IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: The ACGIH 1992-1993 recommended limit for welding fume, not otherwise classified (NOC), is 5 mg/m^3. TLV-TWAs 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 5000 ppm, argon and helium are classified as simple asphyxiants (ACGIH 92-93).

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING—This product is a gas at normal temperature and pressure.

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, 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: A single study has shown an increase in heart defects in rats exposed to 6% carbon dioxide in air for 24 hours at different times during gestation. There is no evidence that carbon dioxide is teratogenic in humans.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING—This product is a gas at normal temperature and pressure.

SKIN—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 Praxair's free publication, L-52-529, "Precautions and Safe Practices for Electric Welding and Cutting." You may obtain copies from your local supplier or by writing to Praxair, Inc., Technical Communications, PO Box 44, Tonawanda, NY 14151-0044.

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 your produc

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): Use air-purifying or air-supplied respirators as appropriate, where the local and/or the general exhaust ventilation is not adequate to keep worker's exposure below the applicable TLVs during welding operations with this product. Air-supplied respirator is required while working in confined spaces. The respiratory protection use must conform with OSHA rules as specified in 29 CFR 1910.134.

VENTILATION	**LOCAL EXHAUST**—Use local exhaust system, if necessary, to maintain the concentration of hazardous fumes and gases below the applicable TLVs in the worker's breathing zone.
	MECHANICAL (general)—Under certain conditions, general exhaust ventilation may be acceptable provided that it is adequate to maintain the concentration of hazardous fumes and gases below the applicable TLVs in the worker's breathing zone.
	SPECIAL—None.
	OTHER—None.

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 in accordance with OSHA 29 CFR 1910.133.

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). Train workers to keep their head out of the fumes. 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.

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 Road, 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 (29 CFR 1910), US Government Printing Office, Washington, DC 20402 for more details. For further safety and health information refer to Praxair's free safety booklet, L-52-529, "Precautions and Safe Practices for Electric Welding and Cutting."

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 or allow to become part of electrical circuit. Never work on a pressurized system.

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