinent to this product:

**APPEARANCE, ODOR AND COLOR:** This gas mixture is colorless and odorless, or may have a sharp odor (depending on the level of Carbon Dioxide).

**HOW TO DETECT THIS SUBSTANCE (warning properties):** There are no distinct warning properties of this gas mixture, unless the Carbon Dioxide is at a high concentration, when the odor may be a warning property. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

10. STABILITY and REACTIVITY

**STABILITY:** Stable at standard temperatures and pressures.

**DECOMPOSITION PRODUCTS:** The Carbon Dioxide component will produce Carbon Monoxide and Oxygen when heated to temperatures above 3000°F (1648°C). The Hydrogen component of this product will thermally decompose to form carbon oxides. The Nitrogen and Helium components of this product do not decompose, per se, but may react with other compounds in the heat of a fire.

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** Due to the presence of Carbon Dioxide, this gas mixture may be incompatible with a variety of metals, alloys, and metal acetylides (e.g., aluminum, chromium, and zirconium). Carbon Dioxide will react with alkaline materials to form carbonates and bicarbonates. The Nitrogen and Helium components of this gas mixture are relatively inert gases.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.
11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Helium, and Nitrogen are simple asphyxiants (SA), which act to displace oxygen in the environment. The following data are available for the Carbon Dioxide and Carbon Monoxide components of this gas mixture.

**CARBON DIOXIDE:**
- LCLo (inhalation, human) = 9 pph/5 minutes.
- LCLo (inhalation, mammal) = 90000 ppm/5 minutes.
- TCLo (inhalation, rat) = 6 pph/24 hours; reproductive and teratogenic effects.

**CARBON MONOXIDE:**
- LClO (Inhalation-Rat) 1807 ppm/ 4 hours
- LClO (Inhalation-Mouse) 2444 ppm/ 4 hours

**CARBON MONOXIDE (continued):**
- TCLo (Inhalation-Human) 600 mg/m$^3$/ 10 minutes
- TCLo (Inhalation-Man) 650 ppm/45 minutes: Central nervous system, Blood effects
- TCLo (Inhalation-Mouse) 65 ppm/ 24 hours (female 7–18 days post): Reproductive effects
- TCLo (Inhalation-Mouse): 8 pph/ 1 hours (female 8 days post): Teratogenic effects
- LClO (Inhalation-Man) 4000 ppm/ 30 minutes
- LClO (Inhalation-Human) 5000 ppm/ 5 minutes

**SUSPECTED CANCER AGENT:** The components of this gas mixture are not found on the following lists: IARC, NTP, CAL/OSHA, and therefore is not considered to be, nor suspected to be a cancer-causing agent by these agencies.

**IRRITANCY OF PRODUCT:** Due to the formation of carbonic acid, this gas mixture can be slightly irritating to contaminated eyes.

**SENSITIZATION TO THE PRODUCT:** The components of this product are not known to be skin or respiratory sensitizers.

**REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of the components of this gas mixture on the human reproductive system.

**Mutagenicity:** This gas mixture is not expected to cause mutagenic effects in humans. Animal mutagenic data are available for the Carbon Dioxide and Carbon Monoxide component of this gas mixture; these data were obtained during clinical studies on specific animal tissues exposed to relatively high doses of this gas.

**Embryotoxicity:** This gas mixture has not been reported to cause embryotoxic effects in humans.

**Teratogenicity:** This gas mixture has not been reported to cause teratogenic effects in humans. Clinical studies involving test animals exposed to high concentrations of Carbon Dioxide indicate teratogenic effects (e.g., cardiac and skeletal malformations, stillbirths). Animal mutagenic data are also available for the Carbon Monoxide component of this gas mixture; these data were obtained during clinical studies on specific animal tissues exposed to relatively high doses of this gas.

**Reproductive Toxicity:** This gas mixture is not expected to cause adverse reproductive effects in humans. Studies involving test animals exposed to high concentrations of Carbon Dioxide show effects (e.g., changes in testes).

**BIOLOGICAL EXPOSURE INDICES (BEIs):** There are Biological Exposure Indices (BEIs) determined for the Carbon Monoxide component of this gas mixture, as follows.

<table>
<thead>
<tr>
<th>CHEMICAL DETERMINANT</th>
<th>SAMPLING TIME</th>
<th>BEI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARBON MONOXIDE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Carboxyhemoglobin in blood</td>
<td>End of shift</td>
<td>3.5% of hemoglobin</td>
</tr>
<tr>
<td>• Carbon monoxide in end-exhaled air</td>
<td>End of shift</td>
<td>20 ppm</td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION

**ENVIRONMENTAL STABILITY:** This gas mixture will be dissipated rapidly in well-ventilated areas.

**EFFECT OF MATERIAL ON PLANTS or ANIMALS:** Any adverse effect on animals would be related to oxygen deficient environments.

**EFFECT OF CHEMICAL ON AQUATIC LIFE:** No an adverse effect from this gas mixture on aquatic life is expected.
13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return cylinders with any residual product to Matheson Tri-Gas. Do not dispose of locally.

14. TRANSPORTATION INFORMATION

THIS GAS MIXTURE IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (Nitrogen, Helium, Carbon Dioxide, Carbon Monoxide)

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not applicable.

D.O.T HAZARD LABEL: Non-Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as a Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles present serious safety hazards and should be discouraged.

NOTE: Shipment of compressed gas cylinders which have not been filled with the owner’s consent is a violation of Federal law [49 CFR, Part 173.301 (b)].

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas mixture is considered as dangerous goods, per regulations of Transport Canada.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (Nitrogen, Helium, Carbon Dioxide, Carbon Monoxide)

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not Applicable

HAZARD LABEL: Class 2.2 (Non-Flammable Gas)

SPECIAL PROVISIONS: None.

EXPLOSIVE LIMIT AND LIMITED QUANTITY INDEX: None.

ERAP INDEX: 3000

PASSENGER CARRYING SHIP INDEX: Forbidden

PASSENGER CARRYING ROAD VEHICLE OR PASSENGER CARRYING RAILWAY VEHICLE INDEX: Forbidden

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126

NOTE: Shipment of compressed gas cylinders via Public Passenger Road Vehicle is a violation of Canadian law (Transport Canada Transportation of Dangerous Goods Act, 1992).

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: No component of this product is subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.

U.S. SARA HAZARD CATEGORIES (SECTION 311/312, 40 CFR 370-21): ACUTE: Yes; CHRONIC: Yes; FIRE: No; REACTIVE: No; SUDDEN RELEASE: Yes
15. REGULATORY INFORMATION (Continued)

ADDITIONAL U.S. REGULATIONS (continued):

U.S. TSCA INVENTORY STATUS: Components of this product are listed on the TSCA Inventory.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

OTHER U.S. FEDERAL REGULATIONS: Hydrogen is subject to requirements under the Clean Air Act.

Under this regulation, Hydrogen has a reporting requirement of 10,000 lb (4540 kg).

U.S. STATE REGULATORY INFORMATION: Components of this product are covered under some specific State regulations, as denoted below (other State regulatory lists may exist; individual States should be contacted regarding full compliance).

California - Permissible Exposure Limits for Chemical Contaminants: Carbon Monoxide, Helium, Nitrogen, Carbon Dioxide.

New Jersey - Right to Know Hazardous Substance List: Carbon Monoxide, Helium, Nitrogen, Carbon Dioxide.


CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): The Carbon Monoxide is on the California Proposition List as a compound that causes reproductive toxicity. WARNING! This product contains a compounds known to the State of California to cause reproductive harm.

LABELING: Cylinders of this gas mixture should be labeled for precautionary information per the guidelines of the CGA. Refer to the CGA for further information.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are listed on the DSL Inventory.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The components of this product are not on the CEPA Priorities Substances Lists.

CANADIAN WHMIS SYMBOLS: This gas mixture would be categorized as a Controlled Product, Hazard Classes: A (compressed gas). The following symbol is required for WHMIS compliance for this gas mixture.

16. OTHER INFORMATION

CREATION DATE: September 30

REVISION DATE: New

REVISION HISTORY: Up-date of manufacturer address and phone.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you use the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

“Safe Handling of Compressed Gases in Containers” (P-1, 1999)

“Safe Handling and Storage of Compressed Gases” (AV-1, 1999)

“Handbook of Compressed Gases” (1992)

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
PO Box 3519, La Mesa, CA 91944-3519
800/441-3365

CARBON MONOXIDE, CARBON DIOXIDE, HELIUM, NITROGEN GAS MIXTURE MSDS

EFFECTIVE DATE: SEPTEMBER 30, 2002
CAS #: This is the Chemical Abstract Service Number that uniquely identifies each constituent.

EXPOSURE LIMITS IN AIR:

CEILING LEVEL: The concentration that shall not be exceeded during any part of the working exposure.

LOQ: Limit of Quantitation.

MAK: Federal Republic of Germany Maximum Concentration Values in the workplace.

NE: Not Established. When no exposure guidelines are established, an entry of NE is made for reference.

NIC: Notice of Intended Change.

NIOSH CEILING: The exposure that shall not be exceeded during any part of the workday. If instantaneous monitoring is not feasible, the ceiling shall be assumed as a 15-minute TWA exposure (unless otherwise specified) that shall not be exceeded at any time during a workday.

NIOSH RELs: NIOSH’s Recommended Exposure Limits.

PEL-Permissible Exposure Limit: OSHA’s Permissible Exposure Limits. This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, “Vacated 1989 PEL,” is placed next to the PEL that was vacated by Court Order.

SKIN: Used when there is a danger of cutaneous absorption.

STEL-Short Term Exposure Limit: Short Term Exposure Limit, usually a 15-minute time-weighted average (TWA) exposure that should not be exceeded at any time during a workday, even if the 8-hr TWA is within the TLV-TWA, PEL-TWA or REL-TWA.

TLV-TWA: Threshold Limit Value. An airborne concentration of a substance that represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour.

TWA-Time Weighted Average: Time Weighted Average exposure concentration for a conventional 8-hr (TLV, PEL) or up to a 10-hr (REL) workday and a 40-hr workweek.

IDLH-Immediately Dangerous to Life and Health: This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM:

HAZARD RATINGS:

This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards.

HEALTH HAZARD:

0 (Minimal Hazard): No significant health risk, irritation of skin or eyes not anticipated. Skin Irritation: Essentially non-irritating. Pilot or Draize score = “0”. Eye Irritation: Essentially non-irritating, or minimal effects which clear in < 24 hours [e.g. mechanical irritation]. Draize = “0”. Oral Toxicity LD$_{50}$ Rat: < 5000 mg/kg. Dermal Toxicity LD$_{50}$ Rat or Rabbit: < 2000 mg/kg. Inhalation Toxicity 4-hrs Rat: < 20 mg/L.; 1 (Slight Hazard: Minor reversible injury may occur; slightly or mildly irritating. Skin Irritation: Slightly or mildly irritating. Eye Irritation: Slightly or mildly irritating. Oral Toxicity LD$_{50}$ Rat: > 500-5000 mg/kg. Dermal Toxicity LD$_{50}$ Rat or Rabbit: > 1000-2000 mg/kg. Inhalation Toxicity LC$_{50}$ 4-hrs Rat: > 2-20 mg/L); 2 (Moderate Hazard: Temporary or transitory injury may occur. Skin Irritation: Moderately irritating; primary irritant; sensitizer. Pilot or Draize score > 0, < 5. Eye Irritation: Moderately to severely irritating and/or corrosive; reversible corneal opacity; corneal involvement or irritation clearing in 8-21 days. Draize > 0, < 25. Oral Toxicity LD$_{50}$ Rat: > 50-500 mg/kg. Dermal Toxicity LD$_{50}$ Rat or Rabbit: > 200-1000 mg/kg. Inhalation Toxicity LC$_{50}$ 4-hrs Rat: > 0.5-2 mg/L); 3 (Serious Hazard: Major injury likely unless prompt action is taken and medical treatment is given; high level of toxicity; corrosive. Skin Irritation: Severely irritating and/or corrosive; may destroy dermal tissue, cause skin burns, dermal necrosis. Pilot or Draize > 5-8 with destruction of tissue. Eye Irritation: Corrosive, irreversible destruction of ocular tissue; corneal involvement or irritation persisting for more than 21 days. Draize > 80 with effects irreversible in 21 days. Oral Toxicity LD$_{50}$ Rat: > 1-50 mg/kg. Dermal Toxicity LD$_{50}$ Rat or Rabbit: > 20-200 mg/kg. Inhalation Toxicity LC$_{50}$ 4-hrs Rat: > 0.05-5 mg/L); 4 (Severe Hazard: Life-threatening; major or permanent damage may result from single or repeated exposure. Skin Irritation: Not appropriate. Do not rate as a “4”, based on eye irritation alone. Oral Toxicity LD$_{50}$ Rat: < 1 mg/kg. Dermal Toxicity LD$_{50}$ Rat or Rabbit: < 20 mg/kg. Inhalation Toxicity LC$_{50}$ 4-hrs Rat: < 0.05 mg/L)

FLAMMABILITY HAZARD:

0 (Minimal Hazard-Materials that will not burn in air when exposed to a temperature of 815.5°C [1500°F] for a period of 5 minutes;); 1 (Slight Hazard-Materials that must be pre-heated before ignition can occur. Material requires considerable pre-heating, under all ambient temperature conditions before ignition and combustion can occur. Including: Materials that will burn in air when exposed to a temperature of 815.5°C [1500°F] for a period of 5 minutes or less; Liquids, solids and semisolids having a flash point at or above 93.3°C [200°F] (e.g. OSHA Class III); or, Most ordinary combustible materials [e.g. wood, paper, etc.]; 2 (Moderate Hazard-Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not, under normal conditions, form hazardous atmospheres in air, but under high ambient temperatures or moderate heating may release vapor in sufficient quantities to produce hazardous atmospheres in air, including: Liquids having a flash-point at or above 37.8°C [100°F]; Solid materials in the form of course dusts that may burn rapidly but that generally do not form explosive atmospheres; Solid materials in a fibrous or shredded form that may burn rapidly and create flash fire hazards (e.g. cotton, sisal, hemp; Solids and semisolids that readily give off flammable vapors.); 3 (Serious Hazard- Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures, or, unaffected by ambient temperature, are readily ignited under almost all conditions, including: Liquids having a flash point below 22.8°C [73°F] and having a boiling point at or above 35°C [100°F] and below 37.8°C [100°F] (e.g. OSHA Class IB and IC); Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air [e.g., dusts of combustible solids, mists or droplets of flammable liquids]; Materials that burn extremely rapidly, usually by reason of self-contained oxygen [e.g. dry nitrocellulose and many organic peroxides]); 4 (Severe Hazard-Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air, and which will burn readily, including: Flammable gases; Flammable cryogenic materials; Any liquid or gaseous material that is liquid while under pressure and has a flash point below 22.8°C [73°F] and a boiling point below 37.8°C [100°F] (e.g. OSHA Class IA; Material that ignite spontaneously when exposed to air at a temperature of 54.4°C [130°F] or below [e.g. pyrophoric]).
HAZARDOUS MATERIALS IDENTIFICATION SYSTEM

HAZARD RATINGS (continued):

**PHYSICAL HAZARD:**

0 (Water Reactivity: Materials that do not react with water. Organic Peroxides: Materials that are normally stable, even under fire conditions and will not react with water. Explosives: Substances that are Non-Explosive. Unstable Compressed Gases: No Rating. Pyrophorics: No Rating. Oxidizers: No “0” rating allowed. Unstable Reactives: Substances that will not polymerize, decompose, condense or self-react.)

1 (Water Reactivity: Materials that change or decompose upon exposure to moisture. Organic Peroxides: Materials that are normally stable, but can become unstable at high temperatures and pressures. These materials may react with water, but will not release energy. Explosives: Division 1.5 & 1.6 substances that are very insensitive explosives or that do not have a mass explosion hazard. Compressed Gases: Pressure below OSHA definition. Pyrophorics: No Rating. Oxidizers: Packaging Group III; Solids: any material that, in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 3:7 potassium bromate/cellulose mixture and the criteria for Packing Group I and II are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise time of a 1:1 nitric acid (65%)/cellulose mixture and the criteria for Packing Group I and II are not met. Unstable Reactives: Substances that may decompose, condense or self-react, but only under conditions of high temperature and/or pressure and have little or no potential to cause significant heat generation or explosive hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors.)

2 (Water Reactivity: Materials that may react violently with water. Organic Peroxides: Materials that, in themselves, are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may also react violently with water. Explosives: Division 1.4 – Explosive substances where the explosive effect are largely confined to the package and no projection of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package. Compressed Gases: Pressurized and meet OSHA definition but < 514.7 psi absolute at 21.1°C (70°F) [500 psig]. Pyrophorics: No Rating. Oxidizers: Packaging Group II; Solids: any material that, either in concentration tested, exhibits a mean burning time of less than or equal to the mean burning time of a 2:3 potassium bromate/cellulose mixture and the criteria for Packing Group I are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise of a 1:1 aqueous sodium chloride solution (40%)/cellulose mixture and the criteria for Packaging Group I are not met. Unstable Reactives: Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential for significant heat generation or explosion. Substances that readily form peroxides at ambient temperature and/or pressure, but have a low potential for significant heat generation or explosion. Substances that readily form peroxides at ambient temperature and/or pressure, but have a low potential for significant heat generation or explosion. Substances that readily undergo hazardous polymerization in the absence of inhibitors.)

3 (continued): Explosives: Division 1.2 – Explosive substances that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but do not have a mass explosion hazard. Compressed Gases: Pressure ≥ 514.7 psi absolute at 21.1°C (70°F) [500 psig]. Pyrophorics: No Rating. Oxidizers: Packing Group I Solids: any material that, in either concentration tested, exhibits a mean burning time less than the mean burning time of a 3:2 potassium bromate/cellulose mixture. Liquids: Any material that spontaneously ignites when mixed with cellulose in a 1:1 ratio, or which exhibits a mean pressure rise time less than the pressure rise time of a 1:1 perchloric acid (50%)/cellulose mixture. Unstable Reactives: Substances that may polymerize, decompose, condense or self-react at ambient temperature and/or pressure and have a moderate potential to cause significant heat generation or explosion.)

Pyrophorics: No Rating. Oxidizers: Add to the definition of Flammability “4.” Oxidizers: No “4” rating. Unstable Reactives: Substances that may polymerize, decompose, condense or self-react at ambient temperature and/or pressure and have a high potential to cause significant heat generation or explosion.)

**NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS:**

HEALTH HAZARD: 0 (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials)

1 (materials that on exposure under fire conditions could cause irritation or minor residual injury)

2 (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury)

3 (materials that can on short exposure could cause serious temporary or residual injury)

4 (materials that under very short exposure could cause death or major residual injury)

**FLAMMABILITY HAZARD AND REACTIVITY HAZARD:** Refer to definitions for “Hazardous Materials Identification System”

**FLAMMABILITY LIMITS IN AIR:** Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA).

Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air.

Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition.

LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.
DEFINITIONS OF TERMS (Continued)

TOXICOLOGICAL INFORMATION:
Human and Animal Toxicology: Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: LD₅₀ - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; LC₅₀ - Lethal Concentration (gases) which kills 50% of the exposed animals; ppm concentration expressed in parts of material per million parts of air or water; mg/m³ concentration expressed in weight of substance per volume of air; mg/kg quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include TDLo, the lowest dose to cause a symptom and TCLo the lowest concentration to cause a symptom; TDo, LDLo, and LDo, or TC, TCo, LCLo, and LCo, the lowest dose (or concentration) to cause lethal or toxic effects. Cancer Information: The sources are: IARC - the International Agency for Research on Cancer; NTP - the National Toxicology Program, RTECS - the Registry of Toxic Effects of Chemical Substances, OSHA and CAL/OSHA. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other Information: BEI - ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

ECOLOGICAL INFORMATION:
BCF = Bioconcentration Factor, which is used to determine if a substance will concentrate in lifeforms which consume contaminated plant or animal matter; EC is the Effect Concentration in water; EC₅₀ is the Effect Concentration for 50% of the organisms exposed; NOEC is the No Observed Effect Concentration; MATC is the Maximum Acceptable Toxicant Concentration; TL₅₀ = median threshold limit; Coefficient of Oil/Water Distribution is represented by log Kow or log Koc and is used to assess a substance’s behavior in the environment.

REGULATORY INFORMATION:
U.S. and CANADA:
ACGIH: American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. This section explains the impact of various laws and regulations on the material. EPA is the U.S. Environmental Protection Agency. NIOSH is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA). WHMIS is the Canadian Workplace Hazardous Materials Information System. DOT and TC are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (SARA); the Canadian Domestic/Non-Domestic Substances List (DSL/NDSL); the U.S. Toxic Substance Control Act (TSCA); Marine Pollutant status according to the DOT; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund); and various state regulations. This section also includes information on the precautionary warnings which appear on the material’s package label. OSHA - U.S. Occupational Safety and Health Administration.