

Product: Stargold™ C-25
Shielding Gas Mixture

Form No.: P-4715-E

Date: October 1997

Praxair™ Material Safety Data Sheet

#12

1. Chemical Product and Company Identification

Product Name: Stargold™ C-25 Shielding Gas Mixture (MSDS No. P-4715-E)	Trade Name: Stargold™ C-25 Shielding Gas Mixture
Chemical Name: Not applicable	Synonyms: 25% CO ₂ -75% Ar mixture
Formula: Mixture of CO ₂ and Ar	Chemical Family: Not applicable
Telephone: Emergencies: 1-800-645-4633* CHEMTREC 1-800-424-9300* Routine: 1-800-PRAXAIR	Company Name: Praxair, Inc. 39 Old Ridgebury Road Danbury CT 06810-5113

**Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).*

2. Composition / Information on Ingredients

For custom mixtures of this product request a Material Safety Data Sheet for each component. See Section 16 for important information about mixtures.

INGREDIENT NAME	CAS NUMBER	PERCENTAGE	OSHA PEL	ACGIH TLV
Carbon Dioxide	124-38-9	25%	5,000 ppm	5,000 ppm, 30,000 ppm (15 min) STEL Simple Asphyxiant
Argon	7440-37-1	75%	None currently established	

3. Hazards Identification

EMERGENCY OVERVIEW

CAUTION! High-pressure gas.
Can cause rapid suffocation.
May cause dizziness and drowsiness.
Can increase respiration and heart rate.
May cause nervous system damage.
Self-contained breathing apparatus may be required by rescue workers.
Odor: None

THRESHOLD LIMIT VALUE: ACGIH (1997) recommends a TLV-TWA of 5 mg/m³ for welding fumes not otherwise classified (NOC) that may be generated during welding with this product. TLV-TWAs

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should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations. See section 2 for component TLVs, section 16 for more information on welding hazards.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION—Asphyxiant. Effects are due to lack of oxygen. The carbon dioxide component is also physiologically active, affecting circulation and breathing. Moderate concentrations may cause headache, drowsiness, dizziness, stinging of the nose and throat, excitation, rapid breathing, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill.

SKIN CONTACT—No harm expected.

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

EYE CONTACT—No harm expected.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No harm expected.

OTHER EFFECTS OF OVEREXPOSURE: Possible damage to retinal ganglion cells and central nervous system.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: The toxicology and the physical and chemical properties of the mixture components 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.

CARCINOGENICITY: None of the components is listed by NTP, OSHA, and IARC.

4. First Aid Measures

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: No emergency care anticipated.

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

EYE CONTACT: Flush with water. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Get 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 of the patient.*

5. Fire Fighting Measures

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

EXTINGUISHING MEDIA: This mixture cannot catch fire. Use media appropriate for surrounding fire.

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SPECIAL FIRE FIGHTING PROCEDURES:

CAUTION! High-pressure gas mixture. Asphyxiant—will not support life. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool, then move them away from fire area if without risk. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Heat of fire can build pressure in cylinder and cause it to rupture. No part of cylinder should be subjected to a temperature higher than 125°F (52°C). Cylinders containing this mixture are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.)

HAZARDOUS COMBUSTION PRODUCTS: None known.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

CAUTION! High-pressure gas mixture. This mixture is an asphyxiant. Lack of oxygen can kill. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off flow if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

WASTE DISPOSAL METHOD: Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

PRECAUTIONS TO BE TAKEN IN HANDLING: Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier. For other precautions in using this mixture, see section 16.

For additional information on storage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, "Safe Handling of Compressed Gases in Containers," available from the CGA. Refer to section 16 for the address and phone number along with a list of other available publications.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST—Preferred. Use a local exhaust system, if necessary, to prevent oxygen deficiency and keep hazardous fumes and gases below applicable TLVs in the worker's breathing zone.

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MECHANICAL (general)—General exhaust ventilation may be acceptable if it can maintain an adequate supply of air and keep hazardous fumes and gases below the applicable TLVs in the worker's breathing zone.

SPECIAL—None.

OTHER—None.

RESPIRATORY PROTECTION: Use air-purifying or air-supplied respirators, as appropriate, where local or general exhaust ventilation is inadequate. Adequate ventilation must keep worker exposure below applicable TLVs for fumes, gases and other by-products of welding with this mixture. See sections 3, 10, and 16 for details. An air-supplied respirator must be used in confined spaces. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134.

SKIN PROTECTION: Wear work gloves when handling cylinders; welding gloves for welding.

EYE PROTECTION: Wear safety glasses when handling cylinders. For welding, see section 16.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. For welding, see section 16. Regardless of protective equipment, never touch live electrical parts.

9. Physical and Chemical Properties

MOLECULAR WEIGHT: Not applicable	EXPANSION RATIO: Not applicable
SPECIFIC GRAVITY (air=1): At 70°F (21.1°C) and 1 atm: 1.42 (calculated)	SOLUBILITY IN WATER: % by wt., vol/vol at 32°F (0°C): Negligible
GAS DENSITY: At 70°F (21.1°C) and 1 atm: Not applicable	VAPOR PRESSURE: AT 68°F (20°C): Not applicable
PERCENT VOLATILES BY VOLUME: 100	EVAPORATION RATE: Gas, not applicable
BOILING POINT (1 atm): Not applicable	pH: Not applicable
FREEZING POINT (1 atm): Not applicable	

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

10. Stability and Reactivity

STABILITY:	Unstable		Stable	X
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INCOMPATIBILITY (materials to avoid): Alkali metals, alkaline earth metals, metal acetylides, chromium, titanium above 1022°F (550°C), uranium above 1382°F (750°C), magnesium above 1427°F (775°C).

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

HAZARDOUS POLYMERIZATION:	May Occur		Will Not Occur	X
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CONDITIONS TO AVOID: None known.

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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:

EFFECT	CONCENTRATION
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, increased 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%

12. Ecological Information

This mixture not contain any Class I or Class II ozone-depleting chemicals. None of the mixture components is listed as a marine pollutant by DOT.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Keep waste from contaminating surrounding environment. Keep personnel away. Do not dispose of unused quantities. Return cylinder to supplier.

14. Transport Information

DOT/IMO SHIPPING NAME: Compressed gas, n.o.s. (argon, carbon dioxide)	HAZARD CLASS: 2.2
IDENTIFICATION NUMBER: UN 1956	PRODUCT RQ: None
SHIPPING LABEL(s): NONFLAMMABLE GAS	PLACARD (When required): NONFLAMMABLE GAS

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

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15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (Environmental Protection Agency)

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:

- **SECTIONS 302/304:** Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of extremely hazardous substances (40 CFR Part 355):

Threshold Planning Quantity (TPQ): None.

Extremely Hazardous Substances (40 CFR 355): None.

- **SECTIONS 311/312:** Require submission of Material Safety Data Sheets (MSDSs) and chemical inventory reporting with identification of EPA hazard categories. The hazard categories for this products are as follows:

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.

This mixture does not require reporting under Section 313.

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

None of the components is listed as a regulated substance.

TSCA: Toxic Substances Control Act: The mixture components are 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.

None of the components is listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: This product is not listed by California under the Safe Drinking Water Toxic Enforcement Act of 1986 (Proposition 65).

PENNSYLVANIA: This product is subject to the Pennsylvania Worker and Community Right-To-Know Act (35 P.S. Sections 7301-7320).

16. Other Information

ADDITIONAL SAFETY AND HEALTH HAZARDS: Using this mixture in welding and cutting may create additional hazards:

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

- Keep your head out of fumes. Do not breathe fumes and gases. Use enough ventilation, local exhaust, or both to keep fumes and gases from your breathing zone and the general area. Short term overexposure to fumes may result in dizziness, nausea, dryness or irritation of nose, throat, and eyes or other similar discomfort.

Fumes and gases cannot be classified simply. The amount and type depend on the metal being worked and the process, procedure, equipment, and supplies used. Possible dangerous materials may be found in fluxes, electrodes, and other materials. Get a Material Safety Data Sheet (MSDS) for every material you use.

Contaminants in the air may add to the hazard of fumes and gases. One such contaminant, chlorinated hydrocarbon vapors from cleaning and degreasing activities, poses a special risk.

- Do not use electric arcs in the presence of chlorinated hydrocarbon vapors—highly toxic phosgene may be produced.

Metal coatings such as paint, plating, or galvanizing may generate harmful fumes when heated. Residues from cleaning materials may also be harmful.

- Avoid arc operations on parts with phosphate residues (anti-rust, cleaning preparations)—highly toxic phosphine may be produced.

To find the quantity and content of fumes and gases, you can take air samples. By analyzing these samples, you can find out what respiratory protection you need. One recommended sampling method is to take air from inside the worker's helmet or from the worker's breathing zone. See ANSI/AWSF1.1, available from the American Welding Society, 550 N.W. Le Jeune Rd., Miami, FL 33126.

For other safe practices information and a more detailed description of the health hazards of welding and their consequences, see your welding products supplier.

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 that 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.

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PROTECTIVE CLOTHING AND EQUIPMENT FOR WELDING OPERATIONS:

PROTECTIVE GLOVES: Wear welding gloves.

EYE PROTECTION: Wear a helmet or use a face shield with a filter lens. Select lens per ANSI Z49.1. Provide protective screens and flash goggles if needed to protect others; select per OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Wear hand, head, and body protection. (See ANSI Z49.1.) Worn as needed, these help prevent injury from radiation, sparks, and electrical shock. Minimum protection includes welder's gloves and a face shield. For added protection consider arm protectors, aprons, hats, shoulder protection, and dark, substantial clothing. Regardless of protective equipment, never touch live electrical parts.

For other safe practices information and a more detailed description of the health hazards of welding and their consequences, ask your welding products supplier for a copy of Praxair's free safety booklet, P-52-529, *Precautions and Safe Practices for Electric Welding and Cutting*.

High-pressure gas. Use piping and equipment adequately designed to withstand pressures to be encountered. To prevent reverse flow, use a check valve or other protective device in any line or piping from the cylinder. Never work on a pressurized system. *Gas can cause rapid suffocation* due to oxygen deficiency. Store and use with adequate ventilation. Close valve after each use; keep closed even when empty. *Never strike an arc on a compressed gas cylinder.* The defect produced by an arc burn could lead to cylinder rupture. *Never ground a compressed gas cylinder or allow it to become part of an electrical circuit.*

Be sure to read and understand all labels and other instructions supplied with all containers of this product.

MIXTURES: When you mix two or more gases or liquefied gases, you can 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 evaluate the end product.

HAZARD RATING SYSTEMS:

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: 0-3000 psig CGA-580
PIN-INDEXED YOKE: 0-3000 psig Not applicable
ULTRA-HIGH-INTEGRITY CONNECTION: Not applicable

Use the proper CGA connections. **DO NOT USE ADAPTERS.** For additional information, see CGA pamphlets V-1 and V-7 listed below.

Ask your supplier about free Praxair safety literature as referenced on the label for this product; you may also obtain copies by calling 1-800-PRAXAIR. Further information about This mixture can be found in the

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The opinions expressed herein are those of qualified experts within Praxair, 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 the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

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