



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

IN REPLY
 REFER TO DNSC-CC

June 13, 2006

AMENDMENT NO. 008
TO BASIC ORDERING AGREEMENT FOR
TANTALUM MATERIALS
UNDER DLA-TANTALUM-001

The above referenced Basic Ordering Agreement for the sale of tantalum materials is hereby amended as follows:

1. Amendment No. 007 is hereby deleted in its entirety.
2. **Section A** is hereby amended to incorporate the following:

Section A.9 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 J-LIST OF ATTACHMENTS**, subsection **J.4 Material Safety Data Sheets** in Amendment No. 006 is hereby deleted in its entirety and replaced with the attached **J.4 Material Safety Data Sheets (MAR 06)**.

4. Quoters shall acknowledge receipt of this Amendment by signing in the space provided below and returning this form to:

Attn: Tantalum/Columbium Contract Specialist, DNSC-C
 Defense National Stockpile Center (DNSC)
 8725 John J. Kingman Road, STE 3229
 Fort Belvoir, VA 22060-6223
 Facsimile No. (703) 767-5411

Failure to acknowledge receipt of the Amendment may result in the Quoter being ineligible to Quote. Except as provided herein, all other terms and conditions of DLA-TANTALUM-001 with Amendments No. 001 and 006 remain unchanged and in full force and effect except as herein amended.

NAME OF FIRM: _____

ADDRESS: _____

TELEPHONE: _____ FACSIMILE: _____

COMPLETED BY: _____

SIGNATURE: _____ DATE: _____

TITLE: _____

WEB PAGE: _____ E-MAIL ADDRESS: _____

Access to Basic Ordering Agreement DLA-TANTALUM-001, Amendments No. 001, 006 and this amendment is available at the DNSC Website: <https://www.dnsc.dla.mil>

Section J.4 Material Safety Data Sheets (MAR 06)

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J.4 MATERIAL SAFETY DATA SHEET (MAR 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: TANTALUM

TRADE NAMES/SYNONYMS:

TANTALUM-181; TANTALUM POWDER; TA; DLA22420; RTECS WW5505000

CHEMICAL FAMILY: metal

CREATION DATE: Jul 01 1992

REVISION DATE: Mar 16 2006

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TANTALUM
CAS NUMBER: 7440-25-7
EC NUMBER (EINECS): 231-135-5
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

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

EMERGENCY OVERVIEW:

PHYSICAL DESCRIPTION: Odorless, gray to bluish, hard, malleable, ductile metal or black powder. When polished the metal may be silver white.

MAJOR HEALTH HAZARDS: No significant target effects reported.

PHYSICAL HAZARDS: Extremely flammable. May ignite spontaneously on exposure to air. Dust/air mixtures may ignite or explode.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: no information on significant adverse effects

LONG TERM EXPOSURE: lung damage

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation

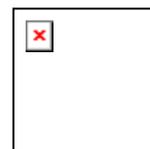
LONG TERM EXPOSURE: no information is available

EYE CONTACT:

SHORT TERM EXPOSURE: mild irritation

LONG TERM EXPOSURE: no information on significant adverse effects

INGESTION:



SHORT TERM EXPOSURE: no information on significant adverse effects

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 exposed skin with soap and water.

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. Finely divided material may ignite spontaneously. May ignite on exposure to air.

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

Do not get water directly on material.

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.

LOWER FLAMMABLE LIMIT:

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. Keep material wetted. Store in compatible containers. Store in a cool, dry place.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TANTALUM:

TANTALUM METAL AND OXIDE DUSTS (as Ta):

5 mg/m³ OSHA TWA

5 mg/m³ ACGIH TWA

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

10 mg/m³ NIOSH recommended STEL

4 mg/m³ DFG MAK (inhalable fraction)

1.5 mg/m³ DFG MAK (respirable fraction)

5 mg/m³ UK WEL TWA (metal)

10 mg/m³ UK WEL STEL (metal)

MEASUREMENT METHOD: Particulate filter; Gravimetric; NIOSH IV # 0500, Nuisance Dust (total)

VENTILATION: Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. 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: Protective clothing is not required.

GLOVES: Protective gloves are not required, but recommended.

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

Measurement Element:

Tantalum (Ta)

25 mg/m³

Any dust and mist respirator.

50 mg/m³

Any dust and mist respirator except single-use and quarter-mask respirators.

Any dust, mist, and fume respirator.

Any supplied-air respirator.

125 mg/m³

Any supplied-air respirator operated in a continuous-flow mode.

Any powered, air-purifying respirator with a dust and mist filter.

250 mg/m³

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

Any supplied-air respirator with a tight-fitting facepiece that is operated in a continuous-flow mode.

Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

2500 mg/m³

Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.

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 DESCRIPTION: Odorless, gray to bluish, hard, malleable, ductile metal or black powder. When polished the metal may be silver white.

MOLECULAR WEIGHT: 180.9

MOLECULAR FORMULA: TA

BOILING POINT: 9797 F (5425 C) approximate

MELTING POINT: 5425 F (2996 C)

VAPOR PRESSURE: 0.0 mmHg @ 20 C

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY (water=1): 16.69

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: hydrofluoric acid, fused alkali, fuming sulfuric acid, nitric acid/hydrofluoric acid mixtures

Insoluble: acids, alkali

10. STABILITY AND REACTIVITY

REACTIVITY: Finely divided material may ignite spontaneously.

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

INCOMPATIBILITIES: halogens, oxidizing materials, acids

TANTALUM:

BROMINE TRIFLUORIDE: Incandescent reaction.

FLUORINE: Ignites on contact.

LEAD CHROMATE: May react explosively.

MINERAL ACIDS: Incompatible.

OXIDIZERS (STRONG): Fire and explosion hazard.

SULFUR TRIOXIDE: Incompatible.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TANTALUM:

TOXICITY DATA:

595 mg/kg oral-mouse LD50

ACUTE TOXICITY LEVEL:

Moderately Toxic: ingestion

TUMORIGENIC DATA:

3760 mg/kg implant-rat TDLo

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

TANTALUM: Insufflation of the metal powder in humans was without adverse effects.

CHRONIC EXPOSURE:

TANTALUM: Repeated or prolonged exposure to tantalum alloys may have caused a mild fibrosis and chronic rhinitis in exposed workers and may play a role in producing "hard metal pneumoconiosis" in workers exposed to tantalum as well as other metals.

SKIN CONTACT:

ACUTE EXPOSURE:

TANTALUM: May cause irritation.

CHRONIC EXPOSURE:

TANTALUM: No data available.

EYE CONTACT:

ACUTE EXPOSURE:

TANTALUM: Dusts may cause slight irritation.

CHRONIC EXPOSURE:

TANTALUM: Implantation of the metal into rabbit eyes for longer than a year has been reported to cause no significant adverse effects.

INGESTION:

ACUTE EXPOSURE:

TANTALUM: Large oral doses of tantalum compounds were well tolerated by rats indicating poor absorption.

CHRONIC EXPOSURE:

TANTALUM: Animal studies indicate absorption may occur.

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: Yes

CHRONIC: No

FIRE: Yes

REACTIVE: Yes

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:

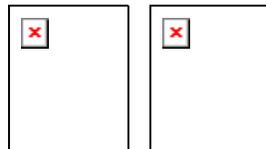
WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED):

F	Highly Flammable
Xn	Harmful

DANGER/HAZARD SYMBOL:



EC RISK AND SAFETY PHRASES:

R 17	Spontaneously flammable in air.
R 22	Harmful if swallowed.

S 2	Keep out of the reach of children.
S 13	Keep away from food, drink and animal feedingstuffs.
S 24	Avoid contact with skin.
S 36	Wear suitable protective clothing.
S 46	If swallowed, seek medical advice immediately and show this container or label.

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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J.4 MATERIAL SAFETY DATA SHEET (MAR 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: TANTALUM METAL POWDER, CAPACITOR GRADE 2

TRADE NAMES/SYNONYMS:

TANTALUM-181; TANTALUM POWDER; TANTALUM; Ta; 00229895; RTECS WW5505000

CHEMICAL FAMILY: metal

CREATION DATE: May 27 2003

REVISION DATE: Mar 16 2006

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TANTALUM
CAS NUMBER: 7440-25-7
EC NUMBER (EINECS): 231-135-5
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=3 REACTIVITY=2

EMERGENCY OVERVIEW:

COLOR: blue to gray

PHYSICAL FORM: solid or powder

ODOR: odorless

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. Extremely flammable. May ignite spontaneously on exposure to air.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: no information on significant adverse effects

LONG TERM EXPOSURE: lung damage

SKIN CONTACT:

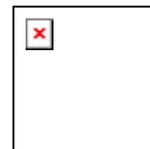
SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: no information is available

EYE CONTACT:

SHORT TERM EXPOSURE: mild irritation

LONG TERM EXPOSURE: no information on significant adverse effects



INGESTION:

SHORT TERM EXPOSURE: no information on significant adverse effects

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. Finely divided material may ignite spontaneously. May ignite on exposure to air.

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.

LOWER FLAMMABLE LIMIT:

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 material wetted. Store in compatible containers. Store under an oxygen-free liquid (e.g., certain petroleum oils). Keep separated from incompatible substances.

HANDLING: Use methods to minimize dust.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TANTALUM METAL POWDER, CAPACITOR GRADE 2:

TANTALUM METAL AND OXIDE DUSTS (as Ta):

5 mg/m³ OSHA TWA

5 mg/m³ ACGIH TWA

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

10 mg/m³ NIOSH recommended STEL

4 mg/m³ DFG MAK (inhalable fraction)

1.5 mg/m³ DFG MAK (respirable fraction)

5 mg/m³ UK WEL TWA (metal)

10 mg/m³ UK WEL STEL (metal)

MEASUREMENT METHOD: Particulate filter; Gravimetric; NIOSH IV # 0500, Nuisance Dust (total)

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:

Tantalum (Ta)

25 mg/m³

Any dust and mist respirator.

50 mg/m³

Any dust and mist respirator except single-use and quarter-mask respirators.

Any dust, mist, and fume respirator.

Any supplied-air respirator.

125 mg/m³

Any supplied-air respirator operated in a continuous-flow mode.

Any powered, air-purifying respirator with a dust and mist filter.

250 mg/m³

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

Any supplied-air respirator with a tight-fitting facepiece that is operated in a continuous-flow mode.

Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

2500 mg/m³

Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.

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: blue to gray

PHYSICAL FORM: solid or powder

ODOR: odorless

MOLECULAR WEIGHT: 180.9

MOLECULAR FORMULA: Ta

BOILING POINT: 9797 F (5425 C) approximate

MELTING POINT: 5425 F (2996 C)

VAPOR PRESSURE: 0.0 mmHg @ 20 C

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY: Not available

DENSITY: 16.69 g/cc

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: hydrofluoric acid, fused alkali, fuming sulfuric acid, nitric acid/hydrofluoric acid mixtures

Insoluble: acids, alkali

10. STABILITY AND REACTIVITY

REACTIVITY: Finely divided material may ignite spontaneously.

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

INCOMPATIBILITIES: halogens, oxidizing materials, acids

TANTALUM:

BROMINE TRIFLUORIDE: Incandescent reaction.

FLUORINE: Ignites on contact.

LEAD CHROMATE: May react explosively.

MINERAL ACIDS: Incompatible.

OXIDIZERS (STRONG): Fire and explosion hazard.

SULFUR TRIOXIDE: Incompatible.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: oxides of tantalum

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TANTALUM METAL POWDER, CAPACITOR GRADE 2:

TOXICITY DATA:

595 mg/kg oral-mouse LD50

ACUTE TOXICITY LEVEL:

Moderately Toxic: ingestion

TUMORIGENIC DATA:

3760 mg/kg implant-rat TDLo

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

TANTALUM: Insufflation of the metal powder in humans was without adverse effects.

CHRONIC EXPOSURE:

TANTALUM: Repeated or prolonged exposure to tantalum alloys may have caused a mild fibrosis and chronic rhinitis in exposed workers and may play a role in producing "hard metal pneumoconiosis" in workers exposed to tantalum as well as other metals.

SKIN CONTACT:

ACUTE EXPOSURE:

TANTALUM: May cause irritation.

CHRONIC EXPOSURE:

TANTALUM: No data available.

EYE CONTACT:

ACUTE EXPOSURE:

TANTALUM: Dusts may cause slight irritation.

CHRONIC EXPOSURE:

TANTALUM: Implantation of the metal into rabbit eyes for longer than a year has been reported to cause no significant adverse effects.

INGESTION:

ACUTE EXPOSURE:

TANTALUM: Large oral doses of tantalum compounds were well tolerated by rats indicating poor absorption.

CHRONIC EXPOSURE:

TANTALUM: Animal studies indicate absorption may occur.

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. D003.

14. TRANSPORT INFORMATION

**DLA-TANTALUM-001
AMENDMENT NO. 008**

U.S. DOT 49 CFR 172.101:

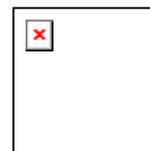
PROPER SHIPPING NAME: Metal powders, flammable, n.o.s.

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.

**DLA-TANTALUM-001
AMENDMENT NO. 008**

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: Yes

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:

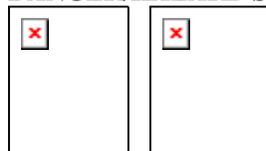
WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED):

F	Highly Flammable
Xn	Harmful

DANGER/HAZARD SYMBOL:



EC RISK AND SAFETY PHRASES:

R 17	Spontaneously flammable in air.
R 22	Harmful if swallowed.
S 2	Keep out of the reach of children.
S 13	Keep away from food, drink and animal feedingstuffs.
S 24	Avoid contact with skin.
S 36	Wear suitable protective clothing.
S 46	If swallowed, seek medical advice immediately and show this container or label.

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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J.4 MATERIAL SAFETY DATA SHEET (MAR 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: TANTALUM METAL POWDER, CAPACITOR GRADES 1, 1A, 3, 4, 5

TRADE NAMES/SYNONYMS:

TANTALUM-181; TANTALUM POWDER; TANTALUM; Ta; DLA76954; RTECS WW5505000

CHEMICAL FAMILY: metal

CREATION DATE: Oct 01 1992

REVISION DATE: Mar 16 2006

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TANTALUM
CAS NUMBER: 7440-25-7
EC NUMBER (EINECS): 231-135-5
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=3 REACTIVITY=2

EMERGENCY OVERVIEW:

COLOR: blue to gray

PHYSICAL FORM: solid or powder

ODOR: odorless

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. Extremely flammable. May ignite spontaneously on exposure to air.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: no information on significant adverse effects

LONG TERM EXPOSURE: lung damage

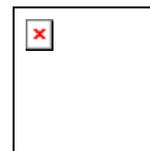
SKIN CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: no information is available

EYE CONTACT:

SHORT TERM EXPOSURE: mild irritation



LONG TERM EXPOSURE: no information on significant adverse effects

INGESTION:

SHORT TERM EXPOSURE: no information on significant adverse effects

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. Finely divided material may ignite spontaneously. May ignite on exposure to air.

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.

LOWER FLAMMABLE LIMIT:

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 material wetted. Store in compatible containers. Store under an oxygen-free liquid (e.g., certain petroleum oils). Keep separated from incompatible substances.

HANDLING: Use methods to minimize dust.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TANTALUM METAL POWDER, CAPACITOR GRADES 1, 1A, 3, 4, 5:

TANTALUM METAL AND OXIDE DUSTS (as Ta):

5 mg/m³ OSHA TWA

5 mg/m³ ACGIH TWA

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

10 mg/m³ NIOSH recommended STEL

4 mg/m³ DFG MAK (inhalable fraction)

1.5 mg/m³ DFG MAK (respirable fraction)

5 mg/m³ UK WEL TWA (metal)

10 mg/m³ UK WEL STEL (metal)

MEASUREMENT METHOD: Particulate filter; Gravimetric; NIOSH IV # 0500, Nuisance Dust (total)

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:

Tantalum (Ta)

25 mg/m³

Any dust and mist respirator.

50 mg/m³

Any dust and mist respirator except single-use and quarter-mask respirators.

Any dust, mist, and fume respirator.

Any supplied-air respirator.

125 mg/m³

Any supplied-air respirator operated in a continuous-flow mode.

Any powered, air-purifying respirator with a dust and mist filter.

250 mg/m³

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

Any supplied-air respirator with a tight-fitting facepiece that is operated in a continuous-flow mode.

Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

2500 mg/m³

Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.

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: blue to gray

PHYSICAL FORM: solid or powder

ODOR: odorless

MOLECULAR WEIGHT: 180.9

MOLECULAR FORMULA: Ta

BOILING POINT: 9797 F (5425 C) approximate

MELTING POINT: 5425 F (2996 C)

VAPOR PRESSURE: 0.0 mmHg @ 20 C

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY (water=1): 16.69

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: hydrofluoric acid, fused alkali, fuming sulfuric acid, nitric acid/hydrofluoric acid mixtures

Insoluble: acids, alkali

10. STABILITY AND REACTIVITY

REACTIVITY: Finely divided material may ignite spontaneously.

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

INCOMPATIBILITIES: halogens, oxidizing materials, acids

TANTALUM:

BROMINE TRIFLUORIDE: Incandescent reaction.

FLUORINE: Ignites on contact.

LEAD CHROMATE: May react explosively.

MINERAL ACIDS: Incompatible.

OXIDIZERS (STRONG): Fire and explosion hazard.

SULFUR TRIOXIDE: Incompatible.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: oxides of tantalum

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TANTALUM METAL POWDER, CAPACITOR GRADES 1, 1A, 3, 4, 5:

TOXICITY DATA:

595 mg/kg oral-mouse LD50

ACUTE TOXICITY LEVEL:

Moderately Toxic: ingestion

TUMORIGENIC DATA:

3760 mg/kg implant-rat TDLo

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

TANTALUM: Insufflation of the metal powder in humans was without adverse effects.

CHRONIC EXPOSURE:

TANTALUM: Repeated or prolonged exposure to tantalum alloys may have caused a mild fibrosis and chronic rhinitis in exposed workers and may play a role in producing "hard metal pneumoconiosis" in workers exposed to tantalum as well as other metals.

SKIN CONTACT:

ACUTE EXPOSURE:

TANTALUM: May cause irritation.

CHRONIC EXPOSURE:

TANTALUM: No data available.

EYE CONTACT:

ACUTE EXPOSURE:

TANTALUM: Dusts may cause slight irritation.

CHRONIC EXPOSURE:

TANTALUM: Implantation of the metal into rabbit eyes for longer than a year has been reported to cause no significant adverse effects.

INGESTION:

ACUTE EXPOSURE:

TANTALUM: Large oral doses of tantalum compounds were well tolerated by rats indicating poor absorption.

CHRONIC EXPOSURE:

TANTALUM: Animal studies indicate absorption may occur.

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. D003.

14. TRANSPORT INFORMATION

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U.S. DOT 49 CFR 172.101:

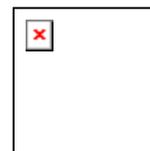
PROPER SHIPPING NAME: Metal powders, flammable, n.o.s.

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.

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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: Yes

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:

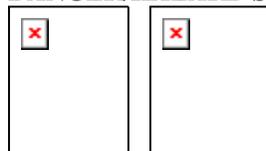
WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED):

F	Highly Flammable
Xn	Harmful

DANGER/HAZARD SYMBOL:



EC RISK AND SAFETY PHRASES:

R 17	Spontaneously flammable in air.
R 22	Harmful if swallowed.
S 2	Keep out of the reach of children.
S 13	Keep away from food, drink and animal feedingstuffs.
S 24	Avoid contact with skin.
S 36	Wear suitable protective clothing.
S 46	If swallowed, seek medical advice immediately and show this container or label.

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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J.4 MATERIAL SAFETY DATA SHEET (MAR 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: TANTALUM MINERALS

TRADE NAMES/SYNONYMS:
DLANA391

CREATION DATE: Jul 24 1992
REVISION DATE: Mar 16 2006

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TITANIUM DIOXIDE
CAS NUMBER: 13463-67-7
EC NUMBER (EINECS): 236-675-5
PERCENTAGE: <20.0

COMPONENT: STANNIC OXIDE
CAS NUMBER: 18282-10-5
EC NUMBER (EINECS): 242-159-0
PERCENTAGE: <20.0

COMPONENT: TANTALUM PENTOXIDE
CAS NUMBER: 1314-61-0
EC NUMBER (EINECS): 215-238-2
PERCENTAGE: >1.0

COMPONENT: NIOBIUM OXIDE
CAS NUMBER: 1313-96-8
EC NUMBER (EINECS): 215-213-6
PERCENTAGE: >1.0

COMPONENT: URANIUM OCTAOXIDE
CAS NUMBER: 1344-59-8
EC NUMBER (EINECS): 215-702-4
PERCENTAGE: <0.8

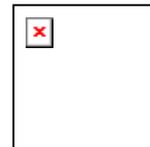
COMPONENT: THORIUM DIOXIDE
CAS NUMBER: 1314-20-1
EC NUMBER (EINECS): 215-225-1
PERCENTAGE: <0.5

COMPONENT: ANTIMONY

CAS NUMBER: 7440-36-0
EC NUMBER (EINECS): 231-146-5
PERCENTAGE: <0.01

3. HAZARDS IDENTIFICATION

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



EMERGENCY OVERVIEW:

PHYSICAL DESCRIPTION: Small sized granular material.

MAJOR HEALTH HAZARDS: cancer hazard (in humans)

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: irritation, metal fume fever, chest pain, difficulty breathing

LONG TERM EXPOSURE: irritation

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

EYE CONTACT:

SHORT TERM EXPOSURE: irritation, tearing

LONG TERM EXPOSURE: irritation

INGESTION:

SHORT TERM EXPOSURE: no information on significant adverse effects

LONG TERM EXPOSURE: no information on significant adverse effects

CARCINOGEN STATUS:

OSHA: No

NTP: Yes

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 hazard.

EXTINGUISHING MEDIA: Use extinguishing agents appropriate for surrounding fire.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

6. ACCIDENTAL RELEASE MEASURES

WATER RELEASE:

Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

OCCUPATIONAL RELEASE:

Large spills: Collect spilled material in appropriate container for disposal. Avoid generating dust. Clean up residue with a high-efficiency particulate filter vacuum. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE

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

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TITANIUM DIOXIDE:

15 mg/m³ OSHA TWA (total dust)
10 mg/m³ OSHA TWA (total particulate) (vacated by 58 FR 35338, June 30, 1993)
10 mg/m³ ACGIH TWA
NIOSH TWA (lowest feasible concentration)
1.5 mg/m³ DFG MAK (respirable fraction)
10 mg/m³ UK WEL TWA (total inhalable dust)
4 mg/m³ UK WEL TWA (respirable dust)

MEASUREMENT METHOD: Particulate filter; Acid; Flame atomic absorption spectrometry; NIOSH II(3) # S385

STANNIC OXIDE:

TIN AND INORGANIC TIN COMPOUNDS (as Sn):

2 mg/m³ OSHA TWA
2 mg/m³ ACGIH TWA
2 mg/m³ NIOSH recommended TWA 10 hour(s)
2 mg/m³ EC OEL
2 mg/m³ UK WEL TWA
4 mg/m³ UK WEL STEL

MEASUREMENT METHOD: Particulate filter; Acid; Inductively coupled plasma; NIOSH IV # 7300, Elements

TANTALUM PENTOXIDE:

TANTALUM METAL AND OXIDE DUSTS (as Ta):

5 mg/m³ OSHA TWA
5 mg/m³ ACGIH TWA
5 mg/m³ NIOSH recommended TWA 10 hour(s)
10 mg/m³ NIOSH recommended STEL
4 mg/m³ DFG MAK (inhalable fraction)
1.5 mg/m³ DFG MAK (respirable fraction)

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5 mg/m³ UK WEL TWA (metal)
10 mg/m³ UK WEL STEL (metal)

MEASUREMENT METHOD: Particulate filter; Gravimetric; NIOSH IV # 0500, Nuisance Dust (total)

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: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. Any dust, mist, and fume respirator.

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

Any powered, air-purifying respirator with a dust, mist, and fume filter.

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

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 DESCRIPTION: Small sized granular material.

BOILING POINT: Not applicable

MELTING POINT: Not available

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY: Not available

WATER SOLUBILITY: Not available

PH: Not applicable

VOLATILITY: Not applicable

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid generating dust.

INCOMPATIBILITIES: metals, halogens, reducing agents

TITANIUM DIOXIDE:

ALUMINUM: Reaction is accompanied by incandescence.

CALCIUM: Reaction is accompanied by incandescence.

LITHIUM: Reaction occurs around 200 C, with incandescence.

MAGNESIUM: Reaction is accompanied by incandescence.

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POTASSIUM: Reaction is accompanied by incandescence.

SODIUM: Reaction is accompanied by incandescence.

ZINC: Reaction is accompanied by incandescence.

TANTALUM PENTOXIDE:

BROMINE TRIFLUORIDE: React vigorously.

CHLORINE TRIFLUORIDE: Reacts violently, producing flame.

LITHIUM: Reaction occurs around 410 C with consequent temperature rise to 595 C.

NIOBIUM OXIDE:

CHLORINE TRIFLUORIDE: Incompatible.

LITHIUM: Reacts violently and exothermically at 320 C to 490 C.

STANNIC OXIDE:

CHLORINE TRIFLUORIDE: Violent reaction, ignition often occurring.

HYDROGEN TRISULFIDE: Possible ignition.

MAGNESIUM: Explodes when heated.

POTASSIUM: Reduced with incandescence.

SODIUM: Reduced with incandescence.

ALUMINUM: Reduced violently or explosively.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TITANIUM DIOXIDE:

IRRITATION DATA:

300 ug/3 day(s)-intermittent skin-human mild

TOXICITY DATA:

6820 mg/m³/4 hour(s) inhalation-rat LC50; >24000 mg/kg oral-rat LD50; >100 ug/kg intratracheal-rat LD; 60 mg/kg oral-rat TDLo; 100 mg/kg intratracheal-mouse TDLo; 250 mg/m³/6 hour(s)-4 week(s) intermittent inhalation-rat TCLo; 50 mg/m³/6 hour(s)-13 week(s) intermittent inhalation-rat TCLo; 10 mg/m³/6 hour(s)-13 week(s) intermittent inhalation-mouse TCLo; 250 mg/m³/6 hour(s)-13 week(s) intermittent inhalation-hamster TCLo

CARCINOGEN STATUS: IARC: Human Inadequate Evidence, Animal Limited Evidence, Group 3; ACGIH: A4 -Not Classifiable as a Human Carcinogen

Increased incidences of lung adenomas in rats of both sexes and of cystic keratinizing lesions diagnosed as squamous-cell carcinomas in female rats were observed in animals that had inhaled high but not low doses of titanium dioxide. Intratracheal administration of titanium dioxide in combination with benzo(a)pyrene to hamsters resulted in an increase in the incidence of benign and malignant tumors of the larynx, trachea and lungs over that in benzo(a)pyrene-treated controls.

ACUTE TOXICITY LEVEL:

Moderately Toxic: inhalation

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: respiratory disorders

TUMORIGENIC DATA:

250 mg/m³ inhalation-rat TCLo/6 hour(s)-2 year(s) intermittent; 360 mg/kg intramuscular-rat TDLo/2 year(s) intermittent; 260 mg/kg intramuscular-rat TD/84 week(s) intermittent; 10 mg/m³ inhalation-rat TC/18 hour(s)-2 year(s) intermittent

MUTAGENIC DATA:

micronucleus test - mouse intraperitoneal 3 gm/kg 3 day(s)-continuous; micronucleus test - hamster ovary 5 umol/L; DNA inhibition - hamster lung 500 mg/L; sister chromatid exchange - hamster ovary 1 umol/L

**DLA-TANTALUM-001
AMENDMENT NO. 008**

STANNIC OXIDE:

TOXICITY DATA:

>20 gm/kg oral-rat LD50; >6600 mg/kg intraperitoneal-rat LD50; >20 gm/kg oral-mouse LD50; >6600 mg/kg intraperitoneal-mouse LD50

ACUTE TOXICITY LEVEL: Insufficient Data.

TANTALUM PENTOXIDE:

TOXICITY DATA:

>5 gm/kg intraperitoneal-rat LD; >4 gm/kg oral-mouse LD50; 8000 mg/kg oral-rat LD50; 4000 mg/kg oral-mouse LD50; 3500 mg/kg intraperitoneal-mouse LD50; 250 mg/kg intratracheal-rat TDLo; 130 mg/m³/2 hour(s)-17 week(s) intermittent inhalation-rat TCLo

ACUTE TOXICITY LEVEL:

Slightly Toxic: ingestion

NIOBIUM OXIDE:

TOXICITY DATA:

>10 gm/kg oral-rat LD; >10 gm/kg intraperitoneal-rat LD; >4 gm/kg oral-mouse LD50; >10 gm/kg intraperitoneal-mouse LD; 4000 mg/kg oral-mouse LD50; 250 mg/kg intratracheal-rat TDLo; 60 gm/kg/6 week(s) intermittent oral-rat TDLo

ACUTE TOXICITY LEVEL:

Moderately Toxic: ingestion

ADDITIONAL DATA: In vitro studies indicate that the inhibition of adenosine triphosphatase may be involved with the biological activity of niobium.

THORIUM DIOXIDE:

TOXICITY DATA:

>1140 mg/kg intratracheal-rat LD50; 8 gm/kg parenteral-mammal TDLo

CARCINOGEN STATUS: NTP: Known Human Carcinogen; EC: Category 1

Intravascular injection in humans produced tumors of the liver, including hepatocellular carcinomas, cholangiocellular carcinomas, carcinomas of the extra-hepatic biliary system, sarcomas, hemangioendotheliomas, reticulum cell sarcomas, carcinomas of the common hepatic duct, adenocarcinomas, liver cell carcinomas, undifferentiated carcinomas, hepatomas, tumors of the kidney, including carcinomas of the renal parenchyma, and sarcomas and carcinomas of the renal pelvis. In addition, carcinomas of the maxillary sinuses, spindle cell sarcomas in the later cervical region, leukemias, and other hematologic disorders have been related to intravascular injection of thorium dioxide. Studies suggest a latency of 21-36 years. A variety of carcinomas have been induced in animals following intravenous, subcutaneous, and submucousal administration.

ACUTE TOXICITY LEVEL: Insufficient Data.

TUMORIGENIC DATA:

1 gm/kg parenteral-woman TDLo; 2880 mg/kg unreported-human TDLo; 490 mg/kg intraarterial-human TDLo; 160 mg/kg intravenous-rat TDLo; 20 gm/kg subcutaneous-mouse TDLo; 10 gm/kg intravenous-mouse TDLo; 400 mg/kg intramuscular-mouse TDLo; 1500 mg/kg intravenous-rabbit TDLo; 4 gm/kg parenteral-guinea pig TDLo/15 week(s) intermittent; 2 gm/kg unreported-hamster TDLo; 3600 mg/kg intravenous-rabbit TD; 300 mg/kg intravenous-rabbit TD/2 year(s) intermittent; 700 mg/kg parenteral-human TD; 1260 mg/kg parenteral-human TD; 2 gm/kg intraarterial-woman TD; 10 mg/kg intravenous-mouse TD; 2350 mg/kg parenteral-woman TD; 1190 mg/kg intraarterial-man TD; 1302 mg/kg intraarterial-human TD

ADDITIONAL DATA: Radioactive.

HEALTH EFFECTS:

INHALATION:

STANNIC OXIDE: May cause chest pain, dyspnea, rales, and leukocytosis. Repeated exposure may cause stannosis, a benign pneumoconiosis, without symptoms of interference of pulmonary function. See information on inorganic tin compounds and metal fume fever.

ACUTE EXPOSURE:

TITANIUM DIOXIDE: Inhalation may cause irritation with cough and sneezing. Nuisance dusts may cause

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unpleasant deposits in the nasal passages.

INORGANIC TIN COMPOUNDS: Exposure to some inorganic tin compounds may result in irritation of the mucous membranes, nose, and throat.

METAL FUME FEVER: Metal fume fever, an influenza-like illness, may occur due to the inhalation of freshly formed metal oxide particles sized below 1.5 microns and usually between 0.02-0.05 microns. Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea and prostration may also occur. Tolerance to fumes develops rapidly, but is quickly lost. All symptoms usually subside within 24-36 hours.

TANTALUM PENTOXIDE: Tantalum dust has a low order of toxicity and is relatively inert. It has produced transient inflammatory lesions in the lungs of animals after severe exposure.

NIOBIUM OXIDE: Dust may cause respiratory irritation.

CHRONIC EXPOSURE:

TITANIUM DIOXIDE: Long-term exposure may cause pulmonary irritation with cough, difficulty breathing, a decline in pulmonary function, and x-ray evidence of mild fibrosis. A few cases of slight fibrosis without disabling injury have been reported from occupational exposure. Rats repeatedly exposed to concentrations of 10-328 million particles/ft³ for as long as 13 months showed small focal areas of emphysema which were attributed to large deposits of dust. Rats exposed to concentrations of 10, 50, and 250 mg/m³ for 6 hours/day, 5 days/week, for 2 years, showed no abnormal clinical signs, body weight changes, or excess mortality in any exposed group. There were, however, dose-dependent increases in the incidence of pneumonia, tracheitis, and rhinitis, with squamous metaplasia in the anterior nasal cavity. At 10 mg/m³, the pulmonary response satisfied the criteria for a nuisance dust. Bronchioalveolar adenomas and cystic keratinizing squamous cell carcinomas occurred only at the 250 mg/m³ level, twenty-five times the threshold limit value. These lung tumors were different from common human lung cancers in terms of tumor type, location, and tumorigenesis, and were devoid of tumor metastasis.

INORGANIC TIN COMPOUNDS: No data available.

METAL FUME FEVER: There is no form of chronic metal fume fever, however, repeated bouts with symptoms as described above are quite common. Resistance to the condition develops after a few days of exposure, but is quickly lost in 1 or 2 days.

TANTALUM PENTOXIDE: Repeated or prolonged exposure to tantalum dust may cause bronchitis.

NIOBIUM OXIDE: No data available.

SKIN CONTACT:

ACUTE EXPOSURE:

TITANIUM DIOXIDE: Topically, it is reported to be devoid of toxicity and chemically non-irritating. However, titanium dioxide may occasionally be so occlusive that it produces miliaria.

STANNIC OXIDE: It is not absorbed and is relatively innocuous to the skin.

TANTALUM PENTOXIDE: May cause irritation.

NIOBIUM OXIDE: May cause irritation.

CHRONIC EXPOSURE:

TITANIUM DIOXIDE: Application of 300 ug for 3 days intermittently to human skin produced mild irritation.

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STANNIC OXIDE: No data available.

TANTALUM PENTOXIDE: No data available.

NIOBIUM OXIDE: No data available.

EYE CONTACT:

ACUTE EXPOSURE:

TITANIUM DIOXIDE: Introduction by tattooing into the cornea of rabbit eyes and patients with corneal scars resulted in permanent white coloration, but no irritation.

STANNIC OXIDE: Particulates in the eye may cause irritation and lacrimation.

TANTALUM PENTOXIDE: May cause slight irritation.

NIOBIUM OXIDE: May cause irritation.

CHRONIC EXPOSURE:

TITANIUM DIOXIDE: No data available.

STANNIC OXIDE: No data available.

TANTALUM PENTOXIDE: No data available.

NIOBIUM OXIDE: Repeated or prolonged contact may cause conjunctivitis.

INGESTION:

ACUTE EXPOSURE:

TITANIUM DIOXIDE: Titanium dioxide has been reported to be physiologically inert. Ingestion of large quantities may cause intestinal obstruction. However, a pound has been ingested without apparent harm or distress.

STANNIC OXIDE: Most tin salts are relatively non-toxic and poorly absorbed through the gastrointestinal tract.

TANTALUM PENTOXIDE: No data available.

NIOBIUM OXIDE: Metallic niobium is poorly absorbed in the stomach and intestines.

CHRONIC EXPOSURE:

TITANIUM DIOXIDE: Mice and rats fed 50,000 and 25,000 ppm for 103 weeks showed no evidence of toxicity and no increased incidence of tumors.

STANNIC OXIDE: Chronic feeding studies utilizing rats for 4-13 weeks at levels of 0.03%, 0.10%, 0.30% and 1.0% percent resulted in no adverse effects.

TANTALUM PENTOXIDE: No data available.

NIOBIUM OXIDE: Metallic niobium in the drinking water at 5 ppm and in the diet at 1.62 mg/kg caused liver degeneration in animal studies.

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):

ANTIMONY: 5000 LBS RQ

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: Yes

FIRE: No

REACTIVE: No

SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65):

THORIUM DIOXIDE

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

STATE REGULATIONS:

California Proposition 65:

Known to the state of California to cause the following:

THORIUM DIOXIDE

Cancer (Feb 27, 1987)

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED): Not determined.

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

11. TOXICOLOGICAL INFORMATION

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J.4 MATERIAL SAFETY DATA SHEET (MAR 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: TANTALUM PENTOXIDE

TRADE NAMES/SYNONYMS:

TANTALUM OXIDE; TANTALIC ACID ANHYDRIDE; TANTALUM PENTA OXIDE; TANTALUM (V) OXIDE; TANTALUM PENTOXIDE ELECTRONIC GRADE (SHIELDALLOY CORPORATION); O5TA2; DLA22450; RTECS WW5855000

CHEMICAL FAMILY: metal oxides

CREATION DATE: Jul 01 1992

REVISION DATE: Mar 16 2006

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TANTALUM PENTOXIDE

CAS NUMBER: 1314-61-0

EC NUMBER (EINECS): 215-238-2

PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

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

EMERGENCY OVERVIEW:

PHYSICAL DESCRIPTION: Odorless, white to yellow microcrystalline, infusible powder, lumps or pieces.

MAJOR HEALTH HAZARDS: No significant target effects reported.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: no information on significant adverse effects

LONG TERM EXPOSURE: no information on significant adverse effects

SKIN CONTACT:

SHORT TERM EXPOSURE: no information on significant adverse effects

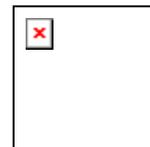
LONG TERM EXPOSURE: no information is available

EYE CONTACT:

SHORT TERM EXPOSURE: mild irritation

LONG TERM EXPOSURE: no information is available

INGESTION:



SHORT TERM EXPOSURE: no information on significant adverse effects

LONG TERM EXPOSURE: no information is available

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 exposed skin with soap and water.

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 hazard.

EXTINGUISHING MEDIA: Use extinguishing agents appropriate for surrounding fire.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Large spills: Collect spilled material in appropriate container for disposal. Avoid generating dust. 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. Store in a tightly closed container. Store in a cool, dry place. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

TANTALUM PENTOXIDE:

TANTALUM METAL AND OXIDE DUSTS (as Ta):

5 mg/m³ OSHA TWA

5 mg/m³ ACGIH TWA

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

10 mg/m³ NIOSH recommended STEL

4 mg/m³ DFG MAK (inhalable fraction)

1.5 mg/m³ DFG MAK (respirable fraction)

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5 mg/m³ UK WEL TWA (metal)
10 mg/m³ UK WEL STEL (metal)

MEASUREMENT METHOD: Particulate filter; Gravimetric; NIOSH IV # 0500, Nuisance Dust (total)

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: Protective clothing is not required.

GLOVES: Protective gloves are not required, but recommended.

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

Measurement Element:

Tantalum (Ta)

25 mg/m³

Any dust and mist respirator.

50 mg/m³

Any dust and mist respirator except single-use and quarter-mask respirators.

Any dust, mist, and fume respirator.

Any supplied-air respirator.

125 mg/m³

Any supplied-air respirator operated in a continuous-flow mode.

Any powered, air-purifying respirator with a dust and mist filter.

250 mg/m³

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

Any supplied-air respirator with a tight-fitting facepiece that is operated in a continuous-flow mode.

Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

2500 mg/m³

Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.

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 DESCRIPTION: Odorless, white to yellow microcrystalline, infusible powder, lumps or pieces.

MOLECULAR WEIGHT: 441.89

MOLECULAR FORMULA: TA₂O₅

BOILING POINT: Not applicable

MELTING POINT: 3384-3420 F (1862-1882 C)

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY (water=1): 8.2

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: hydrofluoric acid
Insoluble: alcohol, mineral acids

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid generating dust.

INCOMPATIBILITIES: halogens, metals

TANTALUM PENTOXIDE:
BROMINE TRIFLUORIDE: React vigorously.
CHLORINE TRIFLUORIDE: Reacts violently, producing flame.
LITHIUM: Reaction occurs around 410 C with consequent temperature rise to 595 C.

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

TANTALUM PENTOXIDE:

TOXICITY DATA:

>5 gm/kg intraperitoneal-rat LD; >4 gm/kg oral-mouse LD50; 8000 mg/kg oral-rat LD50; 4000 mg/kg oral-mouse LD50; 3500 mg/kg intraperitoneal-mouse LD50; 250 mg/kg intratracheal-rat TDLo; 130 mg/m³/2 hour(s)-17 week(s) intermittent inhalation-rat TCLo

ACUTE TOXICITY LEVEL:

Slightly Toxic: ingestion

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

TANTALUM PENTOXIDE: Tantalum dust has a low order of toxicity and is relatively inert. It has produced transient inflammatory lesions in the lungs of animals after severe exposure.

CHRONIC EXPOSURE:

TANTALUM PENTOXIDE: Repeated or prolonged exposure to tantalum dust may cause bronchitis.

SKIN CONTACT:

ACUTE EXPOSURE:

TANTALUM PENTOXIDE: May cause irritation.

CHRONIC EXPOSURE:

TANTALUM PENTOXIDE: No data available.

EYE CONTACT:

ACUTE EXPOSURE:

TANTALUM PENTOXIDE: May cause slight irritation.

CHRONIC EXPOSURE:

TANTALUM PENTOXIDE: No data available.

INGESTION:

ACUTE EXPOSURE:

TANTALUM PENTOXIDE: No data available.

CHRONIC EXPOSURE:

TANTALUM PENTOXIDE: No data available.

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):

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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.

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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