



SAFETY DATA SHEET (SDS)

MSDS: Tungsten Electrode
REVISED 11-2017
SDS Number: 027- EW

For Welding Consumables and Related Products
 Conforms to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS),
 OSHA Hazard Communication Standard 29CFR 1910.1200
 Standard Must Be Consulted for Specific Requirements

SECTION I – IDENTIFICATION of Product and Company

Manufacturer/Supplier: Washington Alloy Company	Recommended use: Tungsten for GTAW welding process	Restriction on use: Not Known	Telephone No: 704-598-1325
Address: 7010-G Reames Rd, Charlotte, NC 28216			Emergency No: 704-598-1325
Trade Name of Tungsten Electrode:	AWS Color Id	Classification:	Specification:
Pure Tungsten, 2% Ceriated Tungsten 1% Lanthanated Tungsten 1.5% Lanthanated Tungsten 2% Lanthanated Tungsten 1% Thoriated Tungsten 2% Thoriated Tungsten Zirconated Tungsten Zirconated Tungsten Zr-8 Rare Earth (La2O3, CeO2, Y2O3)	Green (formerly Orange) Grey Black Gold Blue Yellow Red Brown White Purple	EWP (WP) EWCe-2 (WCe20) EWLa-1 (WLa10) EWLa-1.5 (WLa15) EWLa-2 (WLa20) EWTh-1 (WTh10) EWTh-2 (WTh20) EWZr-1 (WZr3) EWZr-8 (WZr8) EWG	AWS A5.12 (ISO 6848)

SECTION II – COMPOSITION / INFORMATION ON INGREDIENTS

GHS Hazard Classification: STOT-RE 1 H315 Causes skin irritation
 STOT-SE 1 H335 May cause respiratory irritation ;STOT-RE 1 H372 Causes damage to organs through prolonged or repeated exposure
 Aquatic Acute 1 H400 Very toxic to aquatic life ; Aquatic Acute 1 H410 Very toxic to aquatic life with long-lasting effects/

Label Elements –



GHS07



GHS08



GHS09

Hazard statement and Precautionary statement =

Hazard Statements

Causes eye irritation, May cause an allergic skin reaction, May cause allergy or asthma symptoms or breathing difficulties if inhaled Suspected of causing genetic defects, Suspected of causing cancer, Causes damage to organs (kidneys, respiratory system), Causes damage to organs through prolonged or repeated exposure, Very toxic to aquatic life, Very toxic to aquatic life with long lasting effects

Precautionary Statements:

Do not breathe dust/fume/gas/mist/vapors/spray_ Obtain special instructions before use, Do not handle until all safety precautions have been read and understood, Avoid breathing dust/fume/gas/mist/vapors/spray, Wash thoroughly after handling, Do not eat, drink or smoke when using this product, Contaminated work clothing should not be allowed out of the workplace, Avoid release into the environment, Wear protective gloves

In case of inadequate ventilation wear respiratory protection, _If exposed: Call a POISON CENTER or doctor/physician If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. If eye irritation persists seek medical advice/attention.

If experiencing respiratory symptoms: Call a POISON CENTER and / or doctor / physician, If on skin: Wash with plenty of soap and water, If skin irritation or rash occurs: Get medical advice / attention, Wash contaminated clothing before reuse, If exposed or concerned: Seek medical advice / attention. Collect spillage. Store in a dry place. Store in a closed container. With thoriated tungsten electrodes, they may emit beta and gamma radiation and additional measures should be taken to protect yourself and others.

Other Hazards which do not result in GHS classification and Overview: Electric shock can kill. Wear approved head, hand and body protection, which help to prevent injury from radiation, sparks and electrical shock. Welding arc and sparks can ignite combustibles or flammable materials. See ANSI Z-49.1. This would include wearing welder’s gloves and a protective face shield and may include arm protectors, apron, hats, shoulder protection, as well as dark substantial clothing. Welders should be trained not to allow electrically live parts to contract the skin or wet clothing and gloves. The welders should insulate themselves from the work and ground. Arc Rays can injure eyes and burn skin. Read and understand the manufacturer’s instructions and precautionary label on this product and your employer’s safety practices. See Section XIII.

As shipped these are odorless solid rods that are nonflammable, non-explosive.

Substance: Welding fumes and gases cannot be classified simply. The composition and quantity of these fumes and gases are dependent upon the metal being welded, the procedures followed, and the electrodes used. Fumes may affect eyes, skin, respiratory system as well as pancreas and liver.

Workers should be aware that the composition and quantity of fumes and gases to which they may be exposed, are influenced by: coatings which may be present on the metal being welded (such as paint, plating, or galvanizing), the number of welders in operation 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 procedure). When the electrode is consumed, the fumes and gas decomposition products generated are different in percent and form from the ingredients listed in Section III, The composition of these fumes and gases are the concerning matter and not the composition of the electrode itself. Decomposition products include those originating from the volatilization, reaction, or oxidation of the ingredients shown in Section III, plus those from the base metal, coating and the other factors noted above.

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Reasonable expected fume constituents of this product would include: Complex oxides or compounds may be present when using tungsten and or fluxes

Chemical Identity	CAS No.	EINECS#
Carbon dioxide	124-38-9	204-696-9
Carbon monoxide	630-8-0	211-128-3
Nitrogen dioxide	10102-44-0	-
Ozone	10028-15-6	233-069-2

SECTION III – COMPOSITION / INFORMATION ON INGREDIENTS

*The term “HAZARDOUS MATERIALS” should be interpreted as a term required and defined in OSHA HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200 however the use of this term does not necessarily imply the existence of any hazard.

Chemical Identity Ingredients	CAS No.	EINECS#	Chemical Identity Ingredients	CAS No.	EINECS#
Tungsten (W)	7440-33-7	231-143-9	Cerium Dioxide (CeO ₂)	1306-38-3	215-150-4
Thorium Dioxide (ThO ₂) ⁽¹⁾	1314-20-1	253-453-3	Lanthanum Dioxide (La ₂ O ₃)	1312-81-8	215-200-5
Zirconium Oxide (ZrO ₂)	1314-23-4	215-227-2	Yttrium Oxide (Y ₂ O ₃)	1314-36-9	215-233-5

Other elements or ingredients may be present but in quantities much less than 1%.⁽¹⁾ Subject to reporting requirements of Section 302, 304, 311, 312, and 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40CFR 370 and 372; (Resp) = Respiratory/ Respiration: Welding and cutting of products that contain Chromium may produce hexavalent chromium and YOU should read and follow OSHA’s final rules Fed Register #:71:10099-10385 dated 02-28-2006. Occupational Safety and Health Administration 29 CFR 1910.1000 Permissible Exposure Limit (PEL). American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Value (TLV[R]). *Ceiling Limit **Short Term Exposure Limit Single values are maximum

AWS Classification	W	CeO ₂	LaO ₂	ThO ₂	ZrO ₂	Y ₂ O ₃	Color code	RGB #
EWP (WP)	Pure Tungsten	99.5(Min.)					Green	#008000
EWCe-2 (WCe20)	2% Ceriated Tungsten	Balance	1.8-2.2				Gray	#808080
EWLa-1 (WLa10)	1% Lanthanated Tungsten	Balance		0.8-1.2			Black	#000000
EWLa-1.5 (WLa15)	1.5% Lanthanated Tungsten	Balance		1.3-1.7			Gold	#FFD700
EWLa-2 (WLa20)	2% Lanthanated Tungsten	Balance		1.8-2.2			Blue	#0000FF
EWTh-1 (WTh10)	1% Thoriated Tungsten	Balance		0.8-1.2			Yellow	#FFFF00
EWTh-2 (WTh20)	2% Thoriated Tungsten	Balance		1.7-2.2			Red	#FF0000
EWZr-1 (WZr3)	Zirconated Tungsten	Balance			0.15-0.50		Brown	#A52A2A
EWZr-8 (WZr8)	Zirconated Tungsten Zr-8	Balance			0.7-0.9		White	#FFFFFF
EWG	Rare Earth Tungsten	Balance		1.0-2.0	0.05- 0.2	0.05- 0.2	Purple	#800080

Gray Was formerly the color identification for EWG in 1998

Orange Was formerly the color identification for EWCe-2 in 1998 now it is Gray

SECTION IV – FIRST AID MEASURES

Contact with skin, eyes, ingestion or injection should not be a source for exposure with proper protection.

Ingestion: Avoid contact with metal fume or powers from granular flux which may lead to ingestion

Inhalation: If breathing has stop or difficult move to fresh air and as needed perform artificial respiration. Call medical assistance or physician.

Skin Contact: Remove any contaminated clothing, gloves or other personnel equipment and promptly wash/flush with mild soap and water. For reddish or blistered skin from thermal/arc radiation promptly wash/flush with water. Get medical assistance or physician help as needed.

Eye Contact: Arc radiation can injure eyes and also cause an arc flash – if this occurs, move to dark room removing lenses as required and get rest and cover eyes with non-stick dressings (padded dressing) Removal of dust and fumes requires flushing with abundant amounts of clean water for at least 15 minutes. Get medical assistance or physician help as needed or if issues persist.

Most important symptoms/effects, acute and delayed:

Symptoms: Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, dryness or irritation of nose, throat, or eyes. Pre-existing respiratory issues may be aggregated. Long-term (chronic) over-exposure to welding fumes can lead to siderosis (iron deposits in lung) and is believed to affect pulmonary function. Manganese and Manganese compounds above safe exposure limits can affect or cause irreversible damage to the central nervous system, including the brain: symptoms may result in impaired speech and movement, lack of energy, stiffness in legs, feet, toes, muscular weakness as well as psychological disturbances. Reports of bronchitis and lung fibrosis have also been noted. DUST after skin contact may cause irritation. Should not be a source for exposure with proper protection however; Contact with eyes may cause irritation and ingestion may be harmful

Hazards: Welding fumes and gases cannot be classified simply. Refer to Section II under Substance

SECTION V – FIRE-FIGHTING MEASURES

As shipped these are odorless rods that are nonflammable, non-explosive Welding arcs and sparks can ignite combustibles or flammable materials Read and understand the manufacturer’s instructions and precautionary label on this product and your employer’s safety practices. Read and understand: American National Standard ANSI Z49.1 *Safety in Welding, Cutting and Allied Processes*, published by the AMERICAN WELDING SOCIETY, 550 N.W. LeJeune Road, Miami, Florida 33126; OSHA *Safety and Health Standards* are published by the U.S. Government Printing Office, 732 North Capitol Street NW, Washington, DC 20401. Also, National Fire Protection Association NFPA 51B, *Standard for Fire Prevention During Welding, Cutting and other Hot Work*

Suitable (and unsuitable) extinguishing media: As shipped these items will not burn however in the event use media recommended for the burning materials and fire situation and surroundings. No unsuitable media known at this time. Do not use water or halogenated on molten metals.

Specific hazards arising from the chemicals: Welding arcs and sparks can ignite combustibles or flammable materials

Specific protective equipment and precautions for firefighters: Wear self-contained breathing apparatus and full protective clothing in case of fire or when fumes and vapors are present. Follow general fire-fighting precautions as in the workplace. May produce poisonous gases during fire.

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SECTION VI – ACCIDENTAL RELEASE MEASURES

Personal Precautions, protective equipment and emergency procedures: With airborne dust and fumes, be sure to use adequate engineering ventilation controls and personal protection to prevent overexposure limits recommendations found in Section VIII.

Environment precautions: Control work practices to eliminate environmental release. These products are gray to silver solid metal rods, with no spill or leak hazards as shipped. If product becomes molten dam up with sand type media until it cools back to a solid and recycle as scrap. See section 7, 8 and 13 for other needed data.

Methods and Materials for containment and cleaning up: Solid rods can be picked up and placed back in the original container. Clean up immediately while following all safety guidelines as well as using all personal protection safety listed in section VIII. Avoid generating dust and prevent materials from entering and drains, sewers or water sources. Disposal considerations found in Section XIII.

When fumes and vapors are present follow general fire-fighting precautions as in the workplace and all applicable regulations.

SECTION VII – HANDLING AND STORAGE

Precautions for safe handling: Handle with care wearing gloves and keep formation of airborne dust and fumes to a minimum. Thorium Oxide dust may be a SOURCE MATERIAL as defined by the Nuclear Regulatory Commission and is subject to the requirements of 10CFR, Parts 20 and 40. Routine wet-mopping or vacuuming with an explosion-proof vacuum filter, fitted with a HEPA filter should be considered to reduce the accumulation of dusts.

SPECIAL PRECAUTIONS REQUIRED DURING GRINDING, MACHINING OR ANY OTHER WAYS DUST OR FUMES ARE GENERATED WITH THORIUM or THORIUM OXIDES.

Storage: Store in a cool dry place away. Avoid extreme temperatures and incompatible items such as acids, oxidizers and halogens.

If needed use adequate engineering ventilation controls and personal protection to prevent overexposure limits recommendations found in Section VIII. Also read American National Standard ANSI Z49.1 *Safety in Welding, Cutting and Allied Processes*, published by the AMERICAN WELDING SOCIETY, 550 N.W. LeJeune Road, Miami, Florida 33126; OSHA *Safety and Health Standards* are published by the U.S. Government Printing Office, 732 North Capitol Street NW, Washington, DC 20401. Do not eat or drink while using these products and ensure proper ventilation is used. Wash hands after use thoroughly and ensure good housekeeping. **Conditions for safe storage, including any incompatibilities:** All employees who handle these products should be trained to handle it safely. Open packages of these products/containers on a safe stable surface and must be properly labeled always. Store products in original closed packages, cool dry place, while avoiding extreme temperatures or incompatible items such as acids, oxidizers and halogens. Always follow all regulations in accordance with local/regional/state/national guidelines.

SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Flux or other ingredients	CAS No.	EINECS#	Exposure Limit (mg/m ³)	
			OSHA PEL	ACGIH TLV
Tungsten (W)	7440-33-7	231-143-9	5 (as Zr) 10**	5 (as Zr) 10**
Thorium Dioxide (ThO ₂) ⁽¹⁾	1314-20-1	253-453-3		
Cerium Dioxide (CeO ₂)	1306-38-3	215-150-4		
Lanthanum Dioxide (La ₂ O ₃)	1312-81-8	215-200-5	15	10
Yttrium Oxide (Y ₂ O ₃)	1314-36-9	215-233-5	1.0	1.0
Zirconium	7440-67-7	231-176-9	5 (as Zr) 10**	5 (as Zr) 10**

Other elements or ingredients may be present but in quantities much less than 1%. ⁽¹⁾ Subject to reporting requirements of Section 302, 304, 311, 312, and 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and 40CFR 370 and 372; (Resp) = Respiratory/ Respiration: Welding and cutting of products that contain Chromium may produce hexavalent chromium and YOU should read and follow OSHA's final rules Fed Register #:71:10099-10385 dated 02-28-2006. Occupational Safety and Health Administration 29 CFR 1910.1000 Permissible Exposure Limit (PEL). American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV[R]). *Ceiling Limit **Short Term Exposure Limit ***Inhalable fraction

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits used a guideline in control for health hazards but not an indication of safe and dangerous exposure limits **TLV - Threshold Limit Value** - an airborne concentration of a substance, which represents conditions under which it is generally believed that nearly all workers, may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour & **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. **OSHA** - U.S. Occupational Safety and Health Administration. **PEL - Permissible Exposure Limit** - this exposure value means the same as a TLV, except that it is limits guideline by OSHA. **Eye Protection:** Wear a helmet or face shield with a filter lens shade number 12-14 or darker for arc welding. Shield other workers by providing screens and flash goggles. Use face-shield with filter lens of appropriate shade number (per ANSI Z49.1-1988, "Safety in Welding and Cutting"). **Protective Clothing:** Wear approved head, hand and body protection, which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z-49.1. This would include wearing welder's gloves and a protective face shield and may include arm protectors, apron, hats, shoulder protection, as well as dark substantial clothing. Welders should be trained not to allow electrically live parts to contract the skin or wet clothing and gloves. The welders should insulate themselves from the work and ground. **Ventilation:** Use plenty of ventilation and/or local exhaust at the arc, to keep the fumes and gases below the threshold limit value within the worker's breathing zone and the general work area. Welders should be advised to keep their head out of the fumes. **Respiratory Protection:** Use respirable fume respirator or air supplied respirator when welding in a confined space or general work area where local exhaust and/or ventilation does not keep exposure below the threshold limit value.

HYGIENE/ WORK PRACTICES: With all chemicals/materials, avoid getting these products ON YOU or IN YOU. Wash hands after handling these products. Do not eat or drink while handling these products. Use ventilation and other engineering controls to minimize potential exposure to these products.

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SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

Appearance / Color / Odor / Physical state / Form: Gray to silver round solid welding rods that are hard/brittle and odorless

Odor Threshold / pH / Flash Point / Evaporation Rate / Flammability (Solid, Gas) / Upper & Lower Flammability or Explosive Limits: No data available
Vapor Pressure & Density / Relative Density / Solubility(water/other) / Partition coefficient (n-octanol/water) / Auto-ignition Decomposition temperature : No data available
BOILING POINT: 10652°F (5900°C) **FREEZING/MELTING POINT:** 6152°F (3400 °C) **SPECIFIC GRAVITY (water = 1):** 19.3

SECTION X – STABILITY and REACTIVITY

Chemical stability: These products are considered stable as shipped and under normal conditions; **Possibility of hazard reactions:** No data and will not occur; **Conditions to avoid:** Avoid exposure to extreme temperatures, Incompatible materials and avoid dust from product; **Incompatible materials:** Incompatible items such as acids, oxidizers and halogens Strong acids, strong oxidizers, mineral acids, and halogens. **Hazardous decomposition products:** Read Substance in Section II. Welding and cutting of products that contain Chromium may produce hexavalent chromium and YOU should read and follow OSHA's final rules Fed Register #: 71:10099-10385 dated 02-28-2006. Occupational Safety and Health Administration 29 CFR 1910.1000 Permissible Exposure Limit (PEL). The best method to determine the actual composition of generated fumes and gases is to take an air sample from inside the welder's helmet if worn or in breathing zone. For additional information, refer to the American Welding Society Publication, "Fumes and Gases in the Welding Environment". When electrode is consumed tungsten oxides may be present as well as thoriated tungsten electrodes, they may emit beta and gamma radiation and additional measures should be taken to protect yourself and others

SECTION XI- TOXICOLOGICAL INFORMATION

Oral/Dermal/inhalation: Acute oral toxicity; Tungsten: > 2000 mg/kg. Oral (rat); Inhalation(LC50)> 5.4 mg/L 4h (rat); **Zirconium** Acute oral toxicity (LD50): 3500 mg/kg [Rat]. THORIUM OXIDE: TDLo (Parenteral-Woman) 1 gm/kg; Tumorigenic: Carcinogenic by RTECS criteria; Liver: tumors TDLo (Unreported-Human) 2880 mg/kg; Tumorigenic: neoplastic by RTECS criteria; Liver: tumors TDLo (Intraarterial-Human) 490 mg/kg; Tumorigenic: Carcinogenic by RTECS criteria, tumors at site of application TD (Parenteral-Human) 700 mg/kg; Tumorigenic: neoplastic by RTECS criteria; Liver: angiosarcoma; Blood: tumors TD (Parenteral-Human) 1260 mg/kg; Tumorigenic: neoplastic by RTECS criteria; Liver: angiosarcoma; Blood: tumors TD (Parenteral-Woman) 2350 mg/kg; Tumorigenic: Carcinogenic by RTECS criteria; Kidney, Ureter, Bladder: Kidney tumors TD (Intraarterial-Man) 1190 mg/kg; Tumorigenic: Carcinogenic by RTECS criteria; Liver: tumors; Blood: lymphoma, including Hodgkin's disease TD (Intraarterial-Woman) 2 gm/kg; Tumorigenic: Carcinogenic by RTECS criteria, tumors at site of application TD (Intraarterial-Human) 1302 mg/kg; Tumorigenic: Carcinogenic by RTECS criteria; Liver: tumors, angiosarcoma **Skin corrosion or irritation / Serious eye damage or irritation / Respiratory or skin sensitization / Germ cell mutagenicity / Reproductive toxicity / Specific target organ toxicity – single exposure / Specific target organ toxicity – repeated exposure:** Not classified **Carcinogenicity:** Overall Evaluation of welding fumes , Titanium Dioxide, Nickel is listed by IARC as possibly carcinogenic to humans (Group 2B). Arc Rays can injure eyes and burn skin. Skin cancer has been reported **Information on the likely routes of exposures: Ingestion** is not a likely route of exposure for this product or expected under normal use. If swallowed call physician immediately! Do not induce vomiting unless directed by medical personnel. Rinse mouth with water if person is conscious. Never give fluids or induce vomiting if person is unconscious, having convulsions, or not breathing. **Inhalation** of welding fumes and gases can be dangerous to your health. **Skin/Eye Contact:** Arc Rays can injure eyes and burn skin. Skin cancer has been reported. **International Agency for Research on Cancer IARC-** has classified welding fumes, Titanium dioxide & Nickel as a possible carcinogenic to humans (Group 2B). **Quartz & Chromium (IV)** evaluation as carcinogenic to humans (Group1). **Calcium Fluoride & Chromium oxides** evaluation, not classified as to carcinogenicity to humans (Group 3). **THORIUM OXIDE**, a component of some of these products, is listed by IARC as a Group 1 compound (Carcinogenic to Humans - Sufficient Evidence of Carcinogenicity). **National Toxicology Program (NTP)** list Nickel with Reasonably Anticipated to be a Human Carcinogen; **Quartz & Chromium (IV)** known to be human carcinogen. Known to be human carcinogen (Thorium dioxide) **OSHA Specifically Regulated Substances Chromium (IV) Cancer;** Symptoms related to physical, chemical and toxicological characteristics: **Inhalation: Chromium (IV)** and compounds pose a cancer risk to humans; liver damage, allergic and skin rash have been reported. Nickel and compounds pose a respiratory cancer risk, and may give skin itch to dermatitis. Short-term (acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, dryness or irritation of nose, throat, or eyes. Pre-existing respiratory issues may be aggregated. Long-term (chronic) over-exposure to welding fumes can lead to siderosis (iron deposits in lung) and is believed to affect pulmonary function. Manganese and Manganese compounds above safe exposure limits can affect or cause irreversible damage to the central nervous system, including the brain: symptoms may result in impaired speech and movement, lack of energy, stiffness in legs, feet, toes, muscular weakness as well as psychological disturbances. Reports of bronchitis and lung fibrosis have also been noted. Copper and copper alloy compounds has effects with GASTRO-INTESTINAL system. **Symptoms related to physical, chemical and toxicological characteristics: Inhalation:** Short-term(acute) overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, dryness or irritation of nose, throat, or eyes. Pre-existing respiratory issues may be aggregated. Long-term (chronic) over-exposure to welding fumes can lead to siderosis (iron deposits in lung) and is believed to affect pulmonary function. Manganese and Manganese compounds above safe exposure limits can affect or cause irreversible damage to the central nervous system, including the brain: symptoms may result in impaired speech and movement, lack of energy, stiffness in legs, feet, toes, muscular weakness as well as psychological disturbances. Reports of bronchitis and lung fibrosis have also been noted. **Delayed and immediate effects and also chronic effects from short and long-term exposure:** There are no immediate health hazards associated with these rods of this product. Skin, respiratory, pancreas, and liver disorders may be aggravated by prolonged over-exposures to the dusts or fumes generated by these products. Pre-existing respiratory issues may be aggregated. Long-term (chronic) over-exposure to welding fumes can lead to siderosis (iron deposits in lung) and is believed to affect pulmonary function. Manganese and Manganese compounds above safe exposure limits can affect or cause irreversible damage to the central nervous system, including the brain: symptoms may result in impaired speech and movement, lack of energy, stiffness in legs, feet, toes, muscular weakness as well as psychological disturbances. Reports of bronchitis and lung fibrosis have also been noted. Treat symptoms and eliminate overexposure. **Other information during use: Inhalation acute toxicity:** Carbon dioxide LC Lo (Human, 5 min): 90000 ppm Carbon monoxide LC 50 (Rat, 4 h): 1,300 mg/l Nitrogen dioxide LC 50 (Rat, 4 h): 88 ppm; Ozone LC Lo (Human, 30 min): 50 ppm

SECTION XII- ECOLOGICAL INFORMATION

Ecotoxicity: Very Toxic to Aquatic life **Persistence and Degradability / Bioaccumulative Potential / Mobility in Soil:** No data **Specified substance(s):** Nickel Zebra mussel (Dreissana polymorpha), Bioconcentration Factor (BCF): 5,000 – 10,000 (lotic) Biocentration factor calculated using dry weight tissue concentration: Repeated exposure May cause damage to organs through prolonged or repeated exposure **Algae/aquatic plants EC50;** > 17.7 mg/l 72 h Pseudokirchneriella subcapitata; **Fish EC50** > 181 mg/l 96 h Danio rerio; **Crustacea EC50** > 163 mg/l 48 h Daphnia magna **Other Adverse Effects:** Possibly harmful to aquatic life. Do not allow material to be released to the environment without proper governmental permits. No further relevant information available.

SECTION XIII- DISPOSAL CONSIDERATIONS

Disposal Methods: Avoid or minimize generating waste. When possible collect scrap and by-products with proper id for recycling. Waste disposal must be in accordance with appropriate Federal, National, Provincial, State, and local regulations. These products, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

SECTION XIV- TRANSPORT INFORMATION

UN Number / UN Proper shipping name / Transport Hazard class (es)/ Packing group / Marine pollutant / Special Precautions: Not Regulated as Dangerous Good or Not Regulated, No international regulations

SECTION XV- REGULATORY INFORMATION

United States: TSCA INVENTORY STATUS: The components of these products are listed on the TSCA Inventory; **CERCLA REPORTABLE QUANTITY (RQ):** Copper = 5000 lbs. (for particulates less than 100 micrometers in size). Nickel = 100 lbs. Chromium and Chromium compounds or alloys 5000 lbs. Manganese & Cobalt = Reportable quantity: Included in the regulation but with no data values. See regulation (40 CFR 302.4).

EPCRA/SARA Title III 313 Toxic Chemicals Listed on SARA Section 313 (Specific toxic chemical listings) Tungsten, Cerium Oxide, Lanthanum Oxide, Thorium Oxide, Zirconium Oxide, Yttrium Oxide. **Superfund Amendments and Reauthorization Act 1986 (SARA):** As shipped: Immediate (Acute) In use: Immediate, delayed

California Proposition 65: These products may contain or produces chemicals known to the State of California to cause cancer, and/or birth defects (or other reproductive harm). (Health and Safety Code section 25249.5 et seq.) Thorium Dioxide is on the California Proposition 65 lists.

US State Regulations list: See Section III for contents and weight percent

Alaska-Designated Toxic and Hazardous Substances: Tungsten

California-Permissible Exposure Limits for Chemical Contaminants: California Proposition 65 - Thorium Dioxide listed, Tungsten

Florida-Substance List: Thorium Dioxide, Tungsten, Zirconium.

Illinois-Toxic Substance List: Thorium Dioxide, Tungsten.

Kansas-Section 302/313 List: Thorium Dioxide

Massachusetts- Right to Know List: Cerium Dioxide, Lanthanum Dioxide, Tungsten, Thorium Dioxide, Yttrium Oxide and Zirconium.

Michigan - Critical Materials Register:

Minnesota-List of Hazardous Substances: Cerium Dioxide, Lanthanum Dioxide, Tungsten, Thorium Dioxide, Yttrium Oxide and Zirconium.

Missouri-Employer Information/Toxic Substance List: Tungsten, Zirconium.

New Jersey-Right to Know Hazardous Substance List; Cerium Dioxide, Lanthanum Dioxide, Tungsten, Thorium Dioxide, Yttrium Oxide and Zirconium.

North Dakota-List of Hazardous Chemicals, Reportable Quantities:

Pennsylvania-Hazardous Substance List: Cerium Dioxide, Lanthanum Dioxide, Tungsten, Thorium Dioxide, Yttrium Oxide and Zirconium.

Rhode Island-Hazardous Substance List: Tungsten, Thorium Dioxide and Zirconium.

Texas-Hazardous Substance List:

West Virginia-Hazardous Substance List:

Wisconsin-Toxic and Hazardous Substances:

SECTION XVI- OTHER INFORMATION

Approval Date: 11-29-2017 NEW SDS Number: 027 Tungsten ELECTRODES

HMIS® ratings Health: 2 Flammability: 0 Physical hazard: 0

NFPA CODES: FIRE: 0 HEALTH: 2 REACTIVITY: 0

U.S. DOT = Material is not hazardous and is not considered as a dangerous item.

Washington Alloy Co. Believes that the information contained in this (SDS) Safety Data Sheet is accurate. However,

Washington Alloy Co. does not express or implies any warranty with respect to this information.

Download the most current SDS and product information @ www.weldingwire.com

