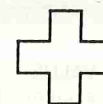


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L-4715-B
March 1988

MATERIAL SAFETY DATA SHEET

An explanation of the terms used herein may be found in OSHA 29 CFR 1910.1200, available from OSHA regional or area offices.
(Similar to U.S. Department of Labor Form OMB No. 1218-0072. and generally accepted in Canada for information purposes)
Do Not Duplicate This Form. Request an Original.



I. PRODUCT IDENTIFICATION

PRODUCT	25% Carbon Dioxide - 75% Argon Mixture		
CHEMICAL NAME	Carbon Dioxide - Argon mixture	SYNONYMS	C-25 Shielding gas
FORMULA	Mixture of CO ₂ and Ar	CHEMICAL FAMILY	Not Applicable
		MOLECULAR WEIGHT	Not Applicable

TRADE NAME C-25 Shielding Gas (This product is intended for electric welding use.)

II. HAZARDOUS INGREDIENTS

This section covers the materials from which this product is manufactured. The fumes and gases produced during cutting with the normal use of this product are covered by Section VI. The term "hazardous" should be interpreted as a term required and defined in OSHA 29 CFR 1910.1200 and does not necessarily imply the existence of any hazard.

MATERIAL (CAS NO.)	Vol (%)	1987-1988 ACGIH TLV-TWA (OSHA-PEL)	
Argon (7440-37-1)	75	Simple asphyxiant	(None currently established)
Carbon Dioxide (124-38-9)	25	5000 ppm	(5000 ppm)

III. PHYSICAL DATA

BOILING POINT, 760 mm. Hg	Not Applicable	FREEZING POINT	Not Applicable
SPECIFIC GRAVITY (H ₂ O = 1)	Gas	VAPOR PRESSURE AT 20°C.	Gas
VAPOR DENSITY (air = 1)	1.42	SOLUBILITY IN WATER, % by wt.	Negligible
PERCENT VOLATILES BY VOLUME	100	EVAPORATION RATE (Butyl Acetate = 1)	Not Applicable

APPEARANCE AND ODOR Colorless, odorless gas at normal temperature and pressure.

EMERGENCY PHONE NUMBER

IN CASE OF EMERGENCIES involving this material, further information is available at all times:
In the USA 1-800-UCC-HELP (1-800-822-4357) In Canada 514-640-6400
For routine information contact your local supplier

Union Carbide Industrial Gases Inc. requests the users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

UNION CARBIDE INDUSTRIAL GASES INC.
LINDE DIVISION

L-4715-B

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

The ACGIH 1987-88 recommended limit for welding fume, not otherwise classified (NOC), is 5 mg/m³. The TLV-TWA's should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations. See Section VI for specific fume constituents which may modify this TLV-TWA. Carbon dioxide TLV 5000ppm, argon is classified as a simple asphyxiant (ACGIH 1987-88).

EFFECTS OF SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING — This product is a gas at normal temperatures and pressures.

SKIN ABSORPTION — No evidence of adverse effects from available information.

INHALATION — Asphyxiant. Moderate concentrations may cause headache, drowsiness, dizziness, stinging of the nose and throat, excitation, rapid breathing, increased heart rate, excess salivation, vomiting, and unconsciousness.

SKIN CONTACT — No evidence of adverse effects from available information.

EYE CONTACT — No evidence of adverse effects from available information.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No evidence of adverse effects from available information.

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

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: A knowledge of the available toxicology information and of the physical and chemical properties of the material suggest that overexposure is unlikely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: One published study has reported an increased incidence of cardiac malformations in offspring of female rats exposed for a single 24 hour interval to 6% carbon dioxide. Although the study suffers from design and reporting flaws, the results must still be considered significant. There is no information available to confirm or refute the effects reported. The relevance of this information to humans is unknown.

EMERGENCY AND FIRST-AID PROCEDURES:

SWALLOWING — This product is a gas at normal temperatures and pressures.

SKIN CONTACT — No emergency care anticipated.

INHALATION — Remove to fresh air. Give artificial respiration if not breathing. Qualified personnel may give oxygen if breathing is difficult. Obtain medical attention.

EYE CONTACT — Flush with water. Obtain medical attention if discomfort persists.

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

WORKING WITH WELDING AND CUTTING MAY CREATE ADDITIONAL HEALTH HAZARDS

FUMES AND GASES can be dangerous to your health and may cause serious lung disease.*

Keep your head out of the fumes. Do not breathe fumes and gases caused by the process. Use enough ventilation, local exhaust, or both to keep fumes and gases from your breathing zone and the general area. The type and amount of fumes and gases depend on the equipment and supplies used. Possibly dangerous materials may be found in fluxes, coatings, gases, metals etc. Get a Material Safety Data Sheet (MSDS) for every material used. Air samples can be used to find out what respiratory protection is needed.

Short term overexposure to fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat, or eyes.

*NOTES TO PHYSICIAN:

Acute — *Gases, fumes, and dusts may cause irritation to the eyes, lungs, nose, and throat. Some toxic gases associated with welding and related processes may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, difficulty breathing, frequent coughing, or chest pains.*

Chronic — *Protracted inhalation of air contaminants may lead to their accumulation in the lungs, a condition which may be seen as dense areas on chest X-rays. The severity of change is proportional to the length of exposure. The changes seen are not necessarily associated with symptoms or signs of reduced lung function or disease. In addition, the changes on X-rays may be caused by non-work related factors such as smoking, etc.*

A detailed description of the Health Hazards and their consequences may be found in Linde's free publication "Precautions and Safe Practices for Electric Welding and Cutting," L52-529. You may obtain copies from your local supplier, or by writing to Union Carbide Corporation, Linde Division, Communications Department, 39 Old Ridgebury Road, Danbury, Connecticut, 06817-0001.

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.

V. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method)	Not Applicable		AUTOIGNITION TEMPERATURE	Not Applicable
FLAMMABLE LIMITS IN AIR, % by volume	LOWER	Not Applicable	UPPER	Not Applicable

EXTINGUISHING MEDIA

Gas mixture cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES

Evacuate all personnel from danger area. Immediately cool cylinders with water spray from maximum distance until cool then move containers away from fire area if without risk. Shut off leak if without risk.

Arcs and sparks can ignite combustibles. Refer to American National Standard Z49.1 "Safety in Welding and Cutting" for fire prevention information during the use of welding and allied procedures.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Gas mixture cannot catch fire. Container may rupture due to heat of fire. No part of a container should be subjected to a temperature higher than 52°C (approximately 125°F). Most containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature.

VI. REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID High pressure gas. Close valve when not in use and when empty. Use with equipment rated to adequately withstand pressures to be encountered. Do not strike arc on cylinder. Do not ground cylinder. See Section IX.
UNSTABLE	STABLE	
	X	

INCOMPATIBILITY (materials to avoid)

Titanium burns in Carbon Dioxide above 550°C.
Magnesium burns in Carbon Dioxide above 775°C.

HAZARDOUS DECOMPOSITION PRODUCTS

The arc process may form gaseous reaction products such as Carbon Monoxide and Carbon Dioxide. Ozone and Nitrogen Oxides may be formed by the radiation from the arc. See Section IV. Other decomposition products of normal operation originate from the volatilization, reaction or oxidation of the material being worked.

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID None currently known.
May Occur	Will not Occur	
	X	

VII. SPILL OR LEAK PROCEDURES**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED**

This gas mixture is an asphyxiant. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off cylinder if without risk. Ventilate area of leak or move cylinder to well-ventilated area. Test area, especially confined areas, for sufficient oxygen content prior to permitting re-entry of personnel.

WASTE DISPOSAL METHOD: Slowly release into atmosphere. Discard any product, residue, disposable container or liner in an environmentally acceptable manner in full compliance with Federal, State and local regulations.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type) — Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select as per OSHA29 CFR1910.134.

VENTILATION	LOCAL EXHAUST — Use enough ventilation, local exhaust or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the worker to keep his head out of the fumes.	
	MECHANICAL (general)	ALWAYS WORK WITH ENOUGH VENTILATION
	SPECIAL — Avoid using electric arcs in the presence of chlorinated hydrocarbon vapors — Highly toxic phosgene may be produced. Avoid arc operations on parts with phosphate residues (anti-rust, cleaning preparations) — Highly toxic phosphine may be produced.	
	OTHER Depends on specific use conditions, and location. Use adequate ventilation or personal respiratory protection. See Section IX and OSHA29 CFR1910.252.	

PROTECTIVE GLOVES

Welding gloves recommended

EYE PROTECTION — Wear a helmet or use a face shield with a filter lens selected as per ANSI Z49.1. Provide protective screens and flash goggles, if necessary, to protect others. Select as per OSHA29 CFR1910.133.

OTHER PROTECTIVE EQUIPMENT — As needed, wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the worker not to touch live electrical parts.

IX. SPECIAL PRECAUTIONS

Fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being worked, the process, procedure and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being worked (such as paint, plating, or galvanizing), the number of workers and the volume of the work area, the quality and amount of ventilation, the position of the worker's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample from inside the worker's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1, available from the American Welding Society, 550 N.W. Le Jeune Rd., Miami, FL 33135.

Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1, "Safety In Welding And Cutting" published by the American Welding Society and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more details. For further safety and health information refer to Linde's free safety booklet, "Precautions and Safe Practices for Electric Welding and Cutting," L52-529.

OTHER HANDLING AND STORAGE CONDITIONS

Arcs and sparks during use could be the source of ignition of combustible materials. Prevent fires.

Refer to NFPA 51B "Cutting and Welding Processes." High pressure gas mixture. Use piping and equipment adequately designed to withstand pressures to be encountered. Gas can cause rapid suffocation due to oxygen deficiency. Store and use with adequate ventilation. Close valve when not in use and when empty. Do not strike arc on cylinder. The defect produced by an arc burn could lead to cylinder rupture. Do not ground cylinder. Never work on a pressurized system.

The opinions expressed herein are those of qualified experts within Union Carbide Industrial Gases Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of Union Carbide Industrial Gases Inc. it is the user's obligation to determine the conditions of safe use of the product.

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