SAFETY DATA SHEET

Section 1: Product and Company Identification

Product Identifier:	**PowerWeld Tungsten Electrode**
Product Use:	Non-melting electrodes for Gas Tungsten Arc Welding (GTAW / TIG)
Item Code:	1PC__ / 2PC__ / CER__ / ZIR__ / PUR__ / RE__ / LAN15__ / LAN20__ / TM__
Supplier Name:	PowerWeld Inc.
Supplier Address:	2501 Beech Street Valparaiso, IN 46383
Supplier Web Address:	www.powerweldinc.com
Supplier Phone:	219-462-8700 1-800-826-9073
Emergency Phone:	CHEMTREC (24 hour) 1-800-424-9300
Prepared By:	PowerWeld Inc.
Preparation Date:	3 December 2015
Specification:	AWS A5.12M/A5.12:2009
WHMIS Classification:	D-2A

Section 2: Hazard Identification

Classification:

Specific target organ toxicity; single exposure (kidneys, respiratory system)	Category 1
Specific target organ toxicity; repeated exposure (respiratory system, skin)	Category 1
Hazardous to aquatic environment; acute hazard	Category 1
Hazardous to aquatic environment; chronic hazard	Category 1

Label Elements:

Hazard Phrases

- H317 May cause an allergic skin reaction.
- H320 Causes eye irritation.
- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H341 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

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P260 Do not breathe dust/fume/gas/mist/vapours/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 to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P281 Use personal protective equipment as required.
P285 In case of inadequate ventilation wear respiratory protection.
P302 IF ON SKIN: wash with soap and water. Wash contaminated clothing before reuse. If skin irritation persists, contact a physician.
P304 IF INHALED: move person to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and transport to nearest medical facility for additional treatment.
P305 IF IN EYES: immediately flush upper and lower eyelids with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Rest eyes for 30 minutes. If redness, burning, blurred vision or swelling persists, visit nearest medical facility for additional treatment.
P308 IF exposed or concerned: seek medical advice or attention.
P312 Call a POISON CENTER or doctor/physician if you feel unwell.

Section 3: Composition/Information on Hazardous Ingredients

CHEMICAL FORMULATION (AWS DESIGNATION)	HAZARDOUS INGREDIENTS	CAS NUMBER	APPROXIMATE CONCENTRATION (%)	TIP COLOUR
EWTh-1	Thorium Dioxide (ThO_2)	1314-20-1	0.8 – 1.2	Yellow
EWTh-2	Thorium Dioxide (ThO_2)	1314-20-1	1.7 -2.2	Red
EWCe-2	Cerium Dioxide (CeO_2)	1345-13-7	1.8 – 2.2	Orange or Grey
EWZr-1	Zirconium Dioxide (ZrO_2)	1314-23-4	0.15 – 0.5	Brown
EWP	Tungsten (W)	7440-33-7	>99.95	Green
EWLa-1	Lanthanum Dioxide (La_2O_3)	1312-81-8	0.8 – 1.2	Black
EWLa-1.5	Lanthanum Dioxide (La_2O_3)	1312-81-8	1.3 – 1.7	Gold
EWLa-2	Lanthanum Dioxide (La_2O_3)	1312-81-8	1.8 – 2.2	Blue
TM (Tri-Mix)	Lanthanum Dioxide (La_2O_3) Zirconium Dioxide (ZrO_2) Yttrium Oxide (Y_2O_3)	1312-81-8 1314-23-4 1314-36-9	1.3 – 1.7 0.06 – 0.1 0.06 – 0.1	Lime Green
**Additional ingredient for all*	Tungsten (W)	7440-33-7	Balance	

Section 4: First-aid Measures

Inhalation: If breathed in, move person to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and transport to nearest medical facility for additional treatment.

Ingestion: Unlikely due to form or product; however, if ingested, DO NOT induce vomiting. Call physician immediately. Never give anything by mouth to an unconscious person. Risk of product entering the lungs on vomiting after ingestion.

Eye Contact: Immediately flush upper and lower eyelids with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least

15 minutes. Rest eyes for 30 minutes. If redness, burning, blurred vision or swelling persists, visit nearest medical facility for additional treatment.

Skin Contact: Wash with soap and water. Wash contaminated clothing before reuse. If skin burn is present, submerge affected area in cold water until burning sensation ceases. If skin irritation persists, contact a physician.

Symptoms: No first aid measures should be required for unused electrodes; first aid measures are relevant only during welding operations.

NOTE: In all severe cases, contact physician immediately. Local telephone operators can provide number of regional poison control centre.

Section 5: Fire-fighting Measures

Product is not flammable as shipped. Be cautious when in use as welding arcs and sparks can ignite combustibles.

Section 6: Accidental Release Measures

Protective Equipment: Not applicable
Emergency Procedures: Not applicable
Leak or Spill Procedure: Not applicable

Section 7: Handling and Storage

Handling Procedures and Equipment: No special equipment is required when handling product as shipped. For recommended PPE while welding or grinding, see Section 8. Handle in accordance with good industrial hygiene and safety practices. Do not eat, drink or smoke when using this product. Wash hands thoroughly before breaks and at the end of the workday.

Storage Requirements: Packaging and loose tungsten electrodes should be properly labeled in order to identify source materials. Store product away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials.

Incompatibilities: Strong oxidizing agents

Section 8: Exposure Controls/Personal Protection

Exposure Limits:

CHEMICAL FORMULATION (AWS DESIGNATION)	HAZARDOUS INGREDIENTS	CAS NUMBER	TWA (mg/m^3)	OSHA PEL (mg/m^3)
EWTh-1	Thorium Dioxide (ThO_2)	1314-20-1	-	-
EWTh-2	Thorium Dioxide (ThO_2)	1314-20-1	-	-
EWCe-2	Cerium Dioxide (CeO_2)	1345-13-7	-	-
EWZr-1	Zirconium Dioxide (ZrO_2)	1314-23-4	5	5
EWP	Tungsten (W)	9940-33-7	10	5
EWLa-1	Lanthanum Dioxide (La_2O_3)	1312-81-8	-	-
EWLa-1.5	Lanthanum Dioxide (La_2O_3)	1312-81-8	-	-
EWLa-2	Lanthanum Dioxide (La_2O_3)	1312-81-8	-	-
TM (Tri-Mix)	Lanthanum Dioxide (La_2O_3) Zirconium Dioxide (ZrO_2) Yttrium Oxide (Y_2O_3)	1312-81-8 1314-23-4 1314-36-9	- 5 1	- 5 1
**Additional ingredient for all*	Tungsten (W)	7440-33-7	10	5

Engineering Controls: Good general ventilation is sufficient for product when not in use during the welding process. Ensure proper ventilation and respiratory protection is used when welding, brazing or processing. Respiratory protection is

	recommended and information may be found regarding the OSHA STANDARDS (29 CRF 1910.134), as well as CSA Standards Z94.4, along with many other safety standards.
Personal Protective Equipment:	Respiratory: Not required under normal conditions of use. A properly fitting fume respiratory or air supplied respirator should be used when welding in a confined space or work area where local exhaust and/or ventilation does not keep exposure below threshold limits indicated above. Hands: For contact in form as shipped, no special equipment is required. For use during the welding process, approved welder's gloves suitable for the appropriate task are recommended to prevent injury from sparks and electric shock. Eyes: Safety eyewear should be used if exposure is likely. During the welding process, an approved welding helmet or face shield with a filter lens shade 12-14 or higher is recommended. Other persons around the workspace should also be protected by shaded welding screens and eyewear if necessary. Skin: Approved protection (ie./ welders gloves, apron, sleeves, jacket, etc.) should be worn to prevent injury from sparks and electrical shock during the welding process.
Additional Notes:	Thoriated electrodes contain Thorium which is a naturally occurring radioactive element. Primary hazard lies in the inhalation of dust/fumes. The actual amount of Thorium in the weld fumes depends on the grade of thoriated electrode used, as well as welding parameters. Exposure is negligible under DC supply, but is higher during grinding and AC welding. Normal handling of these electrodes is not expected to result in any significant radiation exposure.

Section 9: Physical and Chemical Properties

Physical State:	Solid (stick/bar)
Odor and Appearance:	Odorless and silver/metallic grey color
Odor Threshold (ppm):	Not applicable
pH:	Not available
Melting Point:	3400°C (6152°F)
Freezing Point:	Not applicable
Boiling Point:	5900°C (10 650°F)
Flashpoint:	Not applicable
Upper Flammable Limit (% by volume):	Not applicable
Lower Flammable Limit (% by volume):	Not applicable

Section 10: Stability and Reactivity

Chemical Stability:	Stable
Possible Hazardous Reactions:	Will not occur under normal conditions and use.
Conditions to Avoid:	None known
Materials to Avoid (Incompatibilities):	Oxidizing materials
Hazardous Decomposition By-Products:	Tungsten exposed to air: from 500°C onwards, oxidation to tungsten oxide (WO_3); from 850°C onwards, evaporation of build-up of tungsten oxides.
Hazardous Polymerization:	Hazardous polymerization does not occur.

Section 11: Toxicological Information

Skin Contact:	Arc rays can burn skin; skin cancer has been reported.
Skin Absorption:	Not applicable
Eye Contact:	Arc rays can injure eyes.
Inhalation:	Inhalation is the most likely route of exposure; refer to "Effects of Acute Exposure" and "Effects of Chronic Exposure" below.
Ingestion:	Unlikely due to form of product.
Effects of Acute Exposure:	Radiant energy can produce "flash burns" of eyes and skin. Electric shock can kill. Overexposure or inhalation of large amounts of welding fumes may cause symptoms such as metal fume fever, dizziness, nausea, dryness and irritation of your nose, throat or eyes as well as lung disease.
Effects of Chronic Exposure:	Overexposure or prolonged inhalation of large amounts of welding fumes may cause bronchitis or cancer. Other overexposure or prolonged inhalation of large amounts of welding fumes symptoms may include damage to the central nervous system, respiratory system, skin and could affect organs such as pancreas and liver. Deposits could enter lungs impairing lung function and causing possible irreversible tissue damage.
Irritancy of Product:	Tungsten is a mild irritant to eyes and skin.
Carcinogenicity:	Thorium is radioactive and is a *National Toxicology Program* known carcinogen.
Reproductive Effects:	None known
Toxicological Data:	Not available

Section 12: Ecological Information

Aquatic and Terrestrial Toxicity:	Welding produces fumes and gases that may cause long-term negative effects on the environment if released directly into the atmosphere. Some materials may produce Carbon Dioxide (CO_2) gas if welded with the tungsten electrodes specified in this data sheet. Waste from these tungsten electrodes can be very toxic to aquatic life if not properly disposed of.
Persistence and Degradability:	Not available
Bioaccumulative Potential:	Not available
Soil Mobility:	Not available

Section 13: Disposal Considerations

NOTE: Always dispose of waste in accordance with local, state and federal regulations.

Safe Handling:	Gloves can be worn when handling used and discarded materials. Product is not harmful as shipped.
Methods of Disposal:	Avoid dispersal and contact of spilled material and runoff with soil, waterways, drains and sewers. Packaging and tungsten electrode stubs can be disposed of as general waste or recycled. For larger quantities, be sure to dispose in accordance with local, provincial/state and federal regulations.

Section 14: Transportation Information

As finished product, tungsten electrodes are not subject to special shipping conditions. Thoriated tungsten electrodes may be subject to conditions if shipped in large quantities as Class 7 radioactive materials.

Section 15: Regulatory Information

WARNING! This product (EWTh-1 and EWTh-2) contains a chemical (Thorium) known to the State of California to cause cancer.

Thorium Dioxide is a National Toxicology Program *known carcinogen.*

Massachusetts Substances:	Tungsten; Thorium Oxide
New Jersey Hazardous Substances:	Tungsten; Thorium Oxide
Pennsylvania Right to Know Hazardous Substances:	Tungsten; Thorium Oxide
SARA 302/304/311/312 Hazardous Chemicals:	Tungsten; Thorium Oxide
SARA 311/312 Chemical Inventory Hazard Identification:	Tungsten – immediate (acute) health hazard, delayed (chronic) health hazard; Thorium Oxide – delayed (chronic) health hazard

Section 16: Other Information

Preparation Date:	3 December 2015
Date of Last Revision:	3 December 2015

This SDS format is in accordance with GHS. PowerWeld Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Product use and conditions of use are beyond the control of PowerWeld. Warranty of materials is limited to test results of product performance as detailed in certificates of compliance. Interpretation of test results is the responsibility of end-user. No other warranties, expressed or implied, are made.