



Form No.: 7946-B

Date: August, 1989

MATERIAL SAFETY DATA SHEET

(Essentially Similar to U.S. Department of Labor Suggested Form For Hazard Communication Standard Compliance)

SECTION I. PRODUCT IDENTIFICATIONPRODUCT TYPE Gas Tungsten Arc Welding Electrodes: Pure, Thoriated, Zirconia and Rare Earth TungstenPRODUCT NAME L-TEC Tungsten ElectrodesCLASSIFICATION AWS A5.12, EWP, EWTh-1, EWTh-2, EWZrMANUFACTURER/SUPPLIER L-TEC Welding & Cutting SystemsADDRESS Box F-6000, Florence, SC 29501 TELEPHONE NO. (803) 669-4411**SECTION II. HAZARDOUS INGREDIENTS***

IMPORTANT! This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with normal use of this product are covered in Section V. A double asterisk (**) before an ingredient indicates that this chemical is considered toxic by and is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR Part 372.

Material (CAS No.)	Weight %	Exposure Limit	
		1989 OSHA PEL-TWA	ACGIH: TLV-TWA
Tungsten (7440-33-7)	98-100	1 mg/m ³ soluble (3 mg/m ³ STEL) 5 mg/m ³ Insoluble (10 mg/m ³ STEL)	1 mg/m ³ (Soluble) 5 mg/m ³ (Insoluble)
**Thorium Oxide (1314-20-1) or Zirconium Compounds (7440-67-7) or Rare Earth Compounds (not established)	0-2 0-1 0-2	None currently established 5 mg/m ³ (10 mg/m ³ STEL) None currently established	None currently established None currently established None currently established

*The term "hazardous" should be interpreted as a term required and defined in the OSHA Hazard Communications Standard (29CFR 1910.1200) and does not necessarily imply the existence of any hazard. Some of the products listed may not contain all of the ingredients shown in Section II. Typical analyses can be found in the appropriate AWS Specification or from your supplier.

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point (760 mm Hg): 5660°C Freezing Point: 3410 +/- 20°C
Specify Gravity: 19.3
Appearance & Odor: Grey metal rod, no odor.

SECTION IV. FIRE & EXPLOSION HAZARD DATA

Non-flammable. Welding arc and sparks can ignite combustible and flammable products. See ANSI Z49.1 "Safety in Welding and Cutting" (referenced in Section VII) for fire prevention and protection information.

L-TEC 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.

SECTION V. REACTIVITY DATA**Hazardous Decomposition Products**

Tungsten electrodes are classified as non-consumable. The quantity of decomposition products of the electrode itself will be extremely small in normal use. Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures, filler metals 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 heated (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder'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).

When the electrode is used, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include:

Welding fumes and gases depending on the process, procedure and metal welded. Some loss of metal from the electrode does occur.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by radiation from the arc.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1 "Method for Sampling Airborne Particles Generated by Welding and Allied Processes" available from the American Welding Society, P. O. Box 351040, Miami, FL 33135.

SECTION VI. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: The ACGIH 1988-89 recommended limit for welding fume, not otherwise classified (NOC) is 5 mg/m³. 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 V for specific fume constituents which may modify this TLV-TWA.

PREEXISTING MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Allergic reaction is possible in sensitive individuals; however, such reaction cannot be predicted due to variation in composition and quantity of the decomposed products.

EFFECTS OF OVEREXPOSURE: Electric arc welding or oxy-fuel gas processes may create one or more of the following hazards:

- **FUMES & GASES** can be dangerous to your health. Primary route of entry is by inhalation.

Short term (acute) overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of the nose, throat, or eyes. Although the inhalation of tungsten has the potential for causing transient or permanent lung damage, it is generally considered to exhibit a low degree of toxicity. Thorium is a naturally occurring radioactive element. Considerable experience in refining and use of thorium has not revealed any adverse effects from industrial exposure.

Long term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and affect pulmonary function.

- **ARC RAYS** can injure eyes and burn skin. **HEAT RAYS** (infrared radiation from flame or hot metal) can injure eyes.
- **ELECTRIC SHOCK** can kill.
- **NOISE** can damage hearing.
- **CARCINOGENIC ASSESSMENT:** (NTP Annual Report, (ARC Mono graphs, other). Thorium dioxide has been identified as a carcinogen. Evidence for its ability to cause cancer has come solely from its internal medical use.
- **EMERGENCY FIRST AID PROCEDURES:** Call for medical aid. Employ first aid techniques recommended by the American Red Cross. IF BREATHING IS DIFFICULT, give oxygen. Call a physician. IN CASE OF ELECTRICAL SHOCK disconnect and turn off power. IF NOT BREATHING, begin artificial respiration, preferably mouth-to-mouth. If no detectable pulse, begin external heart massage. Immediately call a physician. IN CASE OF ARC BURN call a physician.

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

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, P. O. Box 351040, Miami, FL 33135; OSHA Publication 2206 (29CFR1910), U. S. Government Printing Office, Washington, DC 20402; and L-TEC's publications 52- 529 and 2035 for more details on many of the following:

- **VENTILATION:** Use enough ventilation, local exhaust at the flame or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select as per OSHA 29 CFR 1910.134.
- **EYE PROTECTION:** Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade that is too dark to see the weld zone and then go to the next lighter shade (See ANSI Z49.1). Provide protective screens and flash goggles, if necessary, to shield others.
- **PROTECTION CLOTHING:** Wear hand, head, and body protection which help to prevent injury from radiation and sparks. 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 welder not to touch live electrical parts and to insulate himself from work and ground.
- **WASTE DISPOSAL:** Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations.