



**MATERIAL
SAFETY
DATA SHEET**

Safety Data Sheet

Issue 31/08/06,

Tungsten Electrodes Thoriated

1. Identification of the Substance/Preparation and the Company/Undertaking

Substance or preparation trade name: Tungsten Thoriated

Company/undertaking name & address: Parweld Ltd, Long Bank, Bewdley, Worcs DY12 2TZ

Telephone: 01299 266800

Emergency telephone number: 01299 266800

2. Composition

Substance: W + ThO₂

% content: max 4% Thoria

CAS Number: 1314-20-1

Classification:

EC Number: 215-225-1

3. Hazards Identification

Most important hazards: According to the German regulation "BGBI. 1979, No. 125 Z1997A, 13. Oct. 1976" activity ingestion of Thorium-contaminated air of 4.8.10-10 Curie/year is permitted. References available at this time do not report toxicity or other adverse health effects are known.

Specific hazards:

Thorium is a naturally occurring radioactive element, emitting primarily alpha radiation. Its decay products emit both alpha and gamma radiation. NCR exposure limit for natural thorium in air is 2×10^{-12} micro curies per ml of air (9 micrograms per m³).

There are no recognized hazards associated directly with unused electrodes prior to grinding and welding. Packaged consumables may be heavy, and should be handled and stored with care. FOLLOW MANUAL HANDLING REGULATIONS.

Some very low levels of dust may be produced during handling. DO NOT BREATHE THE DUST. When preparing (grinding) and using these electrodes as part of the welding process additional potential hazards are likely:

GRINDING. Toxic dusts. ENSURE ADEQUATE DUST EXTRACTION, VENTILATION AND DUST DISPOSAL

WELDING. Electric shock from the welding equipment or electrode. This can be fatal. Hot metal spatter and heat, which can cause burns to the hand and body, and may cause fire if in contact with combustible materials. UV, IR and light radiation from the arc, which can produce 'arc eye' and possible eye damage to unprotected eyes. WEAR SUITABLE PROTECTIVE EQUIPMENT. Fumes produced from the electrodes, material being welded and the arc radiation: Particulate fume such as metal oxides from the electrodes, and complex metal oxides and silicates from the weld materials. Gaseous fume such as ozone and nitrogen oxides from the action of arc radiation on the atmosphere. SHORT TERM INHALATION OF THESE FUMES AND GASES MAY LEAD TO

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IRRITATION OF THE NOSE, THROAT AND EYES. LONG TERM OVEREXPOSURE OR INHALATION OF HIGH LEVELS OF FUMES MAY RESULT IN HARMFUL EFFECTS TO THE RESPIRATORY SYSTEM, CENTRAL NERVOUS SYSTEM AND LUNGS. LOCAL EXTRACTION AND /OR VENTILATION SHOULD BE USED TO ENSURE THAT ALL HAZARDOUS INGREDIENTS IN THE FUME ARE KEPT BELOW THEIR INDIVIDUAL OCCUPATIONAL EXPOSURE STANDARDS IN THE WELDER'S AND OTHER WORKERS' BREATHING ZONES. NOTE: If welding is performed on plated or coated materials such as galvanised steel, excessive fume may be produced which contains additional hazardous components, and may result in metal fume fever and other health effects.

4. First aid measures

If a person breathes in large amounts of dust, remove from exposure.
If material gets in eyes, flush particles from eyes with water.

5. Fire fighting measures

Extinguishing media: dry chemical, sand or Limestone

Unsuitable extinguishing media: Water

Special fire fighting procedures: Use a class D dry powder extinguisher recommended for metal fires. Wear self-contained breathing apparatus. After ignition source is removed, the metal may continue to glow until complete oxidation has occurred. Cover all exposed surfaces, do not disturb until completely extinguished and allowed to cool.

6. Accidental release measures

Steps to be taken in case material is spilled or released, provide clean-up employees with respirators for dusty conditions (grinding dust). Dampen down dust with water.

7. Handling and storage

When not in use, electrodes should be kept in a suitable store, the nature of which will depend upon the number of electrodes. For those holding up to a few hundreds of electrodes it may be most convenient to keep them in a metal cabinet or box since such a store would normally provide adequate shielding against external gamma radiation from bundles of electrodes. Those storing thousands of electrodes may find it more convenient to store them in a separate room. The shielding properties of the walls of the room will be more than adequate. Since the occupancy of a separate room should be very low, metal cabinets within the room would not be necessary. The number of electrodes in store should be kept to a minimum, taking account of expected usage and availability of further stock from manufacturers/suppliers.

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8. Exposure Controls

Personal protection:

Respiratory protection: During grinding of these electrodes, toxic and radioactive dusts may be produced. Ensure adequate dust extraction, ventilation and dust disposal during and after grinding to prevent contamination of operators and co-workers. During welding, fumes and gases will be produced and emitted from the welding process. The content of the fume is dependent on the electrode and base material being welded. The amount and concentration of fume generated is dependent on factors such as current, voltage, welding practices and number of welders in a given area. By following recommended welding practices, fume production can sometimes be minimised. When welding with the tungsten electrodes covered by this Data Sheet, the fume will consist of tungsten oxide from the electrodes, and may contain Thorium oxides, and other complex metal oxides and silicates from the material being welded. Gaseous ozone and nitrous oxides are also formed by arc radiation. In some cases ozone levels can be high and additional controls may be needed. The individual exposure limits (when specified) for the constituents mentioned above are given below. Fume exposure should be controlled to below the recognised exposure limit for each of the individual constituents, and to below 5 mgm/m³ for the total particulate fume.

Welding fume component	CAS No.	OEL18hrTWA	STEL115minTWA
Total welding fume (particulate)- Tungsten and compounds (as W)		5	
Soluble	7440-33-7	1	3
Insoluble		5	10

9. Physical and chemical properties

Condition: solid

Appearance: steel-grey to black metal

Odour: no odour

Boiling point: 5900 C (6173 K)

Vapour pressure: not volatile

Vapour density: not volatile

Solubility of water: insoluble

Density: 19.3 g/cm³

Percent, volatile by volume 0

Evaporation rate: not volatile

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10. Stability and reactivity

Stability Stable

Incompatibility: None known

Hazardous decomposition products: WO₃- vapour at high temperatures (>800 C,1073k)
not toxic: Th and ThO₂ fume weakly radioactive

Hazardous polymerisation: will not occur element, emitting primarily alpha radiation. Its decay products emit both alpha and gamma radiation. NCR exposure limit for natural thorium in air is 2 x 10⁻¹² micro curies per ml of air (9 micrograms per m³).

11. Toxicological information

Excessive exposure may affect human health as follows:

Skin contact: None

Eye contact: None

Inhalation/ingestion: May lead to problems related to ingestion of radioactive material

Thorium should be treated as suspected carcinogens which may cause adverse mutagenic effects, especially when in an untreated form.

12. Ecological information

Thoriated Tungsten has no known detrimental ecological effect. Its stability means it will remain within an ecosystem for a very long time without degradation.

13 Disposal Considerations

The spent tips and dust from the grinding should be disposed of in a sealed container to a landfill disposal site. The external dose rate from the dust collected following grinding is very low. The thorium is diluted by a relatively large amount of inactive material and a container made from a material such as plastic will be adequate with regard to its shielding properties for external radiation. The container should be sealed to prevent the spread of dust; adhesive tape is adequate.

14. Transport information

No special transport requirements

15. Regulatory information

None

16. Other Information

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