MATERIAL SAFETY DATA SHEET (MSDS)

For Welding Consumables and Related Products
Conforms to OSHA Hazard Communication Standard 29CFR 1910.1200
Standard Must Be Consulted for Specific Requirements

SECTION I – IDENTIFICATION

Manufacturer/Supplier: TORCHMASTER AUSTRALIA PTY LTD		Telephone No:(08)9303 9744	
Address: PO Box 1268,Wangara DC WA 6947 Unit 2,45 Inspiration Drive Wangara WA 6065,AUSTRALIA		Emergency No: (08)9303 9742	
Trade Name:	Specification:	Classification:	AWS Color Id
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 Tungsten WG	AWS A5.12 (ISO 6848)	**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**(WG)	Green (formerly Orange) Grey Black Gold Blue Yellow Red Brown White Purple

SECTION II
HAZARDOUS INGREDIENTS/Identity Information

IMPORTANT: This section covers the materials from which the product is manufactured. The fumes and gases product during welding with the normal use of this product are covered under Section V. The term "HAZARDOUS MATERIALS" should be interpreted as a term required and defined in OSHA HAZARD COMMUNICATIONS STANDARD 29 CFR 1910.1200 however the use of this term does not necessarily imply the existence of any hazard.

Ingredients of The Product	CAS No.	Exposure Limit (mg/m3)			
		OSHA PEL		ACGIH TLV	
Tungsten (W)	7440-33-7	5.0 ,10.0**	5.0 ,10.0**		
Thorium Dioxide (ThO2)(1)	1314-20-1				
Zirconium Oxide (ZrO2)	1314-23-4	5.0 ,10.0**	5.0 ,10.0**		
Cerium Dioxide (CeO2)	1345-13-7				
Lanthanum Dioxide (LaO2)	1312-81-8				
Chemical Composition Weight %					
	W	CeO2	LaO2	ThO2	ZrO2
Pure Tungsten	99.5(Min.)				
2% Ceriated Tungsten	Balance	1.8-2.2			
1% Lanthanated Tungsten	Balance		0.8-1.2		
1.5% Lanthanated Tungsten	Balance		1.3-1.7		
2% Lanthanated Tungsten	Balance		1.8-2.2		
1% Thoriated Tungsten	Balance			0.8-1.2	
2% Thoriated Tungsten	Balance			1.7-2.2	
Zirconated Tungsten	Balance				0.15-0.50
Zirconated Tungsten Zr-8	Balance				0.7-0.9

Other elements or ingredients may be present but in quantities much less than 1%.(1) Subject to reporting requirements of Section 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 Impurities = 0.5 max.

SECTION III -PHYSICAL DATA

As shipped these are solid rods that are nonflammable, non-explosive, non-reactive and non–hazardous –that are bare metal silver-gray hard and brittle electrodes

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Non-Flammable: Welding arc and sparks can ignite combustibles. Finely divided powers are flammable and may ignite if exposed to static electric discharge. See Z-49.1 referenced in Section XIII.

SECTION V – REACTIVITY & STABILITY DATA

Hazardous Decomposition Products

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. 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 II, 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 II, plus those from the base metal, coating and the other factors noted above. Reasonable expected fume constituents of this product may include: Complex oxides of aluminum, iron, manganese, silicon, sodium, potassium, nickel, calcium, and copper. Fluorides will also be present.

Gaseous reaction products may include carbon monoxide and carbon dioxide Ozone and nitrogen oxides may be formed by the radiation from the arc. Normally stable however Thorium oxides may undergo radioactive decay. One method of determining the composition and quantity of the fumes and gases to which the workers are exposed is to take an air sample from inside the welder's helmet while worn or within the worker's breathing zone. See ANSI/AWS F1.1 publication available from the American Welding Society 550 N.W. LeJeune Road, Miami, Florida 33126.

Stability: As shipped these products are stable.

SECTION VI– ENTRY DATA

Common Entry: During the welding processes inhalation of welding fumes may give the most common route of over exposure as well as the dust from the grinding process. Contact with skin, eyes, ingestion or injection should not be a source for exposure with proper protection.

SECTION VII– Threshold Limit Value

The ACGIH recommended general limit for welding fume NOC (Not otherwise classified) is 5 mg/m3. ACGIH-1985 preface states: "The TLC-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations." Read all other sections for specific fume constituents, which may modify this TLV.

SECTION VIII– HEALTH HAZARD DATA

Effects of Overexposure: Inhalation of welding fumes and gases can be dangerous to your health. Short-term (acute) overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat, or eyes. Chromium (VI) compounds present in the fume may cause abdominal pain, diarrhea, muscular weakness and convulsions. Continued inhalation could cause loss of consciousness and death. Chromium (VI) compounds present in the fume may cause severe irritation of the bronchial tubes and lungs. Ingesting Chromium (VI) salts may cause injury of death. Chromium (VI) compounds may burn eyes. Chromium compounds may cause allergic reactions in some people. Nickel oxides present in the fume may cause tightness around the chest, fever and allergic reactions in some people. Long-term (chronic) over-exposure to welding fumes can lead to siderosis (iron deposits in lung) and is believed to affect pulmonary function. Repetitive exposure to fluoride fumes and/or gases may cause excessive calcification of the bones and ligaments of the ribs, pelvis and spinal column. Constant inhalation of chromium (VI) compounds may cause an ulceration and perforation of the nasal septum as well as liver and kidney damage. Repetitive overexposure to nickel oxides may lead to lung fibrosis or pneumoconiosis. Workers exposed to chromium (VI) compounds and/or nickel oxides have a higher incidence of lung and nasal cancers. Chromium and nickel compounds are on the IARC (International Agency for Research of Cancer) list as posing a carcinogenic risk to humans. Arc Rays can injure eyes and burn skin. Electric shock can kill. Carcinogenicity & California Proposition 65 listed in Section X. Special precautions must be taken during the grinding, machining or weld working when using electrodes containing Thorium due to the generation of dust or fumes.

SECTION IX-Emergency and First Aid Procedures

Remove to fresh Air. Call for medical assistance. Use first aid procedures recommended by the American Red Cross. If breathing is difficult or not breathing – give oxygen or use CPR (cardiopulmonary resuscitation) by trained personnel. Consult a physician if irritation of the eyes and skin or flash burns develops after exposure.

SECTION X-TOXICOLOGICAL INFORMATION

Acute toxicity: 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 other lung disease.
Chronic toxicity: Overexposure or prolonged inhalation of large amounts of welding fumes with chromium compounds may cause cancer. Other overexposure or prolonged inhalation of large amounts of welding fumes symptoms related may include damage to the central nervous system, respiratory system, skin and could affect organs such as pancreas and liver
Carcinogenicity OSHA (29 CFR 1910.1200) lists Nickel and Chromium as possible carcinogens. Thorium oxide has been identified as a carcinogen by NTP, IARC and others.
California Proposition 65 Thorium oxide is listed on 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.)

SECTION XI –SAFE HANDLING AND STORAGE

Handling: Do not eat or drink while using these products and ensure proper ventilation is used. Always wash all exposed skin thoroughly and ensure good house keeping. 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.

SECTION XII –DISPOSAL & WASTE

Waste Disposal Method: Recycle when possible. Discard any un-wanted product, residues, containers, or liners in a suitable disposal container in an environmentally acceptable manner approved by Federal, State and Local regulations.

SECTION XIII– CONTROL MEASURES AND PERSONAL PROTECTION

Read and understand the manufacturer's instructions and precautionary label on this product and your employer's safety practices. See 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 for more details on the following topics.
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 or any dust during the grinding of electrode tips.
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.
Eye Protection: Wear a helmet or face shield with a filter lens shade number 12-14 or darker. Shield other workers by providing screens and flash goggles.
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.

SECTION XIV– OTHER INFORMATION

Approval Date: 11-19-2010
NFPA CODES : FIRE: 0 HEALTH: 1 REACTIVITY: 0
Washington Alloy Co. Believes that the information contained in this (MSDS) Material Safety Data Sheet is accurate. However, Washington Alloy Co. does not express or implies any warranty with respect to this information.
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