

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:** EWP, EWCe-2, EWLa-1, EWLa-1.5, EWLa-2, **EWTh-1, EWTh-2, EWZr-1, EWZr-8, EWG including (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
- Revision:** 03 February 2020

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 |
|-------------------|------------|-----------------------|--------------------|----------|
| 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 | Ora | 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 | 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): 7

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 | Right to Know List Hazardous Sub. List |



| | | | |
|-------------------|---------------------|----------------------|---|
| | | NJ PA | 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

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.*

EMERGENCY CONTACT: CHEMTREC (800) 424-9300

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