Material Name: CARBON MONOXIDE

Manufacturer Information
ADVANCED GAS TECHNOLOGIES
1401 Stauffer Road
Palm, PA 18070-0035
Mfg Contact: Outside the US: 703-572-3887 (Collect Calls Accepted)

Chemical Family
oxides of carbon

Synonyms
Carbonic acid gas; Carbonic anhydride; Carbon dioxide; Carbon oxide; Carbon dioxide gas; Carbon dioxide, carbonic anhydride; UN 1013; CO2; RTECS: FF6400000

** Section 2 - HAZARDS IDENTIFICATION **

** EMERGENCY OVERVIEW **
Color: colorless
Physical Form: gas
Odor: odorless
Health Hazards: difficulty breathing
Physical Hazards: Containers may rupture or explode if exposed to heat.

** POTENTIAL HEALTH EFFECTS **

** Inhalation **
Short Term: sensitivity to light, changes in blood pressure, nausea, irregular heartbeat, headache, drowsiness, dizziness, disorientation, sleep disturbances, emotional disturbances, tingling sensation, tremors, muscle cramps, visual disturbances, suffocation, convulsions, unconsciousness, coma
Long Term: difficulty breathing, disorientation, blood disorders

** Skin **
Short Term: blisters, frostbite
Long Term: no information on significant adverse effects

** Eye **
Short Term: irritation, blurred vision
Long Term: no information on significant adverse effects

** Ingestion **
Short Term: ingestion of a gas is unlikely
Long Term: ingestion of a gas is unlikely

** Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS **

<table>
<thead>
<tr>
<th>CAS</th>
<th>Component</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>124-38-9</td>
<td>Carbon monoxide</td>
<td>100</td>
</tr>
</tbody>
</table>
Component Related Regulatory Information
This product may be regulated, have exposure limits or other information identified as the following: Carbon
dioxide and ethylene oxide mixtures (8070-50-6).

*** Section 4 - FIRST AID MEASURES ***

Inhalation
If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is
difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Skin
If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE
HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical
attention.

Eyes
Flush eyes with plenty of water.

Ingestion
If a large amount is swallowed, get medical attention.

Note to Physicians
For inhalation, consider oxygen.

*** Section 5 - FIRE FIGHTING MEASURES ***

NFPA Ratings: Health: 0 Fire: 0 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Flammable Properties
Negligible fire hazard.

Extinguishing Media
carbon dioxide regular dry chemical
Large fires: Use regular foam or flood with fine water spray.

Fire Fighting Measures
Move container from fire area if it can be done without risk. Cool containers with water spray until well after the
fire is out. Stay away from the ends of tanks. Withdraw immediately in case of rising sound from venting safety
device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2
mile). Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after
the fire is out. Apply water from a protected location or from a safe distance. Do not get water directly on material.
Reduce vapors with water spray. Avoid inhalation of material or combustion by-products. Stay upwind and keep
out of low areas. Consider downwind evacuation if material is leaking.

*** Section 6 - ACCIDENTAL RELEASE MEASURES ***

Occupational spill/release
Stop leak if possible without personal risk. Keep unnecessary people away, isolate hazard area and deny entry.
Stay upwind and keep out of low areas.
**Section 7 - HANDLING AND STORAGE**

**Storage Procedures**

**Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Component Analysis**
Carbon monoxide (124-38-9)

<table>
<thead>
<tr>
<th></th>
<th>ACGIH</th>
<th>OSHA (final)</th>
<th>OSHA (vacated)</th>
<th>NIOSH</th>
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<tbody>
<tr>
<td></td>
<td>5000 ppm TWA</td>
<td>5000 ppm TWA; 9000 mg/m3 TWA</td>
<td>30000 ppm STEL; 54000 mg/m3 STEL</td>
<td>30000 ppm STEL; 54000 mg/m3 STEL</td>
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<tr>
<td></td>
<td>30000 ppm STEL</td>
<td>10000 ppm TWA; 18000 mg/m3 TWA</td>
<td>10000 ppm TWA; 18000 mg/m3 TWA</td>
<td>5000 ppm TWA; 9000 mg/m3 TWA</td>
</tr>
</tbody>
</table>

**IDLH**
40,000 ppm

**Ventilation**
Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT**

**Eyes/face**
Eye protection not required, but recommended.

**Protective Clothing**
For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing. Protective clothing is not required.

**Glove Recommendations**
Wear appropriate chemical resistant gloves. Protective gloves are not required, but recommended.

**Respiratory Protection**
The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
40,000 ppm
Any supplied-air respirator.
Any self-contained breathing apparatus with a full facepiece.
Emergency or planned entry into unknown concentrations or IDLH conditions -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Escape -
Any appropriate escape-type, self-contained breathing apparatus.
Under conditions of frequent use or heavy exposure, respiratory protection may be needed.
Respiratory protection is ranked in order from minimum to maximum.
Consider warning properties before use.

**For Unknown Concentrations or Immediately Dangerous to Life or Health -**
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

**Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**

- **Physical State:** Gas
- **Color:** colorless
- **Odor:** odorless
- **Taste:** acid taste
- **Melting Point:** -57 °C @ 4000 mmHg
- **Vapor Pressure:** 43700 mmHg @ 21 °C
- **Specific Gravity (water = 1):** 1.522 @ 21 °C
- **Sublimation Point:** -79 °C
- **Molecular Formula:** C-O2

Solvent Solubility
- **Soluble:** alcohol, acetone, hydrocarbons, organic solvents

**Section 10 - STABILITY AND REACTIVITY**

**Chemical Stability**
Stable at normal temperatures and pressure.

**Conditions to Avoid**
Protect from physical damage and heat. Containers may rupture or explode if exposed to heat.

**Materials to Avoid**
Combustible materials, oxidizing materials, metal salts, reducing agents, metal carbide, metals, bases.

**Possibility of Hazardous Reactions**
Will not polymerize.

**Section 11 - TOXICOLOGICAL INFORMATION**

**Component Analysis - LD50/LC50**
The components of this material have been reviewed in various sources and the following selected endpoints are published:
- **Carbon monoxide (124-38-9)**
  - Inhalation LC50 Mouse: 836 ppm/4H

**Acute Toxicity Level**
- **Carbon monoxide (124-38-9)**
  - Non Toxic: inhalation.

**Component Carcinogenicity**
None of this product's components are listed by ACGIH, IARC, NTP, OSHA or DFG.

**Target Organs**
- **Carbon monoxide (124-38-9)**
  - Central nervous system.

**Medical Conditions Aggravated by Exposure**
- Heart or cardiovascular disorders, respiratory disorders
**Section 12 - ECOLOGICAL INFORMATION**

**Component Analysis - Aquatic Toxicity**

No LOLI ecotoxicity data are available for this product's components.

**Section 13 - DISPOSAL CONSIDERATIONS**

**Disposal Methods**

Dispose in accordance with all applicable regulations.

**Component Waste Numbers**

The U.S. EPA has not published waste numbers for this product's components.

**Section 14 - TRANSPORT INFORMATION**

**US DOT Information**

- **Shipping Name:** Carbon dioxide
- **UN/NA #:** UN1013  **Hazard Class:** 2.2
- **Required Label(s):** 2.2

**TDG Information**

- **Shipping Name:** Carbon dioxide
- **UN #:** UN1013  **Hazard Class:** 2.2
- **Required Label(s):** 2.2

**Section 15 - REGULATORY INFORMATION**

**U.S. Federal Regulations**

None of this product's components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

**SARA 311/312**

- **Acute Health:** Yes  **Chronic Health:** No  **Fire:** No  **Pressure:** Yes  **Reactive:** No

**U.S. State Regulations**

The following components appear on one or more of the following state hazardous substances lists:

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<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>CA</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
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<tr>
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<td>124-38-9</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</tr>
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</table>

Not regulated under California Proposition 65

**Canada WHMIS**

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

**Carbon monoxide (124-38-9)**

1 %

**Component Analysis - Inventory**

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<tr>
<th>Component</th>
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<tbody>
<tr>
<td>Carbon monoxide</td>
<td>124-38-9</td>
<td>Yes</td>
<td>DSL</td>
<td>EIN</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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