**Section 1 - PRODUCT AND COMPANY IDENTIFICATION**

**Material Name:** CARBON DIOXIDE

**Manufacturer Information**
ADVANCED GAS TECHNOLOGIES
1401 Stauffer Road
Palm, PA 18070-0035

**General Information:**
1-800-416-2505

**Emergency #:**
1-800-424-9300 (CHEMTREC)

**Outside the US:**
703-527-3887 (Call collect)

**Chemical Family**
inorganic, gas

**Synonyms**
Mtg msds 17; Carbonic acid gas; Carbonic anhydride; Carbon dioxide; Carbon oxide; 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:** changes in blood pressure, ringing in the ears, nausea, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, tingling sensation, tremors, weakness, visual disturbances, suffocation, convulsions, unconsciousness, coma
- **Long Term:** no information on significant adverse effects

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

**Eye**
- **Short Term:** frostbite, 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 dioxide</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).

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### **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**
Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

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

**Note to Physicians**
For inhalation, consider oxygen.

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

**NFPA Ratings:**
- Health: 3
- Fire: 0
- Reactivity: 0

**Hazard Scale:**
0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

**Flammable Properties**
Negligible fire hazard. Containers may rupture or explode if exposed to heat.

**Extinguishing Media**
Use extinguishing agents appropriate for surrounding fire.

**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. 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. Do not get water directly on material. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

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

**Occupational spill/release**
Do not touch spilled material. Stop leak if possible without personal risk. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering.

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### **Section 7 - HANDLING AND STORAGE**

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

### Component Analysis

**Carbon dioxide (124-38-9)**
- **ACGIH:**
  - 5000 ppm TWA
  - 30000 ppm STEL
- **OSHA (final):**
  - 5000 ppm TWA; 9000 mg/m³ TWA
- **OSHA (vacated):**
  - 30000 ppm STEL; 54000 mg/m³ STEL
  - 10000 ppm TWA; 18000 mg/m³ TWA
- **NIOSH:**
  - 30000 ppm STEL; 54000 mg/m³ STEL
  - 5000 ppm TWA; 9000 mg/m³ TWA

### Component Biological Limit Values

There are no biological limit values for any of this product's components.

### IDLH

40,000 ppm

### Ventilation

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

### PERSONAL PROTECTIVE EQUIPMENT

#### Eyes/Face

For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

#### Protective Clothing

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

#### Glove Recommendations

Wear insulated gloves.

### 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.

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**Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**
**Safety Data Sheet**

**Material Name:** CARBON DIOXIDE  
**SDS ID:** 00233326

**Physical State:** Gas  
**Color:** colorless  
**Odor:** odorless  
**Taste:** acid taste  
**Melting/Freezing Point:** -57 °C @4000 mmHg  
**Flash Point:** none  
**Vapor Density (air = 1):** 1.5  
**Water Solubility:** soluble  
**Auto Ignition:** Not available  
**Sublimation Point:** -78.50 °C  
**Vapor Density by Volume:** 100 %  
**Molecular Formula:** C-O2

**Appearance:** Not available  
**Physical Form:** gas  
**Odor Threshold:** Not available  
**pH:** acidic in solution  
**Boiling Point:** -78.50 - 61.7 °C (liquid)  
**Decomposition:** Not available  
**Vapor Pressure:** 43700 mmHg @ 21 °C  
**Specific Gravity (water=1):** 1.527 @ 21 °C  
**Vapor Density (air = 1):** Not available  
**Specific Gravity (water=1):** 1.527 @ 21 °C  
**Water Solubility:** soluble  
**Log KOW:** Not available  
**Auto Ignition:** Not available  
**Viscosity:** 0.000000203 Pa.s @20 °C  
**Sublimation Point:** -78.50 °C  
**Triple Point:** -56.6 °C @3883.6 mmHg  
**Molecular Weight:** 44.01

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

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### 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. Avoid contact with water or moisture.

**Materials to Avoid**  
combustible materials, oxidizing materials, metal salts, reducing agents, metal carbide, metals, bases, potassium, sodium, ethyleneimine

**Decomposition Products**  
oxides of carbon

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

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### 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 dioxide (124-38-9)  
Inhalation LC50 Mouse 836 ppm 4 h (related to Carbon dioxide and ethylene oxide mixtures)

**Acute Toxicity Level**  
Carbon dioxide (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 dioxide (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 products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), 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>
<th>PA</th>
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<tbody>
<tr>
<td>Carbon dioxide</td>
<td>124-38-9</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Not regulated under California Proposition 65

Canada WHMIS
The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List
Carbon dioxide (124-38-9)
1 %

Component Analysis - Inventory

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>US</th>
<th>CA</th>
<th>EU</th>
<th>AU</th>
<th>PH</th>
<th>JP</th>
<th>KR</th>
<th>CN</th>
<th>NZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide</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>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
** * * * Section 16 - OTHER INFORMATION* * * *

Key / Legend

- ACGIH - American Conference of Governmental Industrial Hygienists;
- ADR - European Road Transport;
- AU - Australia;
- BOD - Biochemical Oxygen Demand;
- C - Celsius;
- CA - Canada;
- CAS - Chemical Abstracts Service;
- CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act;
- CN - China;
- CPR - Controlled Products Regulations;
- DFG - Deutsche Forschungsgemeinschaft;
- DOT - Department of Transportation;
- DSL - Domestic Substances List;
- EEC - European Economic Community;
- EINECS - European Inventory of Existing Commercial Chemical Substances;
- EPA - Environmental Protection Agency;
- EU - European Union;
- F - Farenheit;
- IARC - International Agency for Research on Cancer;
- IATA - International Air Transport Association;
- ICAO - International Civil Aviation Organization;
- IDL - Ingredient Disclosure List;
- IMDG - International Maritime Dangerous Goods;
- JP - Japan;
- Kow - Octanol/water partition coefficient;
- KR - Korea;
- LEL - Lower Explosive Limit;
- Lولي - List Of Lists™ - ChemADVISOR's Regulatory Database;
- MAK - Maximum Concentration Value in the Workplace;
- MEL - Maximum Exposure Limits;
- NFPA - National Fire Protection Agency;
- NIOSH - National Institute for Occupational Safety and Health;
- NJTSR - New Jersey Trade Secret Registry;
- NTP - National Toxicology Program;
- NZ - New Zealand;
- OSHA - Occupational Safety and Health Administration;
- PH - Philippines;
- RCRA - Resource Conservation and Recovery Act;
- RID - European Rail Transport;
- RTECS - Registry of Toxic Effects of Chemical Substances®;
- SARA - Superfund Amendments and Reauthorization Act;
- STEL - Short-term Exposure Limit;
- TDG - Transportation of Dangerous Goods;
- TSCA - Toxic Substances Control Act;
- TWA - Time Weighted Average;
- UEL - Upper Explosive Limit;
- US - United States

Other Information

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End of Sheet 00233326