

STOODY INDUSTRIAL AND WELDING SUPPLY, INC.

MATERIAL SAFETY DATA SHEET (MSDS)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Carbon dioxide (Fire and Technical)

CHEMICAL NAME: Carbon dioxide

CHEMICAL FAMILY: Acid anhydride

FORMULA: CO₂

SYNONYMS: Carbonic anhydride, Carbonic acid gas, Carbon Anhydride, Carbon Dioxide USP

NAME AND ADDRESS:

STOODY INDUSTRIAL AND WELDING SUPPLY, INC.
3316 National Avenue
San Diego, CA 92113

TELEPHONE:

Emergency Phone: (800) 633-8253 (24 hr.)
Routine information call: (619) 234-6750
Weekdays 7:30 AM – 5:00 PM

[USE]: Various.

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME /CAS NUMBER	PERCENTAGE	OSHA PEL	ACGIH TLV
CARBON DIOXIDE/124-38-9 [LD ₅₀]: None. [LC ₅₀]: None.	>99%	5000 ppm	5000 ppm

3. COMPOSITION/INFORMATION ON INGREDIENTS

EMERGENCY OVERVIEW

CAUTION! High pressure liquid and gas.
Can cause rapid suffocation.
Can increase respiration and heart rate.
May cause frostbite.
Avoid breathing gas.
Self-contained breathing apparatus may be required by rescue workers.

POTENTIAL HEALTH EFFECTS INFORMATION:

ROUTES OF EXPOSURE:

INHALATION: Carbon dioxide is an asphyxiant. Concentration of 10% or more can produce unconsciousness or death. Lower concentrations may cause headache, sweating, rapid breathing, increased heartbeat, shortness of breath, dizziness, mental depression, visual disturbances, and shaking.

EYE CONTACT: Contact with liquid or cold vapor can cause freezing of tissue.

SKIN CONTACT: Contact with liquid or cold vapor can cause frostbite.

[SKIN ABSORPTION]: Not applicable.

[INGESTION]: Not applicable.

CHRONIC EFFECTS: None established.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None

OTHER EFFECTS OF OVEREXPOSURE: Damage to retinal ganglion cells and central nervous system may occur.

CARCINOGENICITY: Carbon dioxide is not listed by NTP, OSHA or IARC.

4. FIRST AID MEASURES

INHALATION: Persons suffering from overexposure should be moved to fresh air. If victim is not breathing, administer artificial respiration. If breathing is difficult, administer oxygen. Obtain prompt medical attention.

EYE CONTACT: Contact with liquid or cold vapor can cause freezing of tissue. Gently flush eyes with lukewarm water. Obtain medical attention immediately.

SKIN CONTACT: Contact with liquid or cold vapor can cause frostbite. Immediately warm affected area with lukewarm water not to exceed 105°F (40°C).

INGESTION: Not applicable.

NOTES TO PHYSICIAN: There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION: Nonflammable.

FLAMMABLE LIMITS IN AIR BY VOLUME:

STOODY INDUSTRIAL AND WELDING SUPPLY, INC.

LOWER: Not applicable. **UPPER:** Not applicable.

EXTINGUISHING MEDIA: Carbon dioxide is nonflammable and does not support combustion. Carbon dioxide is an extinguishing agent for class B and C fires. Use extinguishing media appropriate for the surrounding fire.

SPECIAL FIRE FIGHTING INSTRUCTIONS: Evacuate personnel from danger area. Carbon dioxide is nonflammable. If possible, without risk, remove carbon dioxide cylinders from fire area or cool with water. Self-contained breathing apparatus may be required for rescue workers.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Upon exposure to intense heat or flame cylinder may vent rapidly and/or rupture violently. Most cylinders are designed to vent contents when exposed to elevated temperatures. Pressure in a container can build up due to heat and it may rupture if pressure relief devices should fail to function.

HAZARDOUS COMBUSTION PRODUCTS: None known.

[SENSITIVITY TO STATIC DISCHARGE]: None

[SENSITIVITY TO MECHANICAL IMPACT]: None

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Evacuate all personnel from the affected area. Shut off source of carbon dioxide, if possible without risk. Ventilate enclosed areas or remove cylinders to an outdoor location. If leaking from cylinder or its valve, contact your supplier.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling or being knocked over. Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 125°F (52°C). Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time.

PRECAUTIONS TO BE TAKEN IN HANDLING: Use a suitable hand truck for cylinder movement. Never attempt to lift a cylinder by its valve protection cap. Never apply flame or localized heat directly to any part of the cylinder. High temperature may cause damage to cylinder and/or premature failure of pressure relief device which will result in venting of cylinder contents. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Never insert an object (e.g., wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. For additional precautions in using carbon dioxide see Section 16 - Other Information.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**ENGINEERING CONTROLS:**

VENTILATION: Natural or mechanical to prevent accumulation in worker's breathing zone above exposure limits. (See Section 2).

RESPIRATORY PROTECTION (SPECIFY TYPE):

General Use: None required.

Emergency Use: Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen deficient atmosphere. Air purifying respirators will not provide protection.

PROTECTIVE GLOVES: Work gloves are recommended when handling cylinders.

EYE PROTECTION: Safety glasses are recommended when handling cylinders.

OTHER PROTECTIVE EQUIPMENT: Safety shoes are recommended when handling cylinders.

9. PHYSICAL AND CHEMICAL PROPERTIES

MOLECULAR WEIGHT: 44.01

BOILING POINT (1 ATM): -109.3°F (-78.5°C)

SPECIFIC GRAVITY (Air =1): At 70°F (21.1°C) and 1 atm: 1.522

FREEZING POINT/MELTING POINT: At 1 atm: Not applicable. Sublimation temperature is -109.3°F (-78.5°C).

VAPOR PRESSURE (AT 70°F): 838 psig (5778 kPa)

GAS DENSITY: At 70°F (21.1°C) and 1 atm: 0.1144 lb/ft³ (1.833 kg/m³)

EVAPORATION RATE (Butyl Acetate=1): Gas, not applicable.

SOLUBILITY IN WATER: Vol/Vol at 68° F (20°C): 0.90

EXPANSION RATIO: Not applicable.

[pH]: 3.7 at 1 atm (for carbonic acid).

APPEARANCE, ODOR AND STATE: Colorless and odorless. A slightly acid gas, it is felt by some persons to have a slight pungent odor and biting taste.

[COEFFICIENT OF WATER/OIL DISTRIBUTION]: Not applicable.

[ODOR THRESHOLD]: Odorless.

STOODY INDUSTRIAL AND WELDING SUPPLY, INC.**10. STABILITY AND REACTIVITY****STABILITY:** None**CONDITIONS TO AVOID:** None**INCOMPATIBILITY (Materials to Avoid):** Carbon dioxide will react with alkaline materials to form carbonates and bicarbonates.**REACTIVITY:**

- A) **HAZARDOUS DECOMPOSITION PRODUCTS:** Carbon monoxide and oxygen at temperatures above 3000°F (1648.9°C).
- B) **HAZARDOUS POLYMERIZATION:** Will not occur.

11. TOXICOLOGICAL INFORMATION

Carbon dioxide is an asphyxiant. It initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Symptoms in humans are as follows:

<u>EFFECT</u>	<u>CONCENTRATION</u>
Slight increase in breathing rate	1%
Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness.	2%
Breathing increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increase in blood pressure and pulse rate.	3%
Breathing increases to approximately four times normal rate, symptoms of intoxication become evident and slight choking may be felt.	4-5%
Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness.	5-10%
Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.	50-100%

[IRRITANCY OF MATERIAL]: None.**[SENSITIZATION TO MATERIAL]:** None.**[REPRODUCTIVE EFFECTS]:** None.**[TERATOGENICITY]:** None.**[MUTAGENICITY]:** None.**[SYNERGISTIC MATERIALS]:** None**12. ECOLOGICAL INFORMATION**

No adverse ecological effects are expected. Carbon dioxide does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82). Carbon dioxide is not listed as a marine pollutant by DOT (49 CFR Part 171).

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier. For emergency disposal, secure the cylinder and slowly discharge gas to the atmosphere in a well ventilated area or outdoors.

14. TRANSPORT INFORMATION**DOT/IMO SHIPPING NAME:** Carbon dioxide.**HAZARD CLASS:** 2.2 (Nonflammable Gas)**IDENTIFICATION NUMBER:** UN 1013**[PIN]:** 1013**PRODUCT RQ:** None**SHIPPING LABEL(s):** Nonflammable gas.**PLACARD (When required):** Nonflammable gas.

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

15. REGULATORY INFORMATION

The following information concerns selected regulatory requirements potentially applicable to this product. Not all such requirements are identified. Users of this product are responsible for their own regulatory compliance on a federal, state [provincial], and local level.

U.S. FEDERAL REGULATIONS:**EPA - ENVIRONMENTAL PROTECTION AGENCY**

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CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (40 CFR Parts 117 and 302):
Reportable Quantity (RQ): None

SARA: Superfund Amendment and Reauthorization Act

SECTION 302/304: Requires emergency planning on threshold planning quantities (TPQ) and release reporting based on reportable quantities (RQ) of EPA's extremely hazardous substances (40 CFR Part 355).

Extremely Hazardous Substances: None

Threshold Planning Quantity (TPQ): None

SECTIONS 311/312: Require submission of material safety data sheets (MSDSs) and chemical inventory reporting with identification of EPA defined hazard classes (40 CFR Part 370). The hazard classes for this product are:

IMMEDIATE:	Yes	PRESSURE:	Yes
DELAYED:	No	REACTIVITY:	No
		FIRE:	No

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Carbon dioxide does not require reporting under Section 313

40 CFR PART 68: Risk Management for Chemical Accidental Release. Requires the development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Carbon dioxide is not listed as a regulated substance.

TSCA: Toxic Substance Control Act: Carbon dioxide is listed on the TSCA inventory.

OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: Process Safety Management of Highly Hazardous Chemicals. Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals as listed in Appendix A.

Carbon dioxide is not listed in Appendix A as a highly hazardous chemical.

FDA - FOOD AND DRUG ADMINISTRATION

21CFR 184.1240: Generally recognized as safe (GRAS) as a direct human food ingredient when used as a leavening agent, processing aid, propellant, aerating agent and gas.

Carbon dioxide USP is regulated by FDA as a prescription drug.

[CANADIAN REGULATIONS:]

[Controlled Product Hazard Class A. This MSDS has been prepared in compliance with Controlled Product Regulations.]

16. OTHER INFORMATION

SPECIAL PRECAUTIONS: Use piping and equipment adequately designed to withstand pressures to be encountered. Use a check valve or other protective apparatus in any line or piping from the cylinder to prevent reverse flow.

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)).

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 produce 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.

OTHER INFORMATION:**NFPA RATINGS:**

HEALTH:	= 1
FLAMMABILITY:	= 0
REACTIVITY:	= 0
SPECIAL:	= SA (CGA recommends this to designate simple asphyxiant)

HMIS RATINGS:

HEALTH:	= 0
FLAMMABILITY:	= 0
REACTIVITY:	= 0

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	CGA 320
PIN-INDEXED YOKE:	CGA 940 (Medical Use)
ULTRA HIGH INTEGRITY	716

Use the proper CGA connections, DO NOT USE ADAPTERS

Further information about carbon dioxide 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.

G-6	<i>Carbon Dioxide</i>
G-6.1	<i>Standard for Low Pressure Carbon Dioxide Systems at Customer Sites</i>
G-6.2	<i>Commodity Specification for Carbon Dioxide</i>
G-6.3	<i>Carbon Dioxide Cylinder Filling and Handling Procedures</i>
P-14	<i>Accident Prevention in Oxygen-Rich, Oxygen-Deficient Atmospheres</i>
SB-2	<i>Oxygen Deficient Atmospheres</i>

CARBON DIOXIDE

Effective Date: December, 1995

STOODY INDUSTRIAL AND WELDING SUPPLY, INC.

AV-1 *Safe Handling and Storage of Compressed Gases*

[PREPARED BY]: Compressed Gas Association

[REFORMATTED BY]: Stody Industrial and Welding Supply, Inc.