

SAFETY DATA SHEET

SDS for GHS: Hazcom 2012 (USA) / WHMIS 2015 (Canada) / NMX-R-019-SCFI-2011 (Mexico)

SECTION : 1 IDENTIFICATION OF SUBSTANCE / MIXTURE AND COMPANY

1.1 Product Name: Tungsten Electrodes

Product Specification: AWS A5.12M/A5.12:2009 (ISO 6848:2004 MOD)

Product Identification: WS2, EWP, EWCe-2, EWLa-1, EWLa-1.5, EWLa-2, **EWTh-1, EWTh-2, EWZr-1, EWZr-8, EWG including (Tri-Mix, Cryo-T: EWTh-4)**. Relevant details pertaining to thorium containing material exhibited in **RED**. All other material classified as Non-Radioactive.

1.2 Identified Uses: Non-melting electrode for arc welding and cutting processes.

Industrial uses for: soldering, brazing, heating elements, emitter, cathode and electrode for lighting industry.

1.3 Supplier: Diamond Ground Products, Inc.

2651 Lavery Court

Newbury Park, CA 91320

Phone: 805-498-3837

Email: sales@diamondground.com

Website: www.diamondground.com

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SECTION : 2 HAZARDS IDENTIFICATION

2.1 Classification of the Mixture:

Solid metallic products are generally classified as "articles" and do not constitute hazardous materials in solid form under OSHA Hazard Communications Standard definitions (29 CFR 1910.1200). **Only large quantities of thoriated tungsten electrodes may pose a radioactive hazard, and the most serious hazards identified in this Section II relate only to thoriated tungsten electrodes. Thorium dioxide 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. Restrictions and hazards pertaining only to thorium containing components are exhibited in RED.**

2.2 Classification in accordance with GHS-US:

STOT RE 1	H315
STOT SE 1	H335
STOT RE 1	H372
Aquatic Acute 1	H410
Aquatic Acute 1	H400

2.3 Label Elements:

Hazard Pictograms (GHS-US):



GHS 07



GHS 08



GHS 09

Signal Word (GHS-US): **DANGER**

Hazard Statements (GHS-US):

- H317 May cause allergic skin reaction
- H319 May cause eye irritation
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H340 Suspected of causing genetic defects**
- H351 Suspected of causing cancer**
- H370 Causes damage to organs**
- H372 Causes damage to organs through prolonged or repeated exposure**
- H400 Very toxic to aquatic life**
- H410 Very toxic to aquatic life with long lasting effects**

Precautionary Statements (GHS-US):

- P201 Obtain special instructions before use
- P202 Do not handle until all safety precautions have been read and understood
- P260 Do not breathe dust/fumes/gas/vapors/spray
- P261 Avoid breathing dust/fumes/gas/vapors/spray
- P264 Wash thoroughly after handling
- P270 Do not eat, drink or smoke when using this product
- P272 Contaminated work clothing should not be allowed out of the workplace
- P273 Avoid release into the environment
- P280 Wear protective gloves
- P284 In case of inadequate ventilation wear respiratory protection
- P302 If on skin wash with soap and water
- P305 If in eyes rinse cautiously with water for several minutes
- P308 If exposed call a poison center or doctor
- P311 If experiencing respiratory symptoms call a poison center or doctor
- P313 If skin irritation or rash occurs get medical attention
- P363 Wash contaminated clothing before reuse
- P402 Store in a dry place in a closed container

2.4 Physical Hazards/ Health Hazards not Otherwise Classified:

- PHNOC : Unknown
- HHNOC : Unknown

2.5 Unknown acute toxicity (GHS-US): No data available

SECTION : 3 COMPOSITION INFORMATION ON INGREDIENTS

3.1 Mixtures:

Substance name		Product Identifier (CAS No)	% Percent	GHS-US classification
Tungsten	W	7440-33-7	> 99.95	Not classified
Thorium Dioxide	ThO₂	1314-20-1	1.70 – 4.00	Carcinogen 1A, H350
Cerium Dioxide	CeO ₂	1345-13-7	1.80 - 2.20	Not classified
Lanthanum Dioxide	La ₂ O ₃	1312-81-8	0.80 - 2.20	Not classified
Zirconium Oxide	ZrO ₂	1314-23-4	0.15 - 0.90	Not classified
Yttrium Oxide	Y ₂ O ₃	1314-36-9	0.07 - 0.09	Not classified

SECTION : 4 FIRST AID MEASURE

4.1 Description of First Aid Measures:

Inhalation: Remove to fresh air and rest in comfortable position. Seek medical attention.

Skin Contact: Flush with water for at least 15 minutes. Seek medical attention if irritation persists.

Eye Contact: Flush with water for at least 15 minutes. Seek medical attention if discomfort persists.

Ingestion: Do NOT induce vomiting. Rinse mouth and seek medical attention.

SECTION : 5 FIREFIGHTING MEASURES

- 5.1 Extinguishing media:** Use alcohol resistant foam, water mist, or dry extinguishing powder or carbon dioxide (CO₂).
- Unsuitable extinguishing media:** No information available
- 5.2 Special Hazards:** Fire may produce irritating or poisonous gases
- Fire hazard:** Not flammable
- Explosion Hazard:** Not known

- 5.3 Special protective gear/precautions for firefighters:** As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH approved full protective gear. Evacuate personnel to safe areas.

SECTION : 6 ACCIDENTAL RELEASE MEASURES

- 6.1 Personal Precautions:** Ensure adequate ventilation especially in confined areas and wear respiratory protection. Avoid creating dust and do not breathe dust/fume/gas/spray. Remove all sources of ignition.
- 6.2 Environmental Precautions:** Avoid release into the environment (soil, drains, sewers)
- 6.3 Method of Containment and Cleanup:** Collect mechanically and dispose in labeled containers according to regional requirements.

SECTION : 7 HANDLING AND STORAGE

- 7.1 Precautions for Safe Handling:** Keep away from heat/sparks/hot surfaces/static discharge. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. **Adopt good practices to prevent accumulation of dust and powders from use or grinding as thorium containing electrodes pose a special health hazard.**
- 7.2 Conditions for safe storage:** Store in cool, dry and well ventilated space. Keep away from any source of ignition as described above. **Store thorium containing material in accordance with local regulations for radioactive substances.**

SECTION : 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

- 8.1 Control Parameters:**

Tungsten	(CAS No) 7440-33-7	
USA ACGIH	ACGIH (TWA) (mg/m ³)	5 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	5 mg/m ³
Thorium Dioxide	(CAS No) 1314-20-1	

USA ACGIH	ACGIH (TWA) (mg/m ³)	No data
USA OSHA	OSHA PEL (TWA) (mg/m ³)	No data
Lanthanum Dioxide (CAS No) 1312-81-8		
USA ACGIH	ACGIH (TWA) (mg/m ³)	10 mg/m ³
USA OSHA	OSHA PEL (Ceiling) (mg/m ³)	15 mg/m ³
Cerium Dioxide (CAS No) 1345-13-7		
USA ACGIH	ACGIH (TWA) (mg/m ³)	No data
USA OSHA	OSHA PEL (TWA) (mg/m ³)	No data
Zirconium Oxide (CAS No) 1314-32-4		
USA ACGIH	ACGIH (TWA) (mg/m ³)	5 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	5 mg/m ³
USA ACGIH	ACGIH STEL (mg/m ³)	10 mg/m ³
Yttrium Oxide (CAS No) 1314-36-9		
USA ACGIH	ACGIH (TWA) (mg/m ³)	1 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³

8.2 Exposure Controls: See American Standard Z49.1 "Safety in Welding and Cutting", published by the American Welding Society, 550 N.W. LeJeune Rd. Miami, FL 33126 and OSHA publication 2206 (29 CFR 1910), U.S. Government Printing Office, Washington, D.C. 20402 for details on hand, eye, skin, respiratory and body protection.

SECTION : 9 PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	- Solid
Color:	- Gray - Silver
Odor:	- Odorless
Odor threshold:	- Not determined
pH:	- Not determined
Relative evaporation rate (butyl acetate = 1):	- Not determined
Melting point:	- approx. 3382 C (6120 F)
Freezing point:	- Not determined
Boiling point:	- approx. 5530 C (9986 F)
Flash point:	- Not determined
Self ignition temperature:	- Not determined
Decomposition temperature:	- Not determined
Flammability (solid, gas):	- Not determined
Vapor pressure:	- Not determined
Relative vapor density at 20· C:	- Not determined
Relative density:	- Not determined
Solubility:	- Not determined
Log Pow:	- Not determined
Log Kow:	- Not determined
Viscosity, kinematic:	- Not determined
Viscosity, dynamic:	- Not determined
Explosive properties:	- Not determined

Oxidizing properties:	- Not determined
Explosive limits:	- Not an explosive

SECTION : 10 STABILITY AND REACTIVITY

- 10.1 Reactivity:** No additional information available.
- 10.2 Chemical Stability:** This material is stable under normal conditions
- 10.3 Possibility of Hazardous Reactions:** Builds hydrogen with acids. Danger of forming hydrogen-air mixtures.
- 10.4 Conditions to Avoid:** In the presence of oxygen and elevated temperatures (>600 C / 1112 F) oxidation, starting at 977 C / 1790 F sublimation of tungsten oxide (WO₃, CAS No. 1314-35-8) and release of thorium dioxide (ThO₂, CAS No. 1314-20-1). Avoid dust generation and accumulation.
- 10.5 Incompatible Materials:** In general, the contact of strong acids and/or alkalis with halogens, oxidizing agents or with earth metals can cause strong reactions. This creates a danger of highly energetic reactions and formation of flammable/toxic gases.
- 10.6** Welding fumes and gases can create complex interactions. When an electrode is consumed, the fume and gas generated can be volatile and toxic. **Also, the oxidation of the product (oxides) can be evaporated (tungsten oxide) or released as thoria (ThO₂ CAS No. 1314-20-1).**

SECTION : 11 TOXICOLOGICAL INFORMATION

- 11.1 Information on toxicological effects:** Harmful if swallowed

Substance name	CAS number	LD50 oral rat (mg/kg)	ATE (oral) (mg/kg)	Comments
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Cerium Dioxide	1345-13-7			No data
Lanthanum Dioxide	1312-81-8			No data
Zirconium Oxide	1314-23-4			No data
Yttrium Oxide	1314-36-9			No data

HAZARDOUS

Chemical Name	Oral LD 50	Dermal LD50	Inhalation LC50
Tungsten(CAS #: 7440-33-7)	> 2000 mg/kg (rat)	> 2000 mg/kg (rat)	> 5.4 mg/L (rat) 4h

Thorium dioxide (CAS#:1314-20-1):
parenteral LD50= 80
mg/kg (mammal)
Intratracheal LD50= > 1140
mg/kg (rat)

Skin Irritation	- Not classified
Eye Irritation	- Not classified
Respiratory Irritation	- Not classified
Skin sensitization	- Not classified
Carcinogenicity	- May cause cancer
Reproductive toxicity	- Not classified

SECTION : 12 ECOLOGICAL INFORMATION

12.1 Toxicity: Very toxic to aquatic life

Chemical Name	Algae/aquatic plants EC50	Fish LC50	Crustacea EC50
Tungsten(CAS #: 7440-33-7)	> 17.7 mg/l 72 h Pseudokirchneriella subcapitata	> 181 mg/l 96 h Danio rerio,	> 163 mg/l 48 h Daphnia magna

12.2 Persistence and Degradability: No additional information available

12.3 Bio-accumulative Potential: No additional information available

12.4 Mobility in Soil: No additional information available

12.5 Other Adverse Effects: No additional information available

SECTION : 13 DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods:

Dispose of in accordance with local and national regulations.

13.2 Relevant regulations thorium (EU):

Council Directive 2006/117/EURATOM on the supervision and control of shipments of radioactive waste and spent fuel.

Nuclear Waste Shipment Regulation –AtAV (Germany)

SECTION : 14 TRANSPORT INFORMATION

(DOT / ADR / RID / ADNR / IMDG / ICAO / IATA)

14.1 UN / ID No. (thorium)

UN2909

UN Proper Shipping name (thorium): RADIOACTIVE MATERIAL, EXCEPTED PACKAGE- ARTICLES MANUFACTURED FROM NATURAL URANIUM OR DEPLETED URANIUM OR NATURAL THORIUM

Hazard Class (thorium):

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SECTION : 15 REGULATORY INFORMATION

15.1 US Federal Regulations

Tungsten	(CAS No.) 7440-33-7	TSCA Inventory (listed)	SARA Section 313
Thorium Dioxide	(CAS No.) 1314-20-1	TSCA Inventory (listed)	SARA Section 313
Cerium Dioxide	(CAS No.) 1345-13-7	TSCA Inventory (listed)	SARA Section 313
Lanthanum Dioxide	(CAS No.) 1312-81-8	TSCA Inventory (listed)	SARA Section 313
Zirconium Dioxide	(CAS No.) 1314-23-4	TSCA Inventory (listed)	SARA Section 313
Yttrium Oxide	(CAS No.) 1314-36-9	TSCA Inventory (listed)	SARA Section 313

15.2 US State Regulations

Tungsten	(CAS No.) 7440-33-7	MA MN NJ PA	Right to Know List Hazardous Sub. List Right to Know List Right to Know List
Thorium Dioxide	(CAS No.) 1314-20-1	CA MA MN NJ PA	Prop 65 Carcinogen Right to Know List Hazardous Sub. List Right to Know List Right to Know List

Cerium Dioxide	(CAS No.) 1345-13-7	MA MN NJ PA	Right to Know List Hazardous Sub. List Right to Know List Right to Know List
Lanthanum Dioxide	(CAS No.) 1312-81-8	MA MN NJ PA	Right to Know List Hazardous Sub. List Right to Know List Right to Know List
Zirconium Dioxide	(CAS No.) 1314-23-4	MA MN NJ PA	Right to Know List Hazardous Sub. List Right to Know List Right to Know List
Yttrium Oxide	(CAS No.) 1314-36-9	MA MN NJ PA	Right to Know List Hazardous Sub. List Right to Know List Right to Know List

SECTION : 16 OTHER INFORMATION

16.1 NFPA

NFPA Health Hazard: 2-Warning may be harmful if inhaled or absorbed

NFPA Fire Hazard: 0-Materials that will not burn

NFPA Reactivity: 0-Normally stable, even under fire exposure conditions, and not reactive with water



16.2 HMIS Rating

Health: 3-Major Hazard-major injury likely unless prompt action is taken and medical treatment given

Flammability: 0-Minimal Hazard

Physical: 0-Minimal Hazard

16.3 The safety data sheet issued also complies with the regulation Annex I of Regulation (EU) No. 453/2010 and Annex II of Regulation (EU) No. 2020/878.

DISCLAIMER: *The information provided in this Safety Data Sheet is correct to the best of our knowledge at the date of its publication. The information is provided as guidance and is not considered a warranty or quality specification. It is the user's obligation to determine the conditions of safe use of these products.*



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