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AMEREX CORPORATION
 7595 Gadsden Highway
 P. O. Box 81
 Trussville, Alabama 35173-0081
MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards¹

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED): CARBON DIOXIDE
SYNONYMS: Carbonic Anhydride, Carbonic Acid
MANUFACTURER'S NAME: AMEREX CORPORATION
ADDRESS: P.O. BOX 81
 Trussville, AL 35173-0081
EMERGENCY PHONE: 1-800-424-9300 (CHEMTREC)
BUSINESS PHONE: (205) 655-3271
REVIEWED: MARCH 1, 2001

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% v/v	EXPOSURE LIMITS IN AIR					OTHER
			ACGIH		OSHA			
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	
CARBON DIOXIDE	124-38-9	100	5000	30,000	5000	NE	50,000	NIOSH REL: 5000 ppm; 30,000 ppm STEL. DFG MAK: 500 ppm

NE = Not Established C = Ceiling Level See Section 16 for Definitions of Terms Used

¹ NOTE: all WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

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3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is an odorless, colorless gas which can cause asphyxiation. Though the mixture is not flammable, if the product's cylinders are exposed to high temperatures, they may rupture violently and cause a high-pressure release of gas.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of exposure for this product is inhalation.

INHALATION: Although unlikely to occur during use of one fire extinguishing unit, exposure to high concentrations of this gas may cause an oxygen deficient environment. Individuals breathing such


an atmosphere may experience dizziness, drowsiness, unconsciousness, and death, under some circumstances. Inhalation of carbon dioxide can affect the central nervous system and blood vessels, as well as change the rate of respiration.

CONTACT WITH SKIN or EYES: Contact with liquid or rapidly expanding gases may cause burns or frostbite.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms.** This product poses low, acute health risks.

ACUTE: This extinguishing material presents a slight risk of causing acute health effects. Exposure symptoms would occur upon breathing high concentrations of this gas in a poorly ventilated environment.

CHRONIC: This product is not known to cause any industrial illnesses or diseases.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH	(BLUE)	1	
FLAMMABILITY	(RED)	0	
REACTIVITY	(YELLOW)	0	
PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		
For routine industrial applications			

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

This product is a gas; therefore, exposure via ingestion, ingestion, skin contact, or eye contact would be unlikely. Should exposure via inhalation occur, remove victims to fresh air, as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen.

In case of frostbite, place the frostbitten part in warm water. If warm water is not available, or impractical to use, wrap the affected parts gently in blankets.

If exposure causes obvious distress, victim(s) and rescuers must be taken for medical attention. Take copy of label and MSDS to physician or health professional with victim.

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5. FIRE-FIGHTING MEASURES

FLASH POINT, Degree C (method): Not applicable.

NFPA RANKING - HEALTH=1, FLAMMABILITY=0, REACTIVITY=0, OTHER=0

AUTOIGNITION TEMPERATURE, Degree C: Not applicable.

FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): Not applicable.
Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: None. This product is a fire extinguishing agent.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this cylinder under may rupture violently, causing a high pressure release of gases.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Keep unused cylinders cool using a water spray. Structural fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area, protect people, and respond with trained personnel. For uncontrolled releases, respond wearing Self-Contained Breathing Apparatus. Monitor the surrounding area for oxygen content. The atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Ventilate the affected area.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: Avoid getting chemicals ON YOU or IN YOU. Wash hands after handling chemicals. Do not eat or drink while handling chemicals. Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of this product could occur without any significant warning symptoms.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Keep cylinders in dry, well-ventilated areas which are away from sources of heat. Keep cylinders secure.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Decontaminate equipment using soapy water before maintenance begins. Collect all rinsates and dispose of according to applicable Federal, State, or local procedures.

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8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Use a mechanical fan or vent area to outside.

RESPIRATORY PROTECTION: Use supplied air respiratory protection if oxygen levels are below 19.5%.

EYE PROTECTION: Safety glasses.

HAND PROTECTION: None normally required.

BODY PROTECTION: Use body protection appropriate for task.

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY: 1.52

SPECIFIC GRAVITY: Approximately 1.3

SOLUBILITY IN WATER: Soluble.

VAPOR PRESSURE, mm Hg @ 20 Degrees C: Not applicable.

APPEARANCE AND COLOR: This product is an odorless, compressed gas.

HOW TO DETECT THIS SUBSTANCE (warning properties): This product does not have any specific warning properties.

EVAPORATION RATE (n-BuAc=1): Not available.

MELTING POINT or RANGE: Sublimes, -78 degrees C.

BOILING POINT: Sublimes.

pH (10% solution): Not applicable.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Not applicable.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Upon contact with moisture, carbon dioxide can form carbonic acid. Carbon dioxide is also incompatible with chemically active metals, such as sodium, potassium, and titanium.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Incompatible materials.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following data is available for components of this product greater than 1 percent by weight in concentration.

Carbon Dioxide: This gas is a simple asphyxiant with physiological effects at high concentration.

TCLo(inhalation, rat) = 6 pph/24 hours; reproductive and teratogenic effects

LCLo(inhalation, human) = 9 pph/5 minutes

LCLo(inhalation, mammal) = 90,000 ppm/5 minutes

SUSPECTED CANCER AGENT: This product's ingredients are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA., IARC.

IRRITANCY OF PRODUCT: This product may cause mild skin and moderate eye irritancy.

SENSITIZATION TO THE PRODUCT: This product is not known to cause sensitization.

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11. TOXICOLOGICAL INFORMATION (Continued)

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: This product is not known to cause mutagenic effects.

Teratogenicity: This product is not known to cause teratogenic effects.

Reproductive Toxicity: This product is not known to cause reproductive toxicity effects.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Contact with this product may aggravate pre-existing respiratory conditions.

RECOMMENDATIONS TO PHYSICIANS: Treat patient symptoms. Administer oxygen, as necessary.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: No adverse environmental consequences are expected. All gases in this mixture occur naturally in the environment. The gas will dissipate rapidly in well ventilated areas.
EFFECT OF MATERIAL ON PLANTS or ANIMALS: None currently known.
EFFECT OF CHEMICAL ON AQUATIC LIFE: Not expected to harm aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Residue from fires extinguished with this material may be hazardous.
EPA WASTE NUMBER: Not applicable.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

<u>PROPER SHIPPING NAME:</u>	Fire Extinguishers (Carbon Dioxide).
<u>HAZARD CLASS NUMBER and DESCRIPTION:</u>	2.2 (Non-flammable gas)
<u>UN IDENTIFICATION NUMBER:</u>	UN 1013.
<u>PACKING GROUP:</u>	Not applicable.
<u>DOT LABEL(S) REQUIRED:</u>	Not applicable (see note below).
<u>EMERGENCY RESPONSE GUIDE NUMBER:</u>	Not applicable.

Note: Fire extinguishers fall under the exception category for labeling under 49 CFR 173.309. The "Non-Flammable Gas" label would not be added, except if the cylinder is offered for shipment by air.

MARINE POLLUTANT: Not applicable.

THIS MATERIAL IS HAZARDOUS AS DEFINED BY TRANSPORT CANADA "TRANSPORTATION OF DANGEROUS GOODS" REGULATIONS. See above information.

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15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: Carbon Dioxide is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

SARA Threshold Planning Quantity: Not applicable.

TSCA INVENTORY STATUS: Carbon Dioxide is listed on the TSCA Inventory.

CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

OTHER FEDERAL REGULATIONS: Not applicable.

STATE REGULATORY INFORMATION: Chemicals in this product are covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: Carbon Dioxide.	Massachusetts - Substance List: Carbon Dioxide.	Pennsylvania - Hazardous Substance List: Carbon Dioxide.
California - Permissible Exposure Limits for Chemical Contaminants: Carbon Dioxide.	Minnesota - List of Hazardous Substances: Carbon Dioxide.	Rhode Island - Hazardous Substance List: Carbon Dioxide.
Florida - Substance List: Carbon Dioxide.	Missouri - Employer Information/Toxic Substance List: Carbon Dioxide.	Texas - Hazardous Substance List: None.
Illinois - Toxic Substance List: Carbon Dioxide.	New Jersey - Right to Know Hazardous Substance List: Carbon Dioxide.	West Virginia - Hazardous Substance List: Carbon Dioxide.
Kansas - Section 302/313 List: None.	North Dakota - List of Hazardous Chemicals, Reportable Quantities: None.	Wisconsin - Toxic and Hazardous Substances: Carbon Dioxide.

CALIFORNIA PROPOSITION 65: Carbon dioxide is not listed on the California Proposition 65 lists.

LABELING (Precautionary Statements): WARNING! Liquefied gas under pressure. May cause frostbite burns. Exposure may cause headaches, dizziness, eye irritation. Use only in well-ventilated area. Store in a cool, dry location.

TARGET ORGANS: Respiratory system, skin, eyes.

WHMIS SYMBOLS:

16. OTHER INFORMATION

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
 9163 Chesapeake Drive, San Diego, CA 92123-1002
 619/565-0302

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. AMEREX Corporation assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, AMEREX Corporation assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

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DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on an MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour **Time Weighted Average (TWA)**, the 15-minute **Short Term Exposure Limit**, and the instantaneous Ceiling Level. Skin adsorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - this exposure value means exactly the same as a TLV, except that it is enforceable by OSHA.

The IDLH - Immediately Dangerous to Life and Health level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury.

The DFG - MAK is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD50** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC50** - Lethal Concentration (gases) which kills 50% of the exposed animals; ppm concentration expressed in parts of material per million parts of air or water; **mg/m3** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDL0**, the lowest dose to cause a symptom; **TDo**, **LDLo**, and **LDo**, the lowest dose to cause death.

REGULATORY INFORMATION

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency.

Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA). NIOSH issues exposure guidelines called Recommended Exposure Levels (RELs). When no exposure guidelines are established, an entry of NE is made for reference.

FLAMMABILITY LIMITS IN AIR: Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). **LEL** - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. **UEL** - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazard Information System. **DOT** and **CTC** are the U.S. Department of Transportation and the Canadian Transportation Commission, respectively. These are: **Superfund Amendments and Reauthorization Act (SARA)**; the **Toxic Substances Control Act (TSCA)**; Marine Pollutant status according to the DOT; California's Safe Drinking Water Act (**Proposition 65**); the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund)**; and various state regulations. This section also includes information on the precautionary warnings which appear on the materials package label.

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FIRE EXTINGUISHER - Cautions and Warnings

Fire extinguishers are designed and produced for the specific purpose of providing a safe and efficient safety tool to be used only in the fighting of fires. Improper or careless use may cause severe bodily injury and/or property damage.

Contents are under pressure which is necessary to deliver the contained extinguishing agent to the fire source. Please take note of the following safety information:

- Contents are under pressure. Do not puncture, incinerate, or discharge into another person's face.
- Do not store at high temperatures above 120 degrees F. or 49 degrees C.
- Keep away from small children.
- Do not use if the extinguisher appears to be damaged or corroded.
- Avoid inhaling the extinguishing agent. Avoid inhaling smoke and fumes - all fires release toxic substances that are harmful. DO NOT remain in a closed area after use; evacuate the area immediately and ventilate thoroughly before re-entering.
- Although extinguishing agents are non-toxic when used properly, contact with them may cause irritation to eyes, nose, throat, and other allergic symptoms.

Refer to specific extinguishing agent material safety data sheet for additional information.

AVOID INHALING SMOKE AND FUMES; ALL FIRES RELEASE TOXIC SUBSTANCES THAT ARE HARMFUL. DO NOT REMAIN IN CLOSED AREA AFTER USE. VENTILATE CLOSED AREAS BEFORE RETURNING.