Safety Data Sheet (SDS)

ELMET TECHNOLOGIES
Your Edge in Performance Metals

SECTION 1 – CHEMICAL IDENTIFICATION

1.1 Product Names: Tungsten Heavy Alloy
Other Identifiers: High Density Tungsten Alloy, Tungsten-Nickel-Iron Heavy Alloy

1.2 Supplier:
Elmet Technologies, LLC
1560 Lisbon Street
Lewiston, Maine 04240
(207) 333-6210

1.3 Emergency Telephone # (207) 333-6100

SECTION 2 – HAZARDS IDENTIFICATION

2.1 GHS Classification

2.2 GHS Signal Word
WARNING

2.3 GHS Hazard Statements
H313 – May be harmful if contact with skin.
H320 – Causes eye irritation.

2.4 GHS Precautionary Prevention Statements
P264 – Wash hands thoroughly after handling.
P271 – Use only outdoors or in a well ventilated area.
P303+P352 – If on skin: Wash with plenty of soap and water
P305+P351+P338 – If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy.
P332+P313 – If skin irritation occurs: Get medical advice/attention.
P337+P313 – If eye irritation persists. Get medical advice/attention.
P370+P378 – In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Primary Routes of Entry: Skin or eye contact.
Hazard Notes: Although Tungsten Heavy Ally is a solid, grinding or shaping of the solid can cause dust, and it is this dust that could cause skin or eye irritation. As solid compound, tungsten heavy alloy presents no significant health risks.

SECTION 3 – CHEMICAL COMPOSITION/INGREDIENTS

3.1 Chemical Composition:

Material	Percent %	OSHA PEL (mg/m3)	ACGIH TLV (mg/m3)	ACGIH STEL (mg/m3)
Tungsten	70 – 99.5	5 insoluble 1 soluble	6 insoluble 1 soluble	10 insoluble 3 soluble
Nickel	0 – 21	1 insoluble 1 soluble	1 insoluble 0.1 soluble	NA
Iron	0 – 9	NA	NA	NA

Chemical Family: Refractory Metal Alloy
Chemical Formula: W+Ni+Fe

SECTION 4 – FIRST AID MEASURES

4.1 **SKIN CONTACT:** Remove contaminated clothing, brush material off skin, and wash affected area well with soap and water. Launder before use. Seek medical attention if symptoms persist.
EYE IRRITATION: Flush eyes with clean, lukewarm water for 15 minutes. Obtain medical attention if irritation develops.
Seek medical attention if symptoms persist.
DUST INHALATION: Remove victim to fresh air, keep warm and quiet, give oxygen if breathing is difficult and seek medical attention if symptoms persist.
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY LONG TERM EXPOSURE: Pre-existing respiratory disorders

SECTION 5 – FIRE FIGHTING MEASURES

5.1 Suitable Extinguishing Media:
Class D Fire Extinguisher (Dry Powder)

5.2 Firefighting Procedures:
For a fire confined to a small area, use a respirator approved for toxic dusts and fumes. For a large fire involving this material, firefighters must wear a self contained breathing apparatus.

5.3 Unusual Fire/Explosion Hazards:
Dust may present a fire or explosion hazard under favorable conditions of particle size, dispersion and a strong ignition source. However, under normal handling conditions, this is not expected to be a problem.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions:
Ventilate area of spill. Take care not to raise dust. Use non-sparking tools. Clean up using methods which avoid dust generation such as vacuuming (with appropriate filter to prevent airborne dust

levels which exceed the TLV), wet dust mop or wet clean up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

6.2 Environmental Precautions:
Dispose of in accordance with local, state and federal regulations.

SECTION 7 – HANDLING AND STORAGE

7.1 Precautions for Safe Handling:
In general, tungsten heavy alloys are safe materials to handle and use in almost all commonly encountered environments. Special precautions typically only apply in situations where dust is created as a byproduct of handling.

Maintain good housekeeping procedures to avoid accumulation of dust. Use clean-up methods which minimized dust generation such as vacuuming and wet clean up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Wash thoroughly after handling and before eating or smoking and at the end of the work shift. Do not shake clothing or other items to remove dust, use a vacuum. Avoid dust inhalation and direct skin contact. Do not ingest especially small pieces.

7.2 Conditions for Safe Storage:
Store in a controlled environment.

SECTION 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 Engineering Controls:
Use local exhaust ventilation, which is adequate to limit personal exposure levels that do not exceed the TLV. If such equipment is not available use respiratory protection as specified below.

8.2 Personal Protective Equipment:
Respiratory Protection:
Use a NIOSH approved respirator when airborne dust concentrations exceed the TLV. See (29 CFR 1910.134)
Eye Protection:
Wear safety glasses or goggles.
Skin Protection:
Wear nitrile or rubber gloves.
Additional Protection:
Provide eyewash station and washing facilities accessible to areas of use and handling.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Gray Metal Solid
Odor: None
pH: N/A
Melting point: 6,170 °F (3,410 °C)
Boiling point: 10,220 °F (5,660 °C)

Flash point: N/A
Evaporation rate: N/A
Flammability: Only flammable as dust.
LEL (%): N/A
UEL (%): N/A
Solubility in water: Insoluble
Relative Density: 17 – 18.5 g/cc
Auto-ignition temperature: N/A

SECTION 10 – STABILITY AND REACTIVITY

10.1 Stability:
Stable

10.2 Incompatibility (materials to avoid):
Avoid contact with strong oxidizers: Bromide pentafluoride, bromine, chlorine trifluoride, potassium perchlorate, potassium dichromate, nitryl fluorine, fluorine, oxygen diflouride, iodine pentafluoride, hydrogen sulfide, sodium peroxide, lead (IV) oxide, air. Extremely fine powders may be pyrophoric under certain conditions.

10.3 Hazardous Decomposition Products:
None.

10.4 Hazardous Polymerization:
Will not occur.

10.5 Waste Disposal Method:
Reclaim; remove to waste disposal facility operating in compliance with federal, state, or local environmental control regulations.

SECTION 11 – TOXICOLOGICAL INFORMATION

TUNGSTEN: To the best of our knowledge, the chemical physical & toxicological properties of tungsten metal have not been thoroughly recorded. Tungsten compounds: Industrially, this element does not constitute an important health hazard. Exposure is related mainly to the dust arising from the crushing & milling of the two chief ores of tungsten, namely scheelite & wolframite. Large overdoses cause central nervous system disturbances, diarrhea, respiratory failure and death in experimental animals.

NICKEL: As an element, nickel is an IARC 2B and NTP 2 carcinogen, i.e. it is *possibly* carcinogenic to humans, but there is limited evidence in humans in the absence of sufficient evidence in experimental animals.

IRON: Only iron dust is a health hazard. When inhaled in large amounts, iron dust may cause pneumoconiosis (arc welder's lung). Iron dust is not a concern when using this alloy as a solid.

COMPOUNDS: Tungsten compounds are considered somewhat toxic. However, elemental tungsten does not constitute an important health hazard. Exposure is related chiefly to any dust created.

The feeding of 2, 5 and 10%of diet as tungsten metal over a period of 70 days has shown no marked effect upon the growth of rats, as measured in terms of weight gain. Nickel and many of its compounds are poisons and carcinogens. All airborne nickel contaminating dusts are regarded as carcinogenic by inhalation. Ingestion of large doses of nickel compounds (1-3mg/kg) has been shown to cause intestinal disorders, convulsions and asphyxia. Hypersensitivity to nickel is common and can cause allergic dermatitis, pulmonary asthma and conjunctivitis. The most common effect resulting from exposure to nickel compounds is the development of nickel contact dermatitis (or "nickel itch"). As noted above, the inhalation of large amounts of iron dust may result in iron pneumoconiosis (arc welder's lung). Chronic exposure to excess levels of iron (> 50-100mg Fe/day) can result in pathological deposition of iron in the body tissues, the symptoms of which are fibrosis of the pancreas, diabetes mellitus and liver cirrhosis.

SECTION 12 – ECOLOGICAL INFORMATION

12.1 Environmental Fate:
Tungsten is not ecotoxic. Generally not hazardous to water.

12.2 Environmental Toxicity:
No data available.

12.3 Persistence and Degradability:
Will convert to tungsten oxide during prolonged contact with water.

12.4 Mobility in Soil:
No data available.

SECTION 13 – DISPOSAL CONSIDERATIONS

The material must be disposed of in accordance with any and all local, state and federal regulations. Material intended for disposal may be sold as scrap for reclamation purposes.

SECTION 14 – TRANSPORT INFORMATION

14.1 U.S. Department of Transportation (DOT)

DOT Transportation Data: (49 CFR 172.101)
Hazard Class: None
Label: No class label assigned
Shipping Name: Tungsten Alloy
Packing Group: None

SECTION 15 – REGULATORY INFORMATION

15.1 US Federal Regulations

Canadian DSL Inventory: Listed
RCRA Hazardous Waste Number: Not listed.

SARA Title III: Under applicable definitions this material may meet the criteria for the delayed (chronic) health hazard category.
SARA Section 313: Tungsten is not subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372. However, Nickel may be subject to the reporting requirements of this section of SARA if its deminimis concentration exceeds 0.1 percent. See 40 CFR 372 for reporting requirements.
CERCLA: Reporting for releases of this product to the environment is not required.
DOT: Not regulated.
TSCA: This product is listed on the US Toxic Substances Control Act (TSCA) Inventory.

SECTION 16 – OTHER INFORMATION

16.1 **Disclaimer:** The information contained herein is accurate to the best of our knowledge. Elmet Technologies, LLC makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances.