

# TUNGSTEN ELECTRODE

## MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products  
May be used to comply with OSHA's Hazard Communication Standard 29 CFR 1910.1200  
Standard must be consulted for specific requirements.

### SECTION I (IDENTIFICATION)

Manufacturer/Supplier Name: Freedom Alloys  
P.O. Box 1478  
Cypress, TX 77410-1478  
(281) 807-0757  
Emergency Phone #: (800) 255-3924

Product Name(s): **Tungsten Electrode**: Pure, 2% Thoriated, Lanthanated  
Product Code (s): **10801 10802 10803 10804 10805 10806 10807 10809 10810 10811**

Product Classification: Tungsten electrodes	Pure	2% Thoriated	Lanthanated
Hazard Rating (HMIS)			
Health	1	3	1
Flammability	1	1	1
Reactivity	1	1	1
Other	0	0	0

HMIS Designation Key	4	-Severe Hazard
	3	-Serious Hazard
	2	-Moderate Hazard
	1	-Slight Hazard
	0	-Minimal Hazard

### SECTION II (HAZARDOUS INGREDIENTS/IDENTITY INFORMATION)

Important: This section covers the materials from which these products are manufactured. The fumes and gases produced during normal use of these products are covered by Section V. The term "Hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA Hazard Communication Standard 29 CFR 1910.1200 and it does not necessarily imply the existence of hazard. The chemicals or compounds reportable by Section 313 of SARA are marked by the symbol #.

Material %	By Weight	CAS Number	SEC 313	ACGIH TLV (mg/m3)
<b>Pure Tungsten</b>				
Tungsten	>99	7440-33-7	N/A	5 mg/m3
<b>1% &amp; 2% Thoriated</b>				
Tungsten	98	7440-33-7	N/A	5 mg/m3
Thorium Oxide	<2	1314-20-1	Yes - See Sec. VI	N/A
<b>Lanthanated</b>				
Tungsten	<98.3	7440-33-7	N/A	5 mg/m3
Lanthanum Oxide	>1.5	-	N/A	N/A

Product:	Pure	2% Thoriated	Lanthanated
Boiling point:	5600°C	5900°C	5600°C
Melting point:	3410°C	3400°C	3400°C
Vapor pressure:	N/A	N/A	N/A
Vapor density:	at 25°C N/A	at 25°C N/A	at 25°C N/A
Solubility in water:	INSOLUBLE	INSOLUBLE	INSOLUBLE
Specific gravity:	19.3	19.3	19.2
Evaporation rate:	N/A	N/A	N/A
Appearance and odor:	GREY METAL, NO ODOR	GREY METAL, NO ODOR	GREY METAL, NO ODOR

### SECTION III (FIRE AND EXPLOSION HAZARD DATA)

**FLASH POINT:** N/A

**EXTINGUISHING MEDIA:** Use Class D fire extinguishing agents (dry powder).

**SPECIAL PROCEDURES:** For a powder fire confined to a small area, use a respirator approved for radionuclides. For a large fire, use self contained breathing apparatus.

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**UNUSUAL HAZARDS:** Dusts may present a fire explosion hazard under rare favoring conditions of particle size, dispersion and strong ignition source. However, this is not expected to be a problem under normal handling conditions.

#### SECTION IV (REACTIVITY DATA)

**STABILITY:** Tungsten is a stable material.

In 1% and 2% Thoriated Electrodes, Thorium undergoes spontaneous radioactive decay.

**CONDITIONS TO AVOID:** None.

**HAZARDOUS POLYMERIZATION:** will not occur.

**INCOMPATIBILITY:** The powder metal may ignite on contact with air or strong oxidants (e.g., F2: ClF3; NOx; IF5, PbO2, NO2; and N2O).

**HAZARDOUS DECOMPOSITION PRODUCTS:** None

#### SECTION V (HEALTH HAZARD DATA)

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures, 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 welded (such as paint, plating or galvanizing), the number of welds and volume of the work area, quality and amount of ventilation, 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 consumed, the fume and gas decomposition products generated are different in percentage and form from the ingredients listed in Section II. Fume and gas decomposition products, not the ingredients in the electrode, are important. Decomposition products generated in normal operations include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II plus those from the base metal, coating, etc., as noted above.

It is understood, however, that the elements and/or oxides to be mentioned are virtually always present as complex oxides and not as metals (Characterization of Arc Welding Fume: American Welding Society). The elements or oxides listed below correspond to the ACGIH categories located in "TLV Threshold Limit Values for Chemical Substances and Physical Agents in the workroom Environment." One recommended way to determine the composition and quantity of fumes 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 available from the American Welding Society, P.O. Box 351040, Miami, FL 33126. Also from AWS is F1.2 "Evaluating Contaminants in the Welding Environment-A Sampling Strategy Guide, "which gives additional advice on sampling.) At a minimum, materials listed in this section should be analyzed.

**ROUTES OF ENTRY:** inhalation, ingestion, skin, or eye contact (for dusts, mists, powder and fume).

**HEALTH HAZARDS:** Short-term overexposure to welding fumes may result in discomfort such as dizziness, nausea, or irritation of nose, throat, or eyes. Industrially, pure tungsten and tungsten alloys do not constitute an important health hazard. Exposure is related chiefly to the dust arising out of grinding and machining operations. Chronic inhalation of the dust may cause lung damage in humans.

**\*\*\*CALIFORNIA PROPOSITION 65 WARNING:** This product, when used for welding, soldering, brazing, cutting and other metal working or flame processes produces fumes, particulates, residues and other by-products which contain chemicals known to the state of California to cause cancer and birth defects or other reproductive harm. **WARNING:** This product contains chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.

**\*\*\*NOT BREATHE FUMES!**

**SIGNS AND SYMPTOMS OF EXPOSURE:** headache, dizziness, nausea, irritation of eyes, nose and throat, and burns if protective measures are not observed.

**MEDICAL CONDITIONS FROM EXPOSURE:** none specifically known (see above).

**EMERGENCY & FIRST AID:** Eyes contact: if irritation occurs, flush with large amounts of water for at least 15 minutes; if irritation persists, seek medical attention. Skin contact: wash with soap and water, isolate from exposure if rash occurs; seek medical attention if rash persists. Inhalation: if large amounts of dusts are inhaled, move the exposed person to fresh air. If necessary, perform artificial respiration and seek medical attention. Ingestion: if ingested, seek medical attention, give large quantities of water and induce vomiting. Do not make an unconscious person vomit. Other: wounds should be cleaned thoroughly as soon possible.

**ADDITIONAL INFORMATION:** Tungsten thoria alloy solids do not constitute an important health hazard. Exposure is related chiefly to any dust created. The feeding of 2, 5 and 10% of diet as tungsten metal over a period of 70 days has shown no marked effect upon the growth of rats, as measured in terms of weight gain. Heavy exposure to the dust or the ingestion of large amounts of the soluble compounds produces changes in body weight, behavior, blood cells, etc. in experimental animals. Thoriated tungsten solids do not constitute an important radiological health hazard. However, radiological health hazards may exist if the material is present in a form that may be inhaled or ingested. Electric Shock Can Kill: See Safety in Welding and Cutting, OSHA requirements in 29 CFR 19.10 and ANSI Z49.1 for addition information on welding and safety precautions.

#### SECTION VI (PRECAUTIONS FOR SAFE HANDLING AND USE)

**SPILL AND LEAK PROCEDURE:** N/A

**WASTE AND DISPOSAL METHOD:** Dispose of in accordance with appropriate regulations.

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#### SECTION VII (CONTROL MEASURES)

**RESPIRATORY MEASURES:** Appropriate NIOSH approved respirator equipped with radionuclide filters if airborne dust concentrations are present and exceed the appropriate limits. All requirements set forth in 29 CFR 1910.134 must be met.

**VENTILATION:** Use local exhaust ventilation, which is adequate to limit personal exposure to airborne dust levels, which do not exceed the appropriate limits. If such equipment is not available, use respiratory protection as specified above.

**PROTECTIVE GLOVES:** Welder gloves are recommended.

**EYE PROTECTION:** Safety glasses with side shields or goggles are recommended.

**OTHER PROTECTIVE EQUIPMENT:** Wear appropriate hand, head and body protection to prevent injury from sparks and electrical shock. See ANSI A49-1.

**WORK/HYGIENIC PRACTICES:** For maximum safety be certified for and wear a respirator at all times when welding or brazing.

#### **SECTION VIII (DISCLAIMER)**

This data is believed to be accurate. Freedom Alloys makes no warranty to and disclaims all liability from reliance.

#### **SECTION IX (ADDITIONAL INFORMATION)**

NOT APPLICABLE

Effective date: 01/01/05