

Section 1: Product and Company Identification

Advanced Specialty Gases
135 Catron Dr. Reno, NV 89512
775-356-5500

IN CASE OF EMERGENCY CALL CHEMTREC: 1-800-424-9300

Product Code: Carbon Monoxide

Section 2: Hazards Identification



Danger

Hazard Classification:

Acute Gas Inhale Toxicity (Category 3)
Flammable (Category 1)
Gases Under Pressure
Reproductive Toxicity (Category 1.A)
Specific target organ toxicity (Repeated Exposure) (Category 1)

Hazard Statements:

Causes damage to organs through prolonged or repeated exposure
Contains gas under pressure; may explode if heated
Extremely flammable gas
May damage fertility or the unborn child
Toxic if inhaled

Precautionary Statements

Prevention:

Do not breathe dust/fume/gas/mist/ vapors/spray..
Do not eat, drink or smoke when using this product.
[In case of inadequate ventilation] wear respiratory protection.
Do not handle until all safety precautions have been read and understood.
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves, protective clothing, eye protection and face protection.
Obtain special instructions before use.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Response:

Eliminate all ignition sources if safe to do so.
If exposed or concerned: Get medical advice/attention.
If inhaled: Remove person to fresh air and keep comfortable for breathing.

Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Call a poison center or doctor.

Storage:

Store in a well-ventilated place. Keep container tightly closed.
Protect from sunlight.
Store locked up.

Disposal:

Dispose of contents and/or container in accordance with applicable regulations.

Section 3: Composition/Information on Ingredients

| |
|--------------|
| CAS # |
| 630-08-0 |

| Chemical Substance | Chemical Family | Trade Names |
|--------------------|-----------------|--|
| CARBON MONOXIDE | Inorganic gases | CARBON OXIDE; CARBON OXIDE (CO); UN 1016; CO |

Section 4: First Aid Measures

| Skin Contact | Eye Contact | Ingestion | Inhalation | Note to Physicians |
|--|--|--|--|----------------------------------|
| Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse. | Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention. | If a large amount is swallowed, get medical attention. | 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. | For inhalation, consider oxygen. |

Section 5: Fire Fighting Measures

| Suitable Extinguishing Media | Products of Combustion | Protection of Firefighters |
|--|------------------------|---|
| Carbon dioxide, regular dry chemical Large fires: Use regular foam or flood with fine water spray. | Carbon dioxide | <ul style="list-style-type: none">Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. |

Section 6: Accidental Release Measures

| Personal Precautions | Environmental Precautions | Methods for Containment |
|--|--|--|
| Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. | Avoid heat, flames, sparks and other sources of ignition. Keep out of water supplies and sewers. | Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition. |

| Methods for Cleanup | Other Information |
|--|---|
| Stop leak, evacuate area. Wear protective equipment. | Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). |

Section 7: Handling and Storage

| Handling | Storage |
|--|---|
| Keep separated from incompatible substances. | Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. |

Section 8: Exposure Controls/Personal Protection

Exposure Guidelines

CARBON MONOXIDE: 50 ppm (55 mg/m³) OSHA TWA 35 ppm (40 mg/m³) OSHA TWA (vacated by 58 FR 35338, June 30, 1993) 200 ppm (229 mg/m³) OSHA ceiling (vacated by 58 FR 35338, June 30, 1993) 25 ppm ACGIH TWA 35 ppm (40 mg/m³) NIOSH recommended TWA 10 hour(s) 200 ppm (229 mg/m³) NIOSH recommended ceiling

Engineering Controls

Handle only in fully enclosed systems.

| Eye Protection | Skin Protection | Respiratory Protection |
|---|--------------------------------------|---|
| Eye protection not required, but recommended. | Protective clothing is not required. | Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. |

General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

Section 9: Physical and Chemical Properties

| Physical State | Appearance | Color | Change in Appearance | Physical Form | Odor | Taste |
|----------------|------------|-----------|----------------------|---------------|----------|-----------|
| Gas | Colorless | Colorless | N/A | Gas | Odorless | Tasteless |

| Flash Point | Flammability | Partition Coefficient | Autoignition Temperature | Upper Explosive Limits | Lower Explosive Limits |
|-------------|---------------|--|--------------------------|------------------------|------------------------|
| Flammable | Not available | 1479.11 (log = 3.17) (estimated from water solubility) | 1128-1202 F (609-650 C) | 0.74 | 12.0-12.5% |

| Boiling Point | Freezing Point | Vapor Pressure | Vapor Density | Specific Gravity | Water Solubility | pH | Odor Threshold | Evaporation Rate | Viscosity |
|---------------------|-----------------|--|---------------|------------------|------------------|----------------|----------------|------------------|------------------|
| -312.7 F (-191.5 C) | -326 F (-199 C) | 760 mmHg @ -191 C gas; cannot be liquefied at room temperature | 0.968 (Air=1) | Not applicable | 2.3% @ 20 C | Not applicable | Not available | Not applicable | 0.01657 cP @ 0 C |

| Molecular Weight | Molecular Formula | Density | Weight per Gallon | Volatility by Volume | Volatility | Solvent Solubility |
|------------------|-------------------|-----------------|-------------------|----------------------|----------------|---|
| 28.01 | C-O | 1.250 g/L @ 0 C | Not available | 100% | Not applicable | Soluble: Alcohol, benzene, acetic acid, ethyl acetate, chloroform, cuprous chloride solutions |

Section 10: Stability and Reactivity

| Stability | Conditions to Avoid | Incompatible Materials |
|---|---|---|
| Stable at normal temperatures and pressure. | Stable at normal temperatures and pressure. | Oxidizing materials, halogens, metal oxides, metals, combustible materials, lithium |

| Hazardous Decomposition Products | Possibility of Hazardous Reactions |
|----------------------------------|------------------------------------|
| Oxides of carbon | Will not polymerize. |

Section 11: Toxicology Information

Acute Effects

| Oral LD50 | Dermal LD50 | Inhalation |
|---|---------------|--|
| LC50 Inhalation Gas. Rat 1807 ppm 4 hours | Not available | Changes in body temperature, changes in blood pressure, nausea, vomiting, chest pain, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, disorientation, hallucinations, pain in extremities, tremors, loss of coordination, hearing loss, visual disturbances, eye damage, suffocation, blood disorders, convulsions, coma |

| Eye Irritation | Skin Irritation | Sensitization |
|---|---|---|
| No information on significant adverse effects | No information on significant adverse effects | Acute toxicity, Category 3, inhalation; H331: Toxic if inhaled. Reproductive toxicity, Category 1A; H360D: May damage the unborn child. Specific Target Organ Toxicity (repeated exposure), Category 1; H372: Causes damage to organs through prolonged or repeated exposure. |

Chronic Effects

| Carcinogenicity | Mutagenicity | Reproductive Effects | Developmental Effects |
|-----------------|--------------|----------------------|-----------------------|
| Not available | Available. | Available. | No data |

Section 12: Ecological Information

Fate and Transport

| Eco toxicity | Persistence / Degradability | Bioaccumulation / Accumulation | Mobility in Environment |
|---|---|--------------------------------|---|
| Fish toxicity: 75000 ug/L 1 day(s) LC100 (Mortality) Orangespotted sunfish (Lepomis humilis) Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available | Relatively non-persistent in the environment. Highly volatile from water. | Not available | Not expected to leach through the soil or the sediment. |

Section 13: Disposal Considerations

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

| Proper Shipping Name | ID Number | Hazard Class or Division | Packing Group | Labeling Requirements | Passenger Aircraft or Railcar Quantity Limitations | Cargo Aircraft Only Quantity Limitations | Additional Shipping Description |
|-----------------------------|-----------|--------------------------|----------------|-----------------------|--|--|---------------------------------|
| Carbon monoxide, compressed | UN1016 | 2.3 | Not applicable | 2.3; 2.1 | Forbidden | 25 kg | Toxic-Inhalation Hazard Zone D |

Canadian Transportation of Dangerous Goods

| Shipping Name | UN Number | Class | Packing Group / Risk Group |
|-----------------------------|-----------|----------|----------------------------|
| Carbon monoxide, compressed | UN1016 | 2.3; 2.1 | Not applicable |

Section 15: Regulatory Information

U.S. Regulations

| CERCLA Sections | SARA 355.30 | SARA 355.40 |
|-----------------|----------------|----------------|
| Not regulated. | Not regulated. | Not regulated. |

SARA 370.21

| Acute | Chronic | Fire | Reactive | Sudden Release |
|-------|---------|------|----------|----------------|
| Yes | No | Yes | No | Yes |

SARA 372.65

Not regulated.

OSHA Process Safety

Not regulated.

State Regulations

CA Proposition 65

WARNING: This product can expose you to chemicals including Carbon Monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Canadian Regulations

WHMIS Classification

A, B1, D1A, D2A.

National Inventory Status

| US Inventory (TSCA) | TSCA 12b Export Notification | Canada Inventory (DSL/NDSL) |
|----------------------|------------------------------|-----------------------------|
| Listed on inventory. | Not listed. | Listed on inventory. |

Section 16: Other Information

NFPA Rating

HEALTH=2 FIRE=4 REACTIVITY=0

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard