

**MATERIAL SAFETY DATA SHEET**

**SECTION 1. PRODUCT IDENTIFICATION**

**PRODUCT NAME:** 3-25% Carbon Dioxide / 75-97% Argon  
**TRADE NAME:** Shielding Gas Mixture (for welding processes)  
**FORMULA:** CO<sub>2</sub> / Ar  
**MANUFACTURER:** Air Products and Chemicals, Inc.  
 7201 Hamilton Boulevard  
 Allentown, PA 18195-1501  
**PRODUCT INFORMATION:** 1-800-752-1597  
**MSDS NUMBER:** 1211 **REVISION:** 0  
**REVISION DATE:** February 2000 **REVIEW DATE:** February 2000

**SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS**

COMPONENT	%	CAS NUMBER	OSHA EXPOSURE LIMITS	ACGIH EXPOSURE LIMITS
Argon	75-97	7440-37-1	None	Simple Asphyxiant
Carbon Dioxide	3-25	124-38-9	TWA = 5,000 ppm	TWA = 5,000 ppm

**SECTION 3. HAZARD IDENTIFICATION**

**EMERGENCY OVERVIEW**

Shielding Gas Mixture is a nontoxic, odorless, colorless, nonflammable gas packaged in cylinders under high pressure. It can cause rapid suffocation when concentrations are sufficient to reduce oxygen levels below 19.5%. Self-Contained Breathing Apparatus (SCBA) may be required. This mixture is heavier than air and may collect in low areas.

**EMERGENCY TELEPHONE NUMBERS**

(800) 523-9374 Continental U.S., Canada and Puerto Rico  
 (610) 481-7711 other locations

**POTENTIAL HEALTH EFFECTS:**

**INHALATION:** Shielding Gas Mixture is nontoxic, but can reduce the amount of oxygen in the air necessary to support life. Exposure to oxygen-deficient atmospheres (less than 19.5%) may produce dizziness, nausea, vomiting, loss of consciousness, and death. At very low oxygen concentrations (less than 12%) unconsciousness and death may occur without warning.

**EYE CONTACT:** No adverse effect.

**SKIN CONTACT:** No adverse effect.

**POTENTIAL HEALTH EFFECTS OF REPEATED EXPOSURE:****ROUTE OF ENTRY:** Inhalation**TARGET ORGANS:** None**SYMPTOMS:** None**TOXICOLOGICAL PROPERTIES:**

Shielding Gas Mixture is nontoxic. The major hazard of exposure is the exclusion of an adequate supply of oxygen to the body necessary to support life.

**CARCINOGENIC POTENTIAL:** The components that make up Shielding Gas Mixture are not listed as a carcinogen or potential carcinogen by NPT, IARC, or OSHA Subpart Z.

**SECTION 4. FIRST AID**

**INHALATION:** Remove person to fresh air. If not breathing, administer artificial respiration. If breathing is difficult, administer oxygen. Obtain prompt medical attention. Quick removal from contaminated area is most important.

**EYE CONTACT:** No treatment necessary.

**SKIN CONTACT:** No treatment necessary.

**SECTION 5. FIRE AND EXPLOSION**

**FLASH POINT:**  
Not Applicable

**AUTOIGNITION:**  
Nonflammable

**FLAMMABLE LIMITS:**  
Nonflammable

**EXTINGUISHING MEDIA:** Not applicable

**HAZARDOUS COMBUSTION PRODUCTS:** None

**FIRE FIGHTING PROCEDURES:** Cool cylinders with water spray. If possible, without risk, move cylinders away from fire area.

**UNUSUAL HAZARDS:** Upon exposure to intense heat or flame cylinder will 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.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

Evacuate all personnel from affected area. Increase ventilation to release area and monitor oxygen level. Use appropriate protective equipment (SCBA). If leak is from cylinder or cylinder valve, contact your supplier. If leak is in user's system, close cylinder valve and vent pressure before attempting repairs.

**SECTION 7. STORAGE AND HANDLING**

**STORAGE:** Cylinders should be stored upright in a well-ventilated, secure area, protected from the weather. Storage area temperatures should not exceed 125 °F (52 °C) and area should be free of combustible materials. Storage should be away from heavily traveled areas and emergency exits. Avoid areas where salt or other corrosive materials are present. Valve protection caps and valve outlet seals should remain on cylinders not connected for use. Separate full from empty cylinders. Avoid excessive inventory and storage time. Use a first-in first-out system. Keep good inventory records.

**HANDLING:** Do not drag, roll, or slide cylinder. Use a suitable handtruck designed for cylinder movement. Never attempt to lift a cylinder by its cap. Secure cylinders at all times while in use. Use a pressure reducing regulator or separate control valve to safely discharge gas from cylinder. Use a check valve to prevent reverse flow into cylinder. Do not overheat cylinder to increase pressure or discharge rate. 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.

Components in this mixture are compatible with all common materials of construction. Pressure requirements should be considered when selecting materials and designing systems.

**SPECIAL REQUIREMENTS:** Always store and handle compressed gases in accordance with Compressed Gas Association, Inc. (tel. 703-412-0900) pamphlet CGA P-1, *Safe Handling of Compressed Gases in Containers*. Local regulations may require specific equipment for storage or use.

### SECTION 8. PERSONAL PROTECTION / EXPOSURE CONTROL

**ENGINEERING CONTROLS:** Provide good ventilation and/or local exhaust to prevent accumulation of high concentrations of gas. Monitor oxygen levels in work area.

**RESPIRATORY PROTECTION:**

**EMERGENCY:** Use SCBA or positive pressure air line with mask and escape pack in areas where oxygen concentration is < 19.5%. Air purifying respirators will not provide protection.

**SKIN PROTECTION:** Leather work gloves for handling cylinders.

**EYE PROTECTION:** Safety glasses.

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

**APPEARANCE:** Colorless gas

	ARGON	CARBON DIOXIDE
<b>BOILING POINT (1 atm)</b>	-302.2 °F	-109.3 °F
<b>FREEZING POINT</b>	-308.79 °F	-69.97 °F
<b>GAS DENSITY at 70 °F (1 atm)</b>	0.103 lb/ft <sup>3</sup>	0.1144 lb/ft <sup>3</sup>
<b>SPECIFIC GRAVITY (air = 1)</b>	1.38	1.52
<b>SPECIFIC VOLUME at 70 °F (1 atm)</b>	9.71 ft <sup>3</sup> /lb	8.74 ft <sup>3</sup> /lb
<b>MOLECULAR WEIGHT</b>	39.95	44.01

### SECTION 10. REACTIVITY / STABILITY

**CHEMICAL STABILITY:** Stable

**CONDITIONS TO AVOID:** None

**INCOMPATIBILITY:** None

**HAZARDOUS DECOMPOSITION PRODUCTS:** None

**HAZARDOUS POLYMERIZATION:** Will not occur.

### SECTION 11. TOXICOLOGICAL INFORMATION

Shielding Gas Mixture is nontoxic. Components in this mixture are simple asphyxiants.

### SECTION 12. ECOLOGICAL INFORMATION

Components in this mixture are found in the atmosphere. No adverse ecological effects are expected. This mixture does not contain any Class I or Class II ozone depleting chemicals. Components in this mixture are not listed as a marine pollutant by DOT (49 CFR 171).

### SECTION 13. DISPOSAL

**UNUSED PRODUCT / EMPTY CONTAINER:** Return container and unused product to supplier. Do not attempt to dispose of residual or unused quantities.

**DISPOSAL:** For emergency disposal, secure the cylinder and slowly discharge gas to the atmosphere in a well ventilated area or outdoors.

### SECTION 14. TRANSPORT INFORMATION

**DOT HAZARD CLASS:** 2.2

**DOT SHIPPING LABEL:** Nonflammable Gas

**DOT SHIPPING NAME:** Compressed Gas, n.o.s. (argon, carbon dioxide)

**IDENTIFICATION NUMBER:** UN 1956

**DOT PLACARD (When required):** Nonflammable Gas

**REPORTABLE QUANTITY (RQ):** None

**SPECIAL SHIPPING INFORMATION:** Cylinders should be transported in a secure upright position in a well ventilated truck. Never transport in passenger compartment of a vehicle.

Compressed gas cylinders shall not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner's written consent is a violation of federal law.

**NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK (NAERG):** # 126

### SECTION 15. REGULATORY INFORMATION

#### U.S. FEDERAL REGULATIONS:

#### ENVIRONMENTAL PROTECTION AGENCY (EPA)

**CERCLA:** Comprehensive Environmental Response, Compensation, and Liability Act of 1980 requires notification to the National Response Center of a release of quantities of hazardous substances equal to or greater than the reportable quantities (RQs) in 40 CFR 302.4.

CERCLA Reportable Quantity: None

**SARA TITLE III:** Superfund Amendment and Reauthorization Act of 1986

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

Components in this mixture are not listed as an extremely hazardous substance.

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. The hazard classes for this product are:

IMMEDIATE HEALTH:	No	PRESSURE:	Yes
DELAYED HEALTH:	No	REACTIVITY:	No
		FLAMMABLE:	No

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

This mixture does not require reporting under Section 313.

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**TSCA - TOXIC SUBSTANCE CONTROL ACT:**

Components in this mixture are listed on the TSCA inventory.

**40 CFR PART 68: Risk Management for Chemical Accident Release Prevention.** 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.

Components in this mixture are not covered under this regulation.

**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.

Components in this mixture are not listed in Appendix A as highly hazardous chemicals.

**STATE REGULATIONS**

**CALIFORNIA:**

Proposition 65: This product does NOT contain any listed substances which the State of California requires warning under this statute.

SCAQMD Rule: VOC = Not Applicable

**SECTION 16. OTHER INFORMATION**

**HAZARD RATINGS:**

**NFPA RATINGS:**

HEALTH: 0  
FLAMMABILITY: 0  
REACTIVITY: 0  
SPECIAL: SA\*

**HMIS RATINGS:**

HEALTH: 0  
FLAMMABILITY: 0  
REACTIVITY: 0

\*Compressed Gas Association recommendation to designate simple asphyxiant.

**HAZARDOUS INGREDIENTS  
MATERIAL SAFETY DATA SHEET**

3:500-01

FILLER METALS AND WELDING RODS

APPROVED BY U.S. DEPARTMENT OF LABOR "ESSENTIALLY SIMILAR" TO FORM LSB-005-4

<b>SECTION I</b>	
<b>MANUFACTURER'S NAME:</b> OYTGÖLS BRUKS AKTIEBOLAG	<b>REV:</b> September 15, 1989
<b>ADDRESS (Number, Street, City, State and ZIP code):</b> 8-610 11 GRYTGÖL	<b>PHONE NO:</b> +46 122 43040
<b>TRADE NAME:</b> WELD MARK	<b>SWEDEN</b>
<b>AWB CLASSIFICATION:</b> A5. 1B Class ER 70S-5	

**SECTION II HAZARDOUS INGREDIENTS**

COVERING OR FLUX	WT. %	TLV (UNITS)	OTHER	WT.%	TLV (1) (UNITS)
			Iron	97,5	5 mg/m <sup>3</sup> 2)
			Manganese	1,40	1 mg/m <sup>3</sup> 2)
				1,60	
			Silicon	0,80	10 mg/m <sup>3</sup> 3)
				1,00	
			Copper	0,10	0,1 mg/m <sup>3</sup> 2)
			Copper	0,10	1,0 mg/m <sup>3</sup> 4)

- 1) OSHA-American Conference of Governmental Industrial Hygienists 1989-90 ed.
- 2) As oxide fume
- 3) Nuisance 10 mg/m<sup>3</sup> of total dust
- 4) As dust

**SECTION III PHYSICAL DATA**

Not Applicable

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

Welding arc and sparks can ignite combustible products.

**SECTION V HEALTH HAZARD DATA** September 15, 1989

**EFFECTS OF OVEREXPOSURE:** Short term overexposure to welding fumes may result in dizziness, nausea or dryness or irritation of nose, throat or eyes.

**EMERGENCY AND FIRST AID PROCEDURES:** Remove to fresh air. Obtain medical attention.

**SECTION VI REACTIVITY DATA**

<b>STABILITY</b>	<b>UNSTABLE</b>	X	<b>CONDITIONS TO AVOID</b>
	<b>STABLE</b>		
<b>INCOMPATIBILITY (Material to avoid)</b>			
<b>HAZARDOUS DECOMPOSITION PRODUCTS:</b>			
<b>HAZARDOUS POLYMERIZATION</b>	None		

**SECTION VII SPILL OR LEAK PROCEDURES**

Not Applicable

**SECTION VIII SPECIAL PROTECTION INFORMATION (SEE NOTE)**

**RESPIRATORY PROTECTION (SPECIFY TYPE)** Not generally required or in open well ventilated areas. Use weld fume respirator or air supplied respirator when welding in confined spaces where local exhaust and/or ventilation does not keep exposure below TLV:s 1)

**VENTILATION**

<b>LOCAL EXHAUST:</b> Desirable in semi-open areas to help keep exposures below TLV:s 1)
<b>MECHANICAL (General):</b> Essential in all areas where natural ventilation is not sufficient to keep exposures below TLV:s 1)

**EYE PROTECTION:** Wear welding helmet with eye protection lens shade 10 or darker.

**PROTECTIVE GLOVES:** Welder's Protective Gloves

**OTHER PROTECTIVE EQUIPMENT:** Welder's leather protective aprons, leggings, boots, shoulder covers, hard hats, screens low reflectivity walls or booths.

**SECTION IX SPECIAL PRECAUTIONS**

Weld in well ventilated area. Avoid inhalation of welding fumes

**OTHER PRECAUTIONS:** For additional safety information on welding and cutting, see American National Standards Z49.1-1973, Safety in Welding and Cutting, and the Welding Handbook, Vol.1, Chapter 9, Safe Practices in Welding and Cutting. Both available from 2501 N.W. 7<sup>th</sup> street, Miami, FL 33125