



DEFENSE LOGISTICS AGENCY
DEFENSE NATIONAL STOCKPILE CENTER
8725 JOHN J. KINGMAN ROAD, SUITE 3229
FT. BELVOIR, VIRGINIA 22060-6223

September 7, 2006

AMENDMENT NO. 004
TO
SOLICITATION OF OFFERS FOR
FERROTUNGSTEN AND TUNGSTEN METAL POWDER
UNDER
DLA-FERROTUNGSTEN AND TUNGSTEN METAL POWDER-003

The above referenced Solicitation for the sale of Ferrotungsten and Tungsten Metal Powder is hereby amended to schedule an offering for fiscal year 2006 and 2007, revise the listing of available material, and update various sections of the Solicitation, as follows:

1. Section **A.1 Introduction (OCT 05)** is hereby deleted in its entirety and replaced with the following:

A.1 Introduction (SEP 06)

- a. The Defense Logistics Agency (DLA), Defense National Stockpile Center (DNSC), is soliciting offers for the sale of approximately 591,733 lbs W of Tungsten Metal Powder in Fiscal Years 2006 and 2007 as follows:

| <u>Commodity</u> | <u>FY 2006</u> | <u>FY 2007</u> |
|-----------------------|----------------|----------------|
| Tungsten Metal Powder | 300,000 lbs W | 291,733 lbs W |

In the event a contract with options for future years is awarded, quantities will be set by execution of supplemental agreements. The execution of supplemental agreements under this solicitation is dependent upon sales authority for the commodity and quantities for those fiscal years.

The offering for **Tungsten Metal Powder and Fabricated Tungsten Materials** will be held on **Tuesday, September 19, 2006, at 2:00 pm** local time, Fort Belvoir, VA.

Offers must be received at the address in Section B.2.a. by 2:00 pm, local time, Fort Belvoir, VA. In the event that DNSC is closed at that time, offers for that day will be received at 2:00 pm on the next DNSC business day.

- b. Delivery of any and all Tungsten is F.O.B. carrier's conveyance. (See Sections F.1.d. and F.1.e.)
2. Section **A.5 Wood Packaging Materials Requirements (JUN 06)** is hereby added to Section A.

A.5 Wood Packaging Materials Requirements (JUN 06)

Wood packaging materials utilized in the storage and shipment of National Defense Stockpile materials, including, but not limited to, pallets, boxes, kegs, and dunnage lumber, do not meet the requirements of U.S. Department of Agriculture Regulations at 7 CFR 319.40 or International Standards for Phytosanitary Measures (ISPM) 15, "Guidelines for Regulating Wood Packaging Materials in International Trade." Stockpile wood packaging materials have not been heat treated or fumigated with methyl bromide and are not marked to indicate that they meet the requirements of these regulations and standards. As a result, it may not be possible to export or import these wood packaging materials.

3. Section **I.2 Item Offer Page –Tungsten Metal Powder(Carbon- & Hydrogen-Reduced Powder, Fabricated Materials) (AUG 05)** is hereby deleted in its entirety. Section **I.2** will be posted on the DNSC Website and can be accessed here by clicking on the link provided.

[Item Offer Page –Tungsten Metal Powder
Analysis of Tungsten Metal Powder](#)

4. Section **J.1 Tungsten Metal Powder(Carbon- & Hydrogen-Reduced Powder + Fabricated Materials) (AUG 05)** is hereby deleted in its entirety. Section **J.1** will be posted on the DNSC Website and can be accessed here by clicking on the link provided.

[Item Offer Page –Tungsten Metal Powder
Analysis of Tungsten Metal Powder](#)

5. Section **J.5 Material Safety Data Sheet – Tungsten Metal Powder** is hereby deleted in its entirety and replaced with the attached Section **J.5 Material Safety Data Sheets – Tungsten Metal Powder-VariouS (JUN 06), and Tungsten Metal Scrap (JUN 06)**

6. Except as provided herein, all other terms and conditions of **DLA-FERROTUNGSTEN AND TUNGSTEN METAL POWDER-003**, as amended by Amendment No. 002 and 003 thereto, remain unchanged and in full force and effect.

7. Offerors shall acknowledge receipt of this Amendment by signing in the space provided below and returning a copy of this form along with their offer to:

ATTN: DNSC-R/Bid Custodian
Defense National Stockpile Center
8725 John J. Kingman Road
Suite 3229
Fort Belvoir, VA 22060-6223
Facsimile No. (703) 767-5541

Failure to acknowledge receipt of this Amendment may result in the offeror being considered ineligible for award.

NAME OF FIRM: _____

ADDRESS: _____

TELEPHONE: _____

FACSIMILE: _____

BY: _____

SIGNATURE: _____

TITLE: _____

DATE: _____

J.5 MATERIAL SAFETY DATA SHEETS – TUNGSTEN METAL POWDER-VARIOUS (JUN 06)

TUNGSTEN METAL POWDER, CARBON REDUCED (GS-00P-22924) (JUN 06)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

DEFENSE LOGISTICS AGENCY
DEFENSE NATIONAL STOCKPILE CENTER
8725 JOHN J. KINGMAN ROAD
SUITE 3339
FORT BELVOIR, VA 22060-6223

EMERGENCY TELEPHONE NUMBER:
1-800-424-9300 (NORTH AMERICA)
1-703-527-3887 (INTERNATIONAL)

SUBSTANCE: TUNGSTEN METAL POWDER, CARBON REDUCED (GS-00P-22924)

TRADE NAMES/SYNONYMS:
TUNGSTEN; WOLFRAM; TUNGSTEN ELEMENT; W; 00229900; RTECS YO7175000

CHEMICAL FAMILY: metal

CREATION DATE: May 28 2003
REVISION DATE: Jun 15 2006

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TUNGSTEN
CAS NUMBER: 7440-33-7
EC NUMBER (EINECS): 231-143-9
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=0 REACTIVITY=0



EMERGENCY OVERVIEW:

COLOR: white to gray or black

PHYSICAL FORM: powder

MAJOR HEALTH HAZARDS: No significant target effects reported.

PHYSICAL HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: lung damage

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

EYE CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

INGESTION:

SHORT TERM EXPOSURE: irritation, nausea, vomiting

LONG TERM EXPOSURE: no information on significant adverse effects

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

[4. FIRST AID MEASURES](#)

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

[5. FIRE FIGHTING MEASURES](#)

FIRE AND EXPLOSION HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

EXTINGUISHING MEDIA: dolomite, dry powder for metal fires, dry sand, graphite, soda ash, sodium chloride

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products.

[6. ACCIDENTAL RELEASE MEASURES](#)

OCCUPATIONAL RELEASE:

Collect spilled material in appropriate container for disposal.

[7. HANDLING AND STORAGE](#)

STORAGE: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

HANDLING: Use methods to minimize dust.

[8. EXPOSURE CONTROLS, PERSONAL PROTECTION](#)

EXPOSURE LIMITS:

TUNGSTEN METAL POWDER, CARBON REDUCED (GS-00P-22924):

TUNGSTEN AND INSOLUBLE COMPOUNDS (as W):

5 mg/m³ OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

10 mg/m³ OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

5 mg/m³ ACGIH TWA
10 mg/m³ ACGIH STEL
5 mg/m³ NIOSH recommended TWA 10 hour(s)
10 mg/m³ NIOSH recommended STEL
5 mg/m³ UK WEL TWA
10 mg/m³ UK WEL STEL

MEASUREMENT METHOD: NIOSH IV # 7074, 7300, 7301; OSHA # ID213

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

Measurement Element:

Tungsten (W)

50 mg/m³

Any air-purifying respirator with a high-efficiency particulate filter.

Any supplied-air respirator.

Any self-contained breathing apparatus with a full facepiece.

Escape -

Any air-purifying respirator with a full facepiece and a high-efficiency particulate filter.

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

[9. PHYSICAL AND CHEMICAL PROPERTIES](#)

PHYSICAL STATE: solid

COLOR: white to gray or black

PHYSICAL FORM: powder

ODOR: Not available

MOLECULAR WEIGHT: 183.85

MOLECULAR FORMULA: W

BOILING POINT: 10220 F (5660 C)

MELTING POINT: 6134-6206 F (3390-3430 C)

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY (water=1): 19.35

WATER SOLUBILITY: insoluble

PH: Not applicable

VOLATILITY: Not applicable

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:

Soluble: nitric acid/hydrofluoric acid mixtures, fused sodium hydroxide/sodium nitrate, fused potassium hydroxide, sodium carbonate

Very Slightly Soluble: nitric acid, aqua regia, sulfuric acid
Insoluble: hydrogen fluoride, potassium hydroxide solutions

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: None reported.

INCOMPATIBILITIES: acids, halogens, reducing agents, oxidizing materials, bases

TUNGSTEN:

ALKALI AND ALKALINE-EARTH METALS WITH HALOCARBONS: May explode with heat or on impact.

AQUA REGIA: Attacked superficially.

BROMINE PENTAFLUORIDE: Violent reaction and possible ignition.

BROMINE TRIFLUORIDE: Violent reaction.

CHLORINE TRIFLUORIDE: Violent reaction.

FLUORINE: Incandescent reaction.

HYDROGEN SULFIDE: Incandescent reaction.

IODINE PENTAFLUORIDE: Incandescent reaction when heated.

LEAD(IV) DIOXIDE: Incandescent reaction when heated.

NITRIC ACID: Attacked superficially.

NITRYL FLUORIDE: Incandescent reaction when heated.

OXIDIZERS (STRONG): Fire and explosion hazard.

OXYGEN DIFLUORIDE: Explodes at 400 C.

POTASSIUM DICHROMATE: Combustion attains a temperature of 1700 C in 0.1-0.2 seconds.

SODIUM PEROXIDE: Incandescent reaction when heated.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TUNGSTEN METAL POWDER, CARBON REDUCED (GS-00P-22924):

IRRITATION DATA:

500 mg/24 hour(s) skin-rabbit mild; 500 mg/24 hour(s) eyes-rabbit mild

TOXICITY DATA:

5 gm/kg intraperitoneal-rat LD50

ACUTE TOXICITY LEVEL: Insufficient Data.

REPRODUCTIVE EFFECTS DATA:

1210 ug/kg oral-rat TDLo 35 week(s) pre pregnancy continuous; 1160 ug/kg oral-rat TDLo 30 week(s) pre pregnancy/1-20 day(s) pregnant female continuous

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

TUNGSTEN: May cause irritation and coughing.

CHRONIC EXPOSURE:

TUNGSTEN: Prolonged or repeated exposure has been reported to cause pulmonary fibrosis. Intratracheal injection into the lungs of experimental animals revealed the metallic dust to be inert, with the only pulmonary effect being areas of

pigmentation. One conflicting study found the dust to cause interstitial pneumonitis and bronchiolitis in guinea pigs after intratracheal injection of 50 mg a week for 3 weeks. After one year, slight residual lesions in the form of minor atrophic emphysema were present.

SKIN CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the skin of rabbits caused mild irritation. May cause redness.

CHRONIC EXPOSURE:

TUNGSTEN: May cause dermatitis.

EYE CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the eyes of rabbits caused mild irritation. May cause redness and conjunctivitis.

CHRONIC EXPOSURE:

TUNGSTEN: May cause conjunctivitis.

INGESTION:

ACUTE EXPOSURE:

TUNGSTEN: May cause nausea, vomiting, and irritation of the gastrointestinal tract.

CHRONIC EXPOSURE:

TUNGSTEN: When rats were fed 2%, 5% or 10% powdered tungsten in their diets, the females gained 15.4% less weight than the control females; there was no difference between tungsten-fed and control males. The sex specific effect was suggested to depend on metabolic utilization of foodstuffs. Reproductive effects have been reported in animals.

[12. ECOLOGICAL INFORMATION](#)

Not available

[13. DISPOSAL CONSIDERATIONS](#)

Dispose in accordance with all applicable regulations.

[14. TRANSPORT INFORMATION](#)

U.S. DEPARTMENT OF TRANSPORTATION: No classification assigned.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: No classification assigned.

LAND TRANSPORT ADR: No classification assigned.

LAND TRANSPORT RID: No classification assigned.

AIR TRANSPORT IATA: No classification assigned.

AIR TRANSPORT ICAO: No classification assigned.

MARITIME TRANSPORT IMDG: No classification assigned.

15. REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: No

CHRONIC: No

FIRE: No

REACTIVE: No

SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED): Not determined.

GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):

STATE OF CLASSIFICATION: VwVwS

CLASSIFICATION UNDER HAZARD TO WATER: 0

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

16. OTHER INFORMATION

MSDS SUMMARY OF CHANGES

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

TUNGSTEN METAL POWDER, CARBON REDUCED (NSP-33, NSP-34 & 02059) (JUN 06)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**DEFENSE LOGISTICS AGENCY
DEFENSE NATIONAL STOCKPILE CENTER
8725 JOHN J. KINGMAN ROAD
SUITE 3339
FORT BELVOIR, VA 22060-6223**

**EMERGENCY TELEPHONE NUMBER:
1-800-424-9300 (NORTH AMERICA)
1-703-527-3887 (INTERNATIONAL)**

SUBSTANCE: TUNGSTEN METAL POWDER, CARBON REDUCED (NSP-33, NSP-34 & 02059)

**TRADE NAMES/SYNONYMS:
TUNGSTEN; WOLFRAM; TUNGSTEN ELEMENT; W; DLA76955; RTECS YO7175000**

CHEMICAL FAMILY: metal

CREATION DATE: Oct 01 1992
REVISION DATE: Jun 15 2006

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TUNGSTEN
CAS NUMBER: 7440-33-7
EC NUMBER (EINECS): 231-143-9
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=3 REACTIVITY=0



EMERGENCY OVERVIEW:

COLOR: white to gray or black

PHYSICAL FORM: powder

MAJOR HEALTH HAZARDS: No significant target effects reported.

PHYSICAL HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: lung damage

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

EYE CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

INGESTION:

SHORT TERM EXPOSURE: irritation, nausea, vomiting

LONG TERM EXPOSURE: no information on significant adverse effects

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

EXTINGUISHING MEDIA: dolomite, dry powder for metal fires, dry sand, graphite, soda ash, sodium chloride

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products.

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Small spills: Collect spilled material in appropriate container for disposal. Move containers away from spill to a safe area. Large spills: Wet down area with water. Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Clean up residue with a high-efficiency particulate filter vacuum.

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

HANDLING: Use methods to minimize dust.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TUNGSTEN METAL POWDER, CARBON REDUCED (NSP-33, NSP-34 & 02059):

TUNGSTEN AND INSOLUBLE COMPOUNDS (as W):

5 mg/m³ OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

10 mg/m³ OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
5 mg/m³ ACGIH TWA
10 mg/m³ ACGIH STEL
5 mg/m³ NIOSH recommended TWA 10 hour(s)
10 mg/m³ NIOSH recommended STEL
5 mg/m³ UK WEL TWA
10 mg/m³ UK WEL STEL

MEASUREMENT METHOD: NIOSH IV # 7074, 7300, 7301; OSHA # ID213

VENTILATION: Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

Measurement Element:

Tungsten (W)

50 mg/m³

Any air-purifying respirator with a high-efficiency particulate filter.

Any supplied-air respirator.

Any self-contained breathing apparatus with a full facepiece.

Escape -

Any air-purifying respirator with a full facepiece and a high-efficiency particulate filter.

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

[9. PHYSICAL AND CHEMICAL PROPERTIES](#)

PHYSICAL STATE: solid

COLOR: white to gray or black

PHYSICAL FORM: powder

ODOR: Not available

MOLECULAR WEIGHT: 183.85

MOLECULAR FORMULA: W

BOILING POINT: 10220 F (5660 C)

MELTING POINT: 6134-6206 F (3390-3430 C)

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY (water=1): 19.35

WATER SOLUBILITY: insoluble

PH: Not applicable

VOLATILITY: Not applicable

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:

Soluble: nitric acid/hydrofluoric acid mixtures, fused sodium hydroxide/sodium nitrate, fused potassium hydroxide, sodium carbonate

Very Slightly Soluble: nitric acid, aqua regia, sulfuric acid

Insoluble: hydrogen fluoride, potassium hydroxide solutions

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid generating dust. Avoid heat, flames, sparks and other sources of ignition.

INCOMPATIBILITIES: acids, halogens, reducing agents, oxidizing materials, bases

TUNGSTEN:

ALKALI AND ALKALINE-EARTH METALS WITH HALOCARBONS: May explode with heat or on impact.

AQUA REGIA: Attacked superficially.

BROMINE PENTAFLUORIDE: Violent reaction and possible ignition.

BROMINE TRIFLUORIDE: Violent reaction.

CHLORINE TRIFLUORIDE: Violent reaction.

FLUORINE: Incandescent reaction.

HYDROGEN SULFIDE: Incandescent reaction.

IODINE PENTAFLUORIDE: Incandescent reaction when heated.

LEAD(IV) DIOXIDE: Incandescent reaction when heated.

NITRIC ACID: Attacked superficially.

NITRYL FLUORIDE: Incandescent reaction when heated.

OXIDIZERS (STRONG): Fire and explosion hazard.

OXYGEN DIFLUORIDE: Explodes at 400 C.

POTASSIUM DICHROMATE: Combustion attains a temperature of 1700 C in 0.1-0.2 seconds.

SODIUM PEROXIDE: Incandescent reaction when heated.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TUNGSTEN METAL POWDER, CARBON REDUCED (NSP-33, NSP-34 & 02059):

IRRITATION DATA:

500 mg/24 hour(s) skin-rabbit mild; 500 mg/24 hour(s) eyes-rabbit mild

TOXICITY DATA:

5 gm/kg intraperitoneal-rat LD50

ACUTE TOXICITY LEVEL: Insufficient Data.

REPRODUCTIVE EFFECTS DATA:

1210 ug/kg oral-rat TDLo 35 week(s) pre pregnancy continuous; 1160 ug/kg oral-rat TDLo 30 week(s) pre pregnancy/1-20 day(s) pregnant female continuous

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

TUNGSTEN: May cause irritation and coughing.

CHRONIC EXPOSURE:

TUNGSTEN: Prolonged or repeated exposure has been reported to cause pulmonary fibrosis. Intratracheal injection into the lungs of experimental animals revealed the metallic dust to be inert, with the only pulmonary effect being areas of pigmentation. One conflicting study found the dust to cause interstitial pneumonitis and bronchiolitis in guinea pigs after intratracheal injection of 50 mg a week for 3 weeks. After one year, slight residual lesions in the form of minor atrophic emphysema were present.

SKIN CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the skin of rabbits caused mild irritation. May cause redness.

CHRONIC EXPOSURE:

TUNGSTEN: May cause dermatitis.

EYE CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the eyes of rabbits caused mild irritation. May cause redness and conjunctivitis.

CHRONIC EXPOSURE:

TUNGSTEN: May cause conjunctivitis.

INGESTION:

ACUTE EXPOSURE:

TUNGSTEN: May cause nausea, vomiting, and irritation of the gastrointestinal tract.

CHRONIC EXPOSURE:

TUNGSTEN: When rats were fed 2%, 5% or 10% powdered tungsten in their diets, the females gained 15.4% less weight than the control females; there was no difference between tungsten-fed and control males. The sex specific effect was suggested to depend on metabolic utilization of foodstuffs. Reproductive effects have been reported in animals.

[12. ECOLOGICAL INFORMATION](#)

Not available

[13. DISPOSAL CONSIDERATIONS](#)

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

[14. TRANSPORT INFORMATION](#)

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Metal powders, flammable, n.o.s.

ID NUMBER: UN3089

HAZARD CLASS OR DIVISION: 4.1

PACKING GROUP: III

LABELING REQUIREMENTS: 4.1



CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME: Metal powder, flammable, n.o.s.

UN NUMBER: UN3089

CLASS: 4.1

PACKING GROUP/RISK GROUP: III

LAND TRANSPORT ADR:

PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS: 4.1
CLASSIFICATION CODE: F3
PACKING GROUP: III
LABELS: 4.1

LAND TRANSPORT RID:

PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS: 4.1
CLASSIFICATION CODE: F3
PACKING GROUP: III
LABELS: 4.1

AIR TRANSPORT IATA:

PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN/ID NUMBER: UN3089
CLASS OR DIVISION: 4.1
HAZARD LABELS: 4.1
PACKING GROUP: III

AIR TRANSPORT ICAO:

PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS OR DIVISION: 4.1
LABELS: 4.1
UN PACKING GROUP: III

MARITIME TRANSPORT IMDG:

PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS OR DIVISION: 4.1
PACKING GROUP: III

[15. REGULATORY INFORMATION](#)

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: No
CHRONIC: No
FIRE: Yes
REACTIVE: No
SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED): Not determined.

GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):

STATE OF CLASSIFICATION: VwVwS

CLASSIFICATION UNDER HAZARD TO WATER: 0

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

[16. OTHER INFORMATION](#)

MSDS SUMMARY OF CHANGES

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPE IV) (JUN 06)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**DEFENSE LOGISTICS AGENCY
DEFENSE NATIONAL STOCKPILE CENTER
8725 JOHN J. KINGMAN ROAD
SUITE 3339
FORT BELVOIR, VA 22060-6223**

**EMERGENCY TELEPHONE NUMBER:
1-800-424-9300 (NORTH AMERICA)
1-703-527-3887 (INTERNATIONAL)**

SUBSTANCE: TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPE IV)

**TRADE NAMES/SYNONYMS:
TUNGSTEN; WOLFRAM; TUNGSTEN ELEMENT; W; 00229901; RTECS YO7175000**

CHEMICAL FAMILY: metal

CREATION DATE: May 28 2003
REVISION DATE: Jun 15 2006

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TUNGSTEN
CAS NUMBER: 7440-33-7
EC NUMBER (EINECS): 231-143-9
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=3 REACTIVITY=0



EMERGENCY OVERVIEW:

COLOR: white to gray or black

PHYSICAL FORM: powder

MAJOR HEALTH HAZARDS: No significant target effects reported.

PHYSICAL HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: lung damage

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

EYE CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

INGESTION:

SHORT TERM EXPOSURE: irritation, nausea, vomiting

LONG TERM EXPOSURE: no information on significant adverse effects

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

EXTINGUISHING MEDIA: dolomite, dry powder for metal fires, dry sand, graphite, soda ash, sodium chloride

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products.

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Small spills: Collect spilled material in appropriate container for disposal. Move containers away from spill to a safe area. Large spills: Wet down area with water. Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Clean up residue with a high-efficiency particulate filter vacuum.

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

HANDLING: Use methods to minimize dust.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPE IV):

TUNGSTEN AND INSOLUBLE COMPOUNDS (as W):

5 mg/m³ OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

10 mg/m³ OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

5 mg/m³ ACGIH TWA
10 mg/m³ ACGIH STEL
5 mg/m³ NIOSH recommended TWA 10 hour(s)
10 mg/m³ NIOSH recommended STEL
5 mg/m³ UK WEL TWA
10 mg/m³ UK WEL STEL

MEASUREMENT METHOD: NIOSH IV # 7074, 7300, 7301; OSHA # ID213

VENTILATION: Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

Measurement Element:

Tungsten (W)

50 mg/m³

Any air-purifying respirator with a high-efficiency particulate filter.

Any supplied-air respirator.

Any self-contained breathing apparatus with a full facepiece.

Escape -

Any air-purifying respirator with a full facepiece and a high-efficiency particulate filter.

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

[9. PHYSICAL AND CHEMICAL PROPERTIES](#)

PHYSICAL STATE: solid

COLOR: white to gray or black

PHYSICAL FORM: powder

ODOR: Not available

MOLECULAR WEIGHT: 183.85

MOLECULAR FORMULA: W

BOILING POINT: 10220 F (5660 C)

MELTING POINT: 6134-6206 F (3390-3430 C)

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY (water=1): 19.35

WATER SOLUBILITY: insoluble

PH: Not applicable

VOLATILITY: Not applicable

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:

Soluble: nitric acid/hydrofluoric acid mixtures, fused sodium hydroxide/sodium nitrate, fused potassium hydroxide, sodium

carbonate

Very Slightly Soluble: nitric acid, aqua regia, sulfuric acid

Insoluble: hydrogen fluoride, potassium hydroxide solutions

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid generating dust. Avoid heat, flames, sparks and other sources of ignition.

INCOMPATIBILITIES: acids, halogens, reducing agents, oxidizing materials, bases

TUNGSTEN:

ALKALI AND ALKALINE-EARTH METALS WITH HALOCARBONS: May explode with heat or on impact.

AQUA REGIA: Attacked superficially.

BROMINE PENTAFLUORIDE: Violent reaction and possible ignition.

BROMINE TRIFLUORIDE: Violent reaction.

CHLORINE TRIFLUORIDE: Violent reaction.

FLUORINE: Incandescent reaction.

HYDROGEN SULFIDE: Incandescent reaction.

IODINE PENTAFLUORIDE: Incandescent reaction when heated.

LEAD(IV) DIOXIDE: Incandescent reaction when heated.

NITRIC ACID: Attacked superficially.

NITRYL FLUORIDE: Incandescent reaction when heated.

OXIDIZERS (STRONG): Fire and explosion hazard.

OXYGEN DIFLUORIDE: Explodes at 400 C.

POTASSIUM DICHROMATE: Combustion attains a temperature of 1700 C in 0.1-0.2 seconds.

SODIUM PEROXIDE: Incandescent reaction when heated.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPE IV):

IRRITATION DATA:

500 mg/24 hour(s) skin-rabbit mild; 500 mg/24 hour(s) eyes-rabbit mild

TOXICITY DATA:

5 gm/kg intraperitoneal-rat LD50

ACUTE TOXICITY LEVEL: Insufficient Data.

REPRODUCTIVE EFFECTS DATA:

1210 ug/kg oral-rat TDLo 35 week(s) pre pregnancy continuous; 1160 ug/kg oral-rat TDLo 30 week(s) pre pregnancy/1-20 day(s) pregnant female continuous

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

TUNGSTEN: May cause irritation and coughing.

CHRONIC EXPOSURE:

TUNGSTEN: Prolonged or repeated exposure has been reported to cause pulmonary fibrosis. Intratracheal injection into the

lungs of experimental animals revealed the metallic dust to be inert, with the only pulmonary effect being areas of pigmentation. One conflicting study found the dust to cause interstitial pneumonitis and bronchiolitis in guinea pigs after intratracheal injection of 50 mg a week for 3 weeks. After one year, slight residual lesions in the form of minor atrophic emphysema were present.

SKIN CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the skin of rabbits caused mild irritation. May cause redness.

CHRONIC EXPOSURE:

TUNGSTEN: May cause dermatitis.

EYE CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the eyes of rabbits caused mild irritation. May cause redness and conjunctivitis.

CHRONIC EXPOSURE:

TUNGSTEN: May cause conjunctivitis.

INGESTION:

ACUTE EXPOSURE:

TUNGSTEN: May cause nausea, vomiting, and irritation of the gastrointestinal tract.

CHRONIC EXPOSURE:

TUNGSTEN: When rats were fed 2%, 5% or 10% powdered tungsten in their diets, the females gained 15.4% less weight than the control females; there was no difference between tungsten-fed and control males. The sex specific effect was suggested to depend on metabolic utilization of foodstuffs. Reproductive effects have been reported in animals.

12. ECOLOGICAL INFORMATION

Not available

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Metal powders, flammable, n.o.s.

ID NUMBER: UN3089

HAZARD CLASS OR DIVISION: 4.1

PACKING GROUP: II

LABELING REQUIREMENTS: 4.1



CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME: Metal powder, flammable, n.o.s.

UN NUMBER: UN3089

CLASS: 4.1

PACKING GROUP/RISK GROUP: II

LAND TRANSPORT ADR:

PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS: 4.1
CLASSIFICATION CODE: F3
PACKING GROUP: II
LABELS: 4.1

LAND TRANSPORT RID:
PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS: 4.1
CLASSIFICATION CODE: F3
PACKING GROUP: II
LABELS: 4.1

AIR TRANSPORT IATA:
PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN/ID NUMBER: UN3089
CLASS OR DIVISION: 4.1
HAZARD LABELS: 4.1
PACKING GROUP: II

AIR TRANSPORT ICAO:
PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS OR DIVISION: 4.1
LABELS: 4.1
UN PACKING GROUP: II

MARITIME TRANSPORT IMDG:
PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS OR DIVISION: 4.1
PACKING GROUP: II

15. REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: No

CHRONIC: No

FIRE: Yes

REACTIVE: No

SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED): Not determined.

GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):

STATE OF CLASSIFICATION: VwVwS

CLASSIFICATION UNDER HAZARD TO WATER: 0

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

16. OTHER INFORMATION

MSDS SUMMARY OF CHANGES

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPES V, VI, VII) (JUN 06)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**DEFENSE LOGISTICS AGENCY
DEFENSE NATIONAL STOCKPILE CENTER
8725 JOHN J. KINGMAN ROAD
SUITE 3339
FORT BELVOIR, VA 22060-6223**

**EMERGENCY TELEPHONE NUMBER:
1-800-424-9300 (NORTH AMERICA)
1-703-527-3887 (INTERNATIONAL)**

SUBSTANCE: TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPES V, VI, VII)

**TRADE NAMES/SYNONYMS:
TUNGSTEN; WOLFRAM; TUNGSTEN ELEMENT; W; 00229902; RTECS YO7175000**

CHEMICAL FAMILY: metal

CREATION DATE: May 28 2003
REVISION DATE: Jun 15 2006

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TUNGSTEN
CAS NUMBER: 7440-33-7
EC NUMBER (EINECS): 231-143-9
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=3 REACTIVITY=0



EMERGENCY OVERVIEW:
COLOR: white to gray or black
PHYSICAL FORM: powder
MAJOR HEALTH HAZARDS: No significant target effects reported.
PHYSICAL HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: lung damage
SKIN CONTACT:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: irritation
EYE CONTACT:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: irritation
INGESTION:
SHORT TERM EXPOSURE: irritation, nausea, vomiting
LONG TERM EXPOSURE: no information on significant adverse effects

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

EXTINGUISHING MEDIA: dolomite, dry powder for metal fires, dry sand, graphite, soda ash, sodium chloride

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products.

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Small spills: Collect spilled material in appropriate container for disposal. Move containers away from spill to a safe area. Large spills: Wet down area with water. Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Clean up residue with a high-efficiency particulate filter vacuum.

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

HANDLING: Use methods to minimize dust.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPES V, VI, VII):

TUNGSTEN AND INSOLUBLE COMPOUNDS (as W):

5 mg/m³ OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

10 mg/m³ OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

5 mg/m³ ACGIH TWA
10 mg/m³ ACGIH STEL
5 mg/m³ NIOSH recommended TWA 10 hour(s)
10 mg/m³ NIOSH recommended STEL
5 mg/m³ UK WEL TWA
10 mg/m³ UK WEL STEL

MEASUREMENT METHOD: NIOSH IV # 7074, 7300, 7301; OSHA # ID213

VENTILATION: Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

Measurement Element:

Tungsten (W)

50 mg/m³

Any air-purifying respirator with a high-efficiency particulate filter.

Any supplied-air respirator.

Any self-contained breathing apparatus with a full facepiece.

Escape -

Any air-purifying respirator with a full facepiece and a high-efficiency particulate filter.

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

[9. PHYSICAL AND CHEMICAL PROPERTIES](#)

PHYSICAL STATE: solid

COLOR: white to gray or black

PHYSICAL FORM: powder

ODOR: Not available

MOLECULAR WEIGHT: 183.85

MOLECULAR FORMULA: W

BOILING POINT: 10220 F (5660 C)

MELTING POINT: 6134-6206 F (3390-3430 C)

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY (water=1): 19.35

WATER SOLUBILITY: insoluble

PH: Not applicable

VOLATILITY: Not applicable

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:

Soluble: nitric acid/hydrofluoric acid mixtures, fused sodium hydroxide/sodium nitrate, fused potassium hydroxide, sodium

carbonate

Very Slightly Soluble: nitric acid, aqua regia, sulfuric acid

Insoluble: hydrogen fluoride, potassium hydroxide solutions

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid generating dust. Avoid heat, flames, sparks and other sources of ignition.

INCOMPATIBILITIES: acids, halogens, reducing agents, oxidizing materials, bases

TUNGSTEN:

ALKALI AND ALKALINE-EARTH METALS WITH HALOCARBONS: May explode with heat or on impact.

AQUA REGIA: Attacked superficially.

BROMINE PENTAFLUORIDE: Violent reaction and possible ignition.

BROMINE TRIFLUORIDE: Violent reaction.

CHLORINE TRIFLUORIDE: Violent reaction.

FLUORINE: Incandescent reaction.

HYDROGEN SULFIDE: Incandescent reaction.

IODINE PENTAFLUORIDE: Incandescent reaction when heated.

LEAD(IV) DIOXIDE: Incandescent reaction when heated.

NITRIC ACID: Attacked superficially.

NITRYL FLUORIDE: Incandescent reaction when heated.

OXIDIZERS (STRONG): Fire and explosion hazard.

OXYGEN DIFLUORIDE: Explodes at 400 C.

POTASSIUM DICHROMATE: Combustion attains a temperature of 1700 C in 0.1-0.2 seconds.

SODIUM PEROXIDE: Incandescent reaction when heated.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPES V, VI, VII):

IRRITATION DATA:

500 mg/24 hour(s) skin-rabbit mild; 500 mg/24 hour(s) eyes-rabbit mild

TOXICITY DATA:

5 gm/kg intraperitoneal-rat LD50

ACUTE TOXICITY LEVEL: Insufficient Data.

REPRODUCTIVE EFFECTS DATA:

1210 ug/kg oral-rat TDLo 35 week(s) pre pregnancy continuous; 1160 ug/kg oral-rat TDLo 30 week(s) pre pregnancy/1-20 day(s) pregnant female continuous

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

TUNGSTEN: May cause irritation and coughing.

CHRONIC EXPOSURE:

TUNGSTEN: Prolonged or repeated exposure has been reported to cause pulmonary fibrosis. Intratracheal injection into the

lungs of experimental animals revealed the metallic dust to be inert, with the only pulmonary effect being areas of pigmentation. One conflicting study found the dust to cause interstitial pneumonitis and bronchiolitis in guinea pigs after intratracheal injection of 50 mg a week for 3 weeks. After one year, slight residual lesions in the form of minor atrophic emphysema were present.

SKIN CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the skin of rabbits caused mild irritation. May cause redness.

CHRONIC EXPOSURE:

TUNGSTEN: May cause dermatitis.

EYE CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the eyes of rabbits caused mild irritation. May cause redness and conjunctivitis.

CHRONIC EXPOSURE:

TUNGSTEN: May cause conjunctivitis.

INGESTION:

ACUTE EXPOSURE:

TUNGSTEN: May cause nausea, vomiting, and irritation of the gastrointestinal tract.

CHRONIC EXPOSURE:

TUNGSTEN: When rats were fed 2%, 5% or 10% powdered tungsten in their diets, the females gained 15.4% less weight than the control females; there was no difference between tungsten-fed and control males. The sex specific effect was suggested to depend on metabolic utilization of foodstuffs. Reproductive effects have been reported in animals.

12. ECOLOGICAL INFORMATION

Not available

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Metal powders, flammable, n.o.s.

ID NUMBER: UN3089

HAZARD CLASS OR DIVISION: 4.1

PACKING GROUP: III

LABELING REQUIREMENTS: 4.1

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME: Metal powder, flammable, n.o.s.

UN NUMBER: UN3089

CLASS: 4.1

PACKING GROUP/RISK GROUP: III

LAND TRANSPORT ADR:



PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS: 4.1
CLASSIFICATION CODE: F3
PACKING GROUP: III
LABELS: 4.1

LAND TRANSPORT RID:
PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS: 4.1
CLASSIFICATION CODE: F3
PACKING GROUP: III
LABELS: 4.1

AIR TRANSPORT IATA:
PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN/ID NUMBER: UN3089
CLASS OR DIVISION: 4.1
HAZARD LABELS: 4.1
PACKING GROUP: III

AIR TRANSPORT ICAO:
PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS OR DIVISION: 4.1
LABELS: 4.1
UN PACKING GROUP: III

MARITIME TRANSPORT IMDG:
PROPER SHIPPING NAME: Metal powder, flammable, n.o.s.
UN NUMBER: UN3089
CLASS OR DIVISION: 4.1
PACKING GROUP: III

15. REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: No

CHRONIC: No

FIRE: Yes

REACTIVE: No

SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED): Not determined.

GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):

STATE OF CLASSIFICATION: VwVwS

CLASSIFICATION UNDER HAZARD TO WATER: 0

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

16. OTHER INFORMATION

MSDS SUMMARY OF CHANGES

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPES VIII, IX, X) (JUN 06)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**DEFENSE LOGISTICS AGENCY
DEFENSE NATIONAL STOCKPILE CENTER
8725 JOHN J. KINGMAN ROAD
SUITE 3339
FORT BELVOIR, VA 22060-6223**

**EMERGENCY TELEPHONE NUMBER:
1-800-424-9300 (NORTH AMERICA)
1-703-527-3887 (INTERNATIONAL)**

SUBSTANCE: TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPES VIII, IX, X)

**TRADE NAMES/SYNONYMS:
TUNGSTEN; WOLFRAM; TUNGSTEN ELEMENT; W; 00229903; RTECS YO7175000**

CHEMICAL FAMILY: metal

CREATION DATE: May 28 2003
REVISION DATE: Jun 15 2006

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TUNGSTEN
CAS NUMBER: 7440-33-7
EC NUMBER (EINECS): 231-143-9
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=0 REACTIVITY=0



EMERGENCY OVERVIEW:
COLOR: white to gray or black
PHYSICAL FORM: powder
MAJOR HEALTH HAZARDS: No significant target effects reported.
PHYSICAL HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: lung damage
SKIN CONTACT:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: irritation
EYE CONTACT:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: irritation
INGESTION:
SHORT TERM EXPOSURE: irritation, nausea, vomiting
LONG TERM EXPOSURE: no information on significant adverse effects

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

EXTINGUISHING MEDIA: dolomite, dry powder for metal fires, dry sand, graphite, soda ash, sodium chloride

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products.

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Collect spilled material in appropriate container for disposal.

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

HANDLING: Use methods to minimize dust.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPES VIII, IX, X):

TUNGSTEN AND INSOLUBLE COMPOUNDS (as W):

5 mg/m³ OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

10 mg/m³ OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

5 mg/m³ ACGIH TWA

10 mg/m³ ACGIH STEL

5 mg/m³ NIOSH recommended TWA 10 hour(s)

10 mg/m³ NIOSH recommended STEL
5 mg/m³ UK WEL TWA
10 mg/m³ UK WEL STEL

MEASUREMENT METHOD: NIOSH IV # 7074, 7300, 7301; OSHA # ID213

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

Measurement Element:

Tungsten (W)

50 mg/m³

Any air-purifying respirator with a high-efficiency particulate filter.

Any supplied-air respirator.

Any self-contained breathing apparatus with a full facepiece.

Escape -

Any air-purifying respirator with a full facepiece and a high-efficiency particulate filter.

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: solid

COLOR: white to gray or black

PHYSICAL FORM: powder

ODOR: Not available

MOLECULAR WEIGHT: 183.85

MOLECULAR FORMULA: W

BOILING POINT: 10220 F (5660 C)

MELTING POINT: 6134-6206 F (3390-3430 C)

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY (water=1): 19.35

WATER SOLUBILITY: insoluble

PH: Not applicable

VOLATILITY: Not applicable

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:

Soluble: nitric acid/hydrofluoric acid mixtures, fused sodium hydroxide/sodium nitrate, fused potassium hydroxide, sodium carbonate

Very Slightly Soluble: nitric acid, aqua regia, sulfuric acid

Insoluble: hydrogen fluoride, potassium hydroxide solutions

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: None reported.

INCOMPATIBILITIES: acids, halogens, reducing agents, oxidizing materials, bases

TUNGSTEN:

ALKALI AND ALKALINE-EARTH METALS WITH HALOCARBONS: May explode with heat or on impact.

AQUA REGIA: Attacked superficially.

BROMINE PENTAFLUORIDE: Violent reaction and possible ignition.

BROMINE TRIFLUORIDE: Violent reaction.

CHLORINE TRIFLUORIDE: Violent reaction.

FLUORINE: Incandescent reaction.

HYDROGEN SULFIDE: Incandescent reaction.

IODINE PENTAFLUORIDE: Incandescent reaction when heated.

LEAD(IV) DIOXIDE: Incandescent reaction when heated.

NITRIC ACID: Attacked superficially.

NITRYL FLUORIDE: Incandescent reaction when heated.

OXIDIZERS (STRONG): Fire and explosion hazard.

OXYGEN DIFLUORIDE: Explodes at 400 C.

POTASSIUM DICHROMATE: Combustion attains a temperature of 1700 C in 0.1-0.2 seconds.

SODIUM PEROXIDE: Incandescent reaction when heated.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TUNGSTEN METAL POWDER, HYDROGEN REDUCED (TYPES VIII, IX, X):

IRRITATION DATA:

500 mg/24 hour(s) skin-rabbit mild; 500 mg/24 hour(s) eyes-rabbit mild

TOXICITY DATA:

5 gm/kg intraperitoneal-rat LD50

ACUTE TOXICITY LEVEL: Insufficient Data.

REPRODUCTIVE EFFECTS DATA:

1210 ug/kg oral-rat TDLo 35 week(s) pre pregnancy continuous; 1160 ug/kg oral-rat TDLo 30 week(s) pre pregnancy/1-20 day(s) pregnant female continuous

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

TUNGSTEN: May cause irritation and coughing.

CHRONIC EXPOSURE:

TUNGSTEN: Prolonged or repeated exposure has been reported to cause pulmonary fibrosis. Intratracheal injection into the lungs of experimental animals revealed the metallic dust to be inert, with the only pulmonary effect being areas of pigmentation. One conflicting study found the dust to cause interstitial pneumonitis and bronchiolitis in guinea pigs after intratracheal injection of 50 mg a week for 3 weeks. After one year, slight residual lesions in the form of minor atrophic emphysema were present.

SKIN CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the skin of rabbits caused mild irritation. May cause redness.

CHRONIC EXPOSURE:

TUNGSTEN: May cause dermatitis.

EYE CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the eyes of rabbits caused mild irritation. May cause redness and conjunctivitis.

CHRONIC EXPOSURE:

TUNGSTEN: May cause conjunctivitis.

INGESTION:

ACUTE EXPOSURE:

TUNGSTEN: May cause nausea, vomiting, and irritation of the gastrointestinal tract.

CHRONIC EXPOSURE:

TUNGSTEN: When rats were fed 2%, 5% or 10% powdered tungsten in their diets, the females gained 15.4% less weight than the control females; there was no difference between tungsten-fed and control males. The sex specific effect was suggested to depend on metabolic utilization of foodstuffs. Reproductive effects have been reported in animals.

[12. ECOLOGICAL INFORMATION](#)

Not available

[13. DISPOSAL CONSIDERATIONS](#)

Dispose in accordance with all applicable regulations.

[14. TRANSPORT INFORMATION](#)

U.S. DEPARTMENT OF TRANSPORTATION: No classification assigned.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: No classification assigned.

LAND TRANSPORT ADR: No classification assigned.

LAND TRANSPORT RID: No classification assigned.

AIR TRANSPORT IATA: No classification assigned.

AIR TRANSPORT ICAO: No classification assigned.

MARITIME TRANSPORT IMDG: No classification assigned.

[15. REGULATORY INFORMATION](#)

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: No

CHRONIC: No

FIRE: No

REACTIVE: No

SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED): Not determined.

GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):

STATE OF CLASSIFICATION: VwVwS

CLASSIFICATION UNDER HAZARD TO WATER: 0

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

[16. OTHER INFORMATION](#)

MSDS SUMMARY OF CHANGES

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

TUNGSTEN METAL SCRAP (JUN 06)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**DEFENSE LOGISTICS AGENCY
DEFENSE NATIONAL STOCKPILE CENTER
8725 JOHN J. KINGMAN ROAD
SUITE 3339
FORT BELVOIR, VA 22060-6223**

**EMERGENCY TELEPHONE NUMBER:
1-800-424-9300 (NORTH AMERICA)
1-703-527-3887 (INTERNATIONAL)**

SUBSTANCE: TUNGSTEN METAL SCRAP

**TRADE NAMES/SYNONYMS:
TUNGSTEN; WOLFRAM; TUNGSTEN ELEMENT; W; 00229897; RTECS YO7175000**

CHEMICAL FAMILY: metal

CREATION DATE: May 28 2003
REVISION DATE: Jun 15 2006

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TUNGSTEN
CAS NUMBER: 7440-33-7
EC NUMBER (EINECS): 231-143-9
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=0 REACTIVITY=0



EMERGENCY OVERVIEW:

COLOR: white to gray or black

PHYSICAL FORM: solid

MAJOR HEALTH HAZARDS: No significant target effects reported.

PHYSICAL HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: lung damage

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

EYE CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

INGESTION:

SHORT TERM EXPOSURE: irritation, nausea, vomiting

LONG TERM EXPOSURE: no information on significant adverse effects

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire and explosion hazard in bulk form. Dust/air mixtures may ignite or explode.

EXTINGUISHING MEDIA: dolomite, dry powder for metal fires, dry sand, graphite, soda ash, sodium chloride

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products.

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Collect spilled material in appropriate container for disposal.

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

HANDLING: Use methods to minimize dust.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TUNGSTEN METAL SCRAP:

TUNGSTEN AND INSOLUBLE COMPOUNDS (as W):

5 mg/m³ OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

10 mg/m³ OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

5 mg/m³ ACGIH TWA

10 mg/m³ ACGIH STEL

5 mg/m³ NIOSH recommended TWA 10 hour(s)

10 mg/m³ NIOSH recommended STEL
5 mg/m³ UK WEL TWA
10 mg/m³ UK WEL STEL

MEASUREMENT METHOD: NIOSH IV # 7074, 7300, 7301; OSHA # ID213

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

Measurement Element:

Tungsten (W)

50 mg/m³

Any air-purifying respirator with a high-efficiency particulate filter.

Any supplied-air respirator.

Any self-contained breathing apparatus with a full facepiece.

Escape -

Any air-purifying respirator with a full facepiece and a high-efficiency particulate filter.

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: solid

COLOR: white to gray or black

ODOR: Not available

MOLECULAR WEIGHT: 183.85

MOLECULAR FORMULA: W

BOILING POINT: 10220 F (5660 C)

MELTING POINT: 6134-6206 F (3390-3430 C)

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY (water=1): 19.35

WATER SOLUBILITY: insoluble

PH: Not applicable

VOLATILITY: Not applicable

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:

Soluble: nitric acid/hydrofluoric acid mixtures, fused sodium hydroxide/sodium nitrate, fused potassium hydroxide, sodium carbonate

Very Slightly Soluble: nitric acid, aqua regia, sulfuric acid

Insoluble: hydrogen fluoride, potassium hydroxide solutions

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: None reported.

INCOMPATIBILITIES: acids, halogens, reducing agents, oxidizing materials, bases

TUNGSTEN:

ALKALI AND ALKALINE-EARTH METALS WITH HALOCARBONS: May explode with heat or on impact.

AQUA REGIA: Attacked superficially.

BROMINE PENTAFLUORIDE: Violent reaction and possible ignition.

BROMINE TRIFLUORIDE: Violent reaction.

CHLORINE TRIFLUORIDE: Violent reaction.

FLUORINE: Incandescent reaction.

HYDROGEN SULFIDE: Incandescent reaction.

IODINE PENTAFLUORIDE: Incandescent reaction when heated.

LEAD(IV) DIOXIDE: Incandescent reaction when heated.

NITRIC ACID: Attacked superficially.

NITRYL FLUORIDE: Incandescent reaction when heated.

OXIDIZERS (STRONG): Fire and explosion hazard.

OXYGEN DIFLUORIDE: Explodes at 400 C.

POTASSIUM DICHROMATE: Combustion attains a temperature of 1700 C in 0.1-0.2 seconds.

SODIUM PEROXIDE: Incandescent reaction when heated.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TUNGSTEN METAL SCRAP:

IRRITATION DATA:

500 mg/24 hour(s) skin-rabbit mild; 500 mg/24 hour(s) eyes-rabbit mild

TOXICITY DATA:

5 gm/kg intraperitoneal-rat LD50

ACUTE TOXICITY LEVEL: Insufficient Data.

REPRODUCTIVE EFFECTS DATA:

1210 ug/kg oral-rat TDLo 35 week(s) pre pregnancy continuous; 1160 ug/kg oral-rat TDLo 30 week(s) pre pregnancy/1-20 day(s) pregnant female continuous

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

TUNGSTEN: May cause irritation and coughing.

CHRONIC EXPOSURE:

TUNGSTEN: Prolonged or repeated exposure has been reported to cause pulmonary fibrosis. Intratracheal injection into the lungs of experimental animals revealed the metallic dust to be inert, with the only pulmonary effect being areas of pigmentation. One conflicting study found the dust to cause interstitial pneumonitis and bronchiolitis in guinea pigs after intratracheal injection of 50 mg a week for 3 weeks. After one year, slight residual lesions in the form of minor atrophic emphysema were present.

SKIN CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the skin of rabbits caused mild irritation. May cause redness.

CHRONIC EXPOSURE:

TUNGSTEN: May cause dermatitis.

EYE CONTACT:

ACUTE EXPOSURE:

TUNGSTEN: Application of 500 mg to the eyes of rabbits caused mild irritation. May cause redness and conjunctivitis.

CHRONIC EXPOSURE:

TUNGSTEN: May cause conjunctivitis.

INGESTION:

ACUTE EXPOSURE:

TUNGSTEN: May cause nausea, vomiting, and irritation of the gastrointestinal tract.

CHRONIC EXPOSURE:

TUNGSTEN: When rats were fed 2%, 5% or 10% powdered tungsten in their diets, the females gained 15.4% less weight than the control females; there was no difference between tungsten-fed and control males. The sex specific effect was suggested to depend on metabolic utilization of foodstuffs. Reproductive effects have been reported in animals.

[12. ECOLOGICAL INFORMATION](#)

Not available

[13. DISPOSAL CONSIDERATIONS](#)

Dispose in accordance with all applicable regulations.

[14. TRANSPORT INFORMATION](#)

U.S. DEPARTMENT OF TRANSPORTATION: No classification assigned.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: No classification assigned.

LAND TRANSPORT ADR: No classification assigned.

LAND TRANSPORT RID: No classification assigned.

AIR TRANSPORT IATA: No classification assigned.

AIR TRANSPORT ICAO: No classification assigned.

MARITIME TRANSPORT IMDG: No classification assigned.

[15. REGULATORY INFORMATION](#)

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: No

CHRONIC: No

FIRE: No

REACTIVE: No

SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED): Not determined.

GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):

STATE OF CLASSIFICATION: VwVwS

CLASSIFICATION UNDER HAZARD TO WATER: 0

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

[16. OTHER INFORMATION](#)

MSDS SUMMARY OF CHANGES

8. EXPOSURE CONTROLS, PERSONAL PROTECTION