1. Chemical Product and Company Identification

Mittler Supply Inc.  
3607 South Main Street  
South Bend, IN 46614  
Telephone Number: (574) 291-5100  

Mittler Supply Inc.  
24-HOUR EMERGENCY TELEPHONE NUMBER  
CHEMTREC: (800) 424-9300  

For routine information contact your local Mittler Supply branch store.

PRODUCT NAME: CARBON MONOXIDE  
CHEMICAL NAME: Carbon Monoxide  
TRADE NAMES/SYNONYMS: Carbon Oxide, Exhaust Gas, and Flue Gas  
TDG (Canada) CLASSIFICATION: 2.3  
WHMIS CLASSIFICATION: A, D1A, D2A, D2B, and B1

MITTLER SUPPLY requests the users of this product study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

2. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>CAS NUMBER</th>
<th>% VOLUME</th>
<th>OSHA - PEL</th>
<th>TLV-ACGIH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>630-08-0</td>
<td>100.0</td>
<td>50 ppm TWA</td>
<td>25 ppm TWA</td>
</tr>
</tbody>
</table>

3. Hazards Identification

**EMERGENCY OVERVIEW**

Inhaled Carbon Monoxide binds to the blood hemoglobin, greatly reducing the red blood cell’s ability to transport oxygen to body tissues. Effects may include headaches, dizziness, convulsions, loss of consciousness, and death. Extremely flammable gas.

**Route of Entry:**

<table>
<thead>
<tr>
<th>Skin Contact</th>
<th>Skin Absorption</th>
<th>Eye Contact</th>
<th>Inhalation</th>
<th>Ingestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**Health Effects:**

<table>
<thead>
<tr>
<th>Exposure Limits</th>
<th>Irritant</th>
<th>Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teratogen</th>
<th>Reproductive Hazard</th>
<th>Mutagen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Synergistic Effects

None reported.

Carcinogenicity: -- NTP: No  
IARC: No  
OSHA: No

**Eye Effects:**

None reported.

**Skin Effects:**

None reported.
Ingestion Effects:
None reported.

Inhalation Effects:
Inhaled carbon monoxide binds with the blood hemoglobin to form carboxyhemoglobin. Carboxyhemoglobin can not take part in normal oxygen transport, greatly reducing the blood’s ability to transport oxygen. Depending on levels and duration of exposure, symptoms may include headache, dizziness, heart palpitations, weakness, confusion, nausea, and even convulsions, eventual unconsciousness and death.

Some experimental evidence indicating teratogenic and reproductive effects.

<table>
<thead>
<tr>
<th>NFPA HAZARD CODES</th>
<th>HMIS HAZARD CODES</th>
<th>RATINGS SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health: 2</td>
<td>Health: 2</td>
<td>0 = No Hazard</td>
</tr>
<tr>
<td>Flammability: 4</td>
<td>Flammability: 4</td>
<td>1 = Slight Hazard</td>
</tr>
<tr>
<td>Reactivity: 0</td>
<td>Reactivity: 0</td>
<td>2 = Moderate Hazard</td>
</tr>
</tbody>
</table>

4. First Aid Measures

Eyes:
None required

Skin:
None required

Ingestion:
None required.

Inhalation:
Conscious persons should be assisted to an uncontaminated area and be treated with supplemental oxygen. Quick removal form the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area and be given artificial respiration and be given oxygen at the same time. The adminis tering of the oxygen at en elevated pressure (up to 2 to 2.5 atmospheres) has shown to be beneficial as has treatment in a hyperbolic chamber. The physician should be informed that the patient has inhaled toxic quantities of carbon monoxide. PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO CARBON MONOXIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD.

5. Fire Fighting Measures

<table>
<thead>
<tr>
<th>Conditions of Flammability: Flammable Gas</th>
<th>Method: Not Applicable</th>
<th>Autoignition Temperature: 1125°F (607°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point: Not Available</td>
<td>UEL(%): 74.0</td>
<td></td>
</tr>
<tr>
<td>LEL(%): 12.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous combustion products: None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity to mechanical shock: None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity to static discharge: Not Available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fire and Explosion Hazards:
Having almost the same density as air, it will not diffuse by rising as with some lighter flammable gases such as hydrogen or natural gas (methane). Flammable in air over a very wide range. It reacts violently with oxygen difluoride and barium peroxide.

Extinguishing Media:
Water, dry chemical, carbon dioxide.

Fire Fighting Instructions:
If possible, stop flow of gas; use water spray to cool surrounding containers.

6. Accidental Release Measures
Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user’s equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container’s valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest Mittler location.

7. Handling and Storage
Electrical Classification:
Class 1, Group C

Earth-ground and bond all lines and equipment associated with the carbon monoxide system. Electrical equipment should be non-sparking or explosion proof.

Carbon monoxide can be handled in all commonly used metals up to approximately 500 psig (3450 kPa). Above that pressure it forms toxic and corrosive carbonyl compounds with some metals. Carbon steels, aluminum alloys, copper and copper alloys, low carbon stainless steels and nickel-based alloys such as Hastelloy A, B & C are recommended for higher pressure applications.

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 130°F (54°C). Cylinders should 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. Post “NO SMOKING OR OPEN FLAMES” signs in the storage area or the use area. There should be no sources of ignition in the storage area or use area.

Use only in well-ventilated areas. 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 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 system.

Engineering Controls:
Hood with forced ventilation. Use local exhaust to prevent accumulation above the exposure limit. Use general mechanical ventilation in accordance with electrical codes.

8. Exposure Controls, Personal Protection

Eye/Face Protection:
Safety goggles or glasses.

Skin Protection:
Protective gloves made of any suitable material.
Respiratory Protection:
Positive pressure air line with full-face mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

Other/General Protection:
Safety shoes.

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>VALUE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state (gas, liquid, solid)</td>
<td>Gas</td>
<td></td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>&gt;220.4 psia</td>
<td></td>
</tr>
<tr>
<td>Vapor density (Air = 1)</td>
<td>Not Available</td>
<td></td>
</tr>
<tr>
<td>Evaporation point</td>
<td>Not Available</td>
<td></td>
</tr>
<tr>
<td>Boiling point</td>
<td>-312.7 °F</td>
<td></td>
</tr>
<tr>
<td>Freezing point</td>
<td>-337.1 °F</td>
<td>°C</td>
</tr>
<tr>
<td>pH</td>
<td>Not Available</td>
<td></td>
</tr>
<tr>
<td>Specific gravity</td>
<td>0.96</td>
<td></td>
</tr>
<tr>
<td>Oil/water partition coefficient</td>
<td>Not Available</td>
<td></td>
</tr>
<tr>
<td>Solubility (H2O)</td>
<td>Very slight</td>
<td></td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td>Odor and appearance</td>
<td>A colorless, odorless gas</td>
<td></td>
</tr>
</tbody>
</table>

10. Stability and Reactivity

Stability:
Stable.

Incompatible Materials:
Oxidizers

Hazardous Decomposition Products:
Carbon Dioxide

Hazardous Polymerization:
Will not occur.

11. Toxicological Information

Reproductive:
Inhalation of 150 ppm carbon monoxide for 24 hours by pregnant rats produced cardiovascular and behavioral defects in offspring. Toxic effects to fertility were observed in female rats exposed to 1 mg/m³ for 24 hours. Similar effects observed in other mammalian species.

Mutagenic:
Genetic changes observed in mammalian cell assay systems at exposures of 1500 to 2500 ppm for 10 minutes.

Other:
Degenerative changes to the brain in rats chronically exposed to 30 mg/m³.
12. Ecological Information

No data given.

13. Disposal Considerations

Do not attempt to dispose of residual 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 an authorized distributor for proper disposal.

14. Transport Information

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>United States DOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name:</td>
<td>Carbon Monoxide</td>
</tr>
<tr>
<td>Hazard Class:</td>
<td>2.3</td>
</tr>
<tr>
<td>Identification Number:</td>
<td>UN 1016</td>
</tr>
<tr>
<td>Shipping Label:</td>
<td>Poison Gas, Flammable Gas</td>
</tr>
</tbody>
</table>

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

SARA TITLE III – HAZARD CLASSES:
Acute Health Hazard
Chronic Health Hazard
Fire Hazard
Sudden Release of Pressure Hazard

16. Other Information

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder, which has not been filled by the owner or with his/her (written) consent, is a violation of transportation regulations.

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