Conforms to ANSI Z400.1-2004 Standard

Material Safety Data Sheet

E3 Tungsten Electrodes

1. Product and company identification

Product name : E3 Tungsten Electrodes

Material uses : Welding, cutting metal working. This product is designed to be used as a non-melting electrode for Arc welding and cutting processes.

Supplier/Manufacturer : Astaras Welding Accessories
6901 Bryan Dairy Rd. Unit #160
Largo, FL 33777
Tel : (727) 546-9600
Fax : (727) 546-9699

AWS Specification : AWS A5.12M/A5.12:2009 (EWG)
98.34% W + 1.5% La_2O_3 + 0.08% ZrO_2 + 0.08% Y_2O_3

MSDS authored by : KMK Regulatory Services Inc.

In case of emergency : CHEMTREC, U.S. : 1-800-424-9300 International: +1-703-527-3887

2. Hazards identification

Emergency overview

Physical state : Solid. [Bar]

Color : Metallic grey.

Odor : Odorless.

Signal word : WARNING!

Hazard statements : MAY CAUSE EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

The fumes emitted by the electrodes, in use, are hazardous. This MSDS is written for workers using these electrodes.These hazards relate to welding fumes (electrodes in use) and not to the electrodes as sold.

Precautionary measures : Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential acute health effects

Inhalation : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Skin : Slightly irritating to the skin.

Eyes : Dust particules or fumes may cause eye irritation.

Potential chronic health effects

Chronic effects : Contains material that can cause target organ damage.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Target organs : Contains material which may cause damage to the following organs: blood, upper respiratory tract, skin, eyes.

Over-exposure signs/symptoms

Inhalation : No specific data.

Ingestion : No specific data.

2. Hazards identification

Skin : Adverse symptoms may include the following:
irritation
redness

Eyes : Adverse symptoms may include the following:
irritation
watering
redness

Medical conditions aggravated by overexposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
Tungsten	7440-33-7	98.2 - 98.48
Lanthanum oxide	1312-81-8	1.3 - 1.7
Zirconium dioxide	1314-23-4	0.06 - 0.10
Yttrium oxide	1314-36-9	0.06 - 0.10

Canada

Name	CAS number	%
Tungsten	7440-33-7	98.2 - 98.48
Lanthanum oxide	1312-81-8	1.3 - 1.7
Zirconium dioxide	1314-23-4	0.06 - 0.10
Yttrium oxide	1314-36-9	0.06 - 0.10

Mexico

					Classification			
Name	CAS number	UN number	%	IDLH	H	F	R	Special
Tungsten	7440-33-7	Not regulated.	98.2 - 98.48	-	1	1	0	-
Lanthanum oxide	1312-81-8	Not regulated.	1.3 - 1.7	-	0	1	0	-
Zirconium dioxide	1314-23-4	Not regulated.	0.06 -0.10	50 mg/m³	0	0	0	-
Yttrium oxide	1314-36-9	Not available.	0.06 -0.10	500 mg/m³	0	0	0	-

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Eye contact : Immediately flush eyes with plenty of water for at least 20 minutes, occasionally lifting the upper and lower eyelids. Get medical attention if symptoms occur.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 20 minutes. Get medical attention if symptoms occur.

Inhalation : Move exposed person to fresh air.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Notes to physician : No specific treatment. Treat symptomatically.

5. Fire-fighting measures

Flammability of the product : Welding arcs and sparks can ignite combustibles. Refer to ANSI Z49.1 “SAFETY IN WELDING AND CUTTING” published by the American Welding Society for fire prevention and protection information during welding.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

5. Fire-fighting measures

Hazardous decomposition products : Tungsten exposed to air: from 500°C onwards oxidation to tungsten oxide WO_3. From 850°C onwards evaporation of built up tungsten oxides WO_3.

Special protective equipment for fire-fighters : No special protection is required.

6. Accidental release measures

Personal precautions : Provide adequate ventilation. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill : Vacuum or sweep up material and place in a designated, labeled waste container. Dispose via a licensed waste disposal contractor.

Large spill : Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

United States

Ingredient	Exposure limits
Tungsten	**ACGIH TLV (United States, 2/2010).** TWA: 5 mg/m³, (W) 8 hour(s). Form: Insoluble STEL: 10 mg/m³, (W) 15 minute(s). Form: Insoluble **NIOSH REL (United States, 6/2009).** STEL: 10 mg/m³, (W) 15 minute(s). TWA: 5 mg/m³, (W) 10 hour(s).
Tungsten oxide WO_3	**ACGIH TLV (United States, 2/2010).** STEL: 10 mg/m³, (as W) 15 minute(s). Form: Insoluble TWA: 5 mg/m³, (as W) 8 hour(s). Form: Insoluble **OSHA PEL 1989 (United States, 3/1989).** STEL: 10 mg/m³, (as W) 15 minute(s). Form: Insoluble TWA: 5 mg/m³, (as W) 8 hour(s). Form: Insoluble **NIOSH REL (United States, 6/2009).** TWA: 5 mg/m³, (as W) 10 hour(s). STEL: 10 mg/m³, (as W) 15 minute(s).
Lanthanum oxide	-
Yttrium oxide	**ACGIH TLV (United States, 2/2010).** TWA: 1 mg/m³, (as Y) 8 hour(s).
Zirconium dioxide	**ACGIH TLV (United States, 2/2010).** STEL: 10 mg/m³, (Zr) 15 minute(s). TWA: 5 mg/m³, (Zr) 8 hour(s). **NIOSH REL (United States, 6/2009).** STEL: 10 mg/m³, (Zr) 15 minute(s). TWA: 5 mg/m³, (Zr) 10 hour(s).

8. Exposure controls/personal protection

	OSHA PEL (United States, 6/2010). TWA: 5 mg/m³, (Zr) 8 hour(s).

Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredient	**List name**	**ppm**	**mg/m³**	**Other**	**ppm**	**mg/m³**	**Other**	**ppm**	**mg/m³**	**Other**	**Notations**
Yttrium oxide, as Y	US ACGIH 2/2010	-	1	-	-	-	-	-	-	-	
	AB 4/2009	-	1	-	-	-	-	-	-	-	
	BC 9/2010	-	1	-	-	-	-	-	-	-	
	ON 7/2010	-	1	-	-	-	-	-	-	-	
	QC 6/2008	-	1	-	-	-	-	-	-	-	
Zirconium dioxide, Zr	US ACGIH 2/2010	-	5	-	-	10	-	-	-	-	
	AB 4/2009	-	5	-	-	10	-	-	-	-	
	BC 9/2010	-	5	-	-	10	-	-	-	-	
	ON 7/2010	-	5	-	-	10	-	-	-	-	
	QC 6/2008	-	5	-	-	10	-	-	-	-	
Tungsten, W	US ACGIH 2/2010	-	5	-	-	10	-	-	-	-	[a]
	QC 6/2008	-	5	-	-	10	-	-	-	-	
	AB 4/2009	-	5	-	-	10	-	-	-	-	[3]
Tungsten	BC 9/2010	-	5	-	-	10	-	-	-	-	
Tungsten oxide WO_3, as W	US ACGIH 2/2010	-	5	-	-	10	-	-	-	-	[a]
	AB 4/2009	-	5	-	-	10	-	-	-	-	[3]
Tungsten oxide WO_3	BC 9/2010	-	5	-	-	10	-	-	-	-	
Tungsten oxide WO_3, as W	ON 7/2010	-	5	-	-	10	-	-	-	-	[b]

[3]Skin sensitization
Form: [a]Insoluble

Mexico

Occupational exposure limits

Ingredient	Exposure limits
Tungsten	**NOM-010-STPS (Mexico, 9/2000).** LMPE-CT: 10 mg/m³, (W) 15 minute(s). LMPE-PPT: 5 mg/m³, (W) 8 hour(s).
Tungsten oxide WO_3	**NOM-010-STPS (Mexico, 9/2000).** LMPE-CT: 10 mg/m³, (as W) 15 minute(s). LMPE-PPT: 5 mg/m³, (as W) 8 hour(s).
Lanthanum oxide	-
Yttrium oxide	**ACGIH TLV (United States, 2/2010).** TWA: 1 mg/m³, (as Y) 8 hour(s).
Zirconium dioxide	**NOM-010-STPS (Mexico, 9/2000).** LMPE-CT: 10 mg/m³, (Zr) 15 minute(s). LMPE-PPT: 5 mg/m³, (Zr) 8 hour(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : No special ventilation requirements. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Ensure that eyewash stations and safety showers are close to the workstation location. Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

Personal protection

Respiratory : Not required under normal conditions of use. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Use gloves appropriate for work or task being performed.

8. Exposure controls/personal protection

Eyes : Safety eyewear should be used when there is a likelihood of exposure. Recommended: Safety glasses with side shields.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Recommended: Lab coat.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

9. Physical and chemical properties

Physical state : Solid. [Bar]

Color : Metallic grey.

Odor : Odorless.

Boiling/condensation point : 5900°C (10652°F)

Melting/freezing point : 3400°C (6152°F)

Density : 19 to 19.1 g/cm^3

Solubility : Insoluble in water

10. Stability and reactivity

Chemical stability : The product is stable.

Conditions to avoid : No specific data.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products : Tungsten exposed to air: from 500°C onwards oxidation to tungsten oxide WO_3. From 850°C onwards evaporation of built up tungsten oxides WO_3.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

Acute toxicity : No specific data.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Tungsten	Eyes - Mild irritant Skin - Mild irritant	Rabbit Rabbit	- -	24 hours 500 mg 24 hours 500 mg	- -

IDLH : Not available.

Synergistic products : Not available.

12. Ecological information

Ecotoxicity : No known significant effects or critical hazards.

13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues.

13. Disposal considerations

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	Not regulated.	-	-	-		-
TDG Classification	Not regulated.	-	-	-		-
Mexico Classification	Not regulated.	-	-	-		-
IMDG Class	Not regulated.	-	-	-		-
IATA-DGR Class	Not regulated.	-	-	-		-

PG* : Packing group

Exemption to the above classification may apply.

AERG : Not applicable

15. Regulatory information

United States

HCS Classification : Target organ effects

U.S. Federal regulations :
TSCA 8(a) PAIR: Tungsten
TSCA 8(a) IUR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Tungsten
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Tungsten: Immediate (acute) health hazard, Delayed (chronic) health hazard

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

15. Regulatory information

State regulations

Massachusetts : The following components are listed: Tungsten

New York : None of the components are listed.

New Jersey : The following components are listed: Tungsten

Pennsylvania : The following components are listed: Tungsten

California Prop. 65

None of the components are listed.

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).

Canadian lists

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Mexico

Classification :

International regulations

International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: Not determined.
Korea inventory: All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.

16. Other information

Label requirements : MAY CAUSE EYE AND SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

The fumes emitted by the electrodes, in use, are hazardous. This MSDS is written for workers using these electrodes.These hazards relate to welding fumes (electrodes in use) and not to the electrodes as sold.

Hazardous Material Information System (U.S.A.) : **Health :** 1 * **Flammability :** 0 **Physical hazards :** 0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) : **Health :** 1 **Flammability :** 0 **Instability :** 0

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16. Other information

History

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Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.