

4/0- 7102

3/17/97



SHIELDALLOY METALLURGICAL CORPORATION

WEST BOULEVARD  
P.O. BOX 768  
NEWFIELD, NJ 08344  
TELEPHONE (609) 692-4200  
FAX (609) 692-4017

March 6, 1997

Mr. Michael F. Weber  
USNRC  
Mail Stop T-8D16  
Washington DC 20555

Dear Mr. Weber:

Please consider this letter a license amendment request for the Shieldalloy Metallurgical Corporation facility in Newfield New Jersey operating under NRC license number SMB-743.

Currently the license states under section 9 that the authorized use for uranium and thorium is "For possession and storage incident to the processing of raw materials to produce ferrocolumbium and columbium nickel alloys."

SMC requests that the license be amended to allow for the possession and storage of materials containing uranium and thorium when these materials would not be used for production at the site, but would be sold to other licensees as a tradeable commodity. SMC agrees that the amount of uranium and thorium contained in these materials would be added to the current inventory of uranium and thorium at the site until they were sold and removed from the site. All other conditions of the license, as it has been amended from time to time, including the maximum possession amount of uranium and thorium permitted under the amended license would remain unchanged.

The material under consideration is tantalum minerals which will be stored in one of the currently restricted area warehouses on the site. These warehouses have been used for the storage of pyrochlore and are included in the areas covered by monitoring as part of SMC's radiation protection program.

SMC believes that given the current market conditions and the cost of this material, the tantalum minerals will be sold within a two year period.

The temporary presence of these materials on the SMC site will not have an impact on the required financial assurance component of the license. The reason for this lack of impact is these materials are a saleable commodity and would not need to be disposed of as a waste, so no financial assurance to cover disposal is necessary.

Attached is a copy of the Material Safety Data Sheet for this material as well as the tabulated results of some chemical analyses. You will note that for any one lot, the maximum concentration of uranium is 0.322% with an average of all lots of 0.046%, and the maximum

NRCS\_5.WPD

NIL 10%

9703280333 970306  
PDR ADOCK 04007102  
C PDR



concentration of thorium is 0.158% with an average of all lots of 0.039%. These concentrations are not very different from those found in the pyrochlore raw material used at the facility.

Due to the pressing nature of this business opportunity, SMC requests an expedited review of this amendment request. If you have any questions or need additional information, please do not hesitate to contact me.

Very truly yours,



C. Scott Eves  
Vice President  
Environmental Services

cc: E. Shondorf  
R. Bromwell  
E. Jackson  
D. Henderson  
M. Higgins  
J. Valenti

J.1 - TANTALUM MINERALS ANALYSIS

Storage Location : HAMMOND, IN

Item No.	Contract Number	Lot No.	No. of Drums	Country of Origin	Ta2O5	Cb2O5	% by Weight							Bulk Wt. (lbs.)	Cb (lbs.)	Ta (lbs.)	Ta2O5 (lbs.)	Cb2O5 (lbs.)	
							SnO2	TiO2	Sb	U3O	U	ThO2	Th						h+
1	81C-0004	212	22	W Germany	39.36%	32.69	1.8	2.1	< .01	0.02	0.017	0.03	0.026	0.04	31,104.70	7,108	10,026	12,242.81	10,168.13
2	84C-1001	001	57	Mixed	44.52%	33.77	2.83	1.52	0.01	0.01	0.005	0.013	0.011	0.02	28,500.00	6,728	10,391	12,688.20	9,624.45
3	84C-1001	002	83	Mixed	45.67%	34.39	2.04	1.29	0	0.01	0.009	0.005	0.004	0.01	41,500.00	9,977	15,522	18,953.05	14,271.85
4	84C-1001	003	83	Mixed	47.52%	32.20	2.42	1.6	0.01	0.01	0.008	0.008	0.007	0.01	41,500.00	9,341	16,151	19,720.80	13,363.00
5	84C-1002	001	77	Mixed	42.405%	22.37	2.84	2.91	0	0.04	0.035	0.011	0.01	0.04	38,300.00	5,989	13,301	16,241.12	8,567.71
6	84C-1002	003	78	Mixed	33.51%	31.96	3.88	3.6	0	0.02	0.018	0.001	9E-04	0.02	38,759.00	8,659	10,637	12,988.14	12,387.38
7	84C-1003	002	32	Mixed	34.36%	33.24	4.65	3.53	0	0.03	0.026	0.026	0.023	0.05	15,802.00	3,672	4,447	5,429.57	5,252.58
8	84C-1003	004	30	Mixed	36.76%	31.35	5.44	4.25	< .01	0.01	0.006	0.019	0.017	0.02	15,055.00	3,299	4,532	5,534.22	4,719.74
9	84C-1003	006	28	Mixed	36.30%	28.70	5.66	4.48	< .01	0.01	0.009	0.028	0.025	0.03	14,132.00	2,835	4,201	5,129.92	4,055.88
10	81C-0004	214	10	Mixed	43.18%	20.95	5.9	3.6	< .01	0.15	0.127	0.13	0.114	0.24	14,220	2,082	5,029	6,140.05	2,979.02
11	81C-0004	216	15	Mixed	30.02%	27.35	5.1	3.7	< .01	0.09	0.076	0.14	0.123	0.2	21,305.25	4,073	5,238	6,395.84	5,826.99
12	84C-1001	004	74	Mixed	55.23%	24.03	3.23	1.25	0	0.38	0.322	0.01	0.009	0.33	36,813.00	6,184	16,651	20,331.82	8,846.16
13	84C-1001	005	79	Mixed	41.92%	37.78	5.94	1.96	0	0.05	0.039	0.11	0.097	0.14	39,230.00	10,361	13,468	16,445.22	14,821.09
14	84C-1001	006	94	Mixed	34.35%	32.10	4.24	1.86	0	0.08	0.065	0.18	0.158	0.22	46,925.00	10,530	13,201	16,118.74	15,062.93
15	84C-1001	007	93	Mixed	42.50%	37.38	4.56	1.84	0	0.03	0.023	0.082	0.072	0.09	46,154.00	12,060	16,064	19,615.45	17,252.37
16	84C-1002	002	88	Mixed	36.60%	35.02	2.96	1.71	0	0.06	0.047	0.008	0.007	0.05	44,000.00	10,771	13,189	16,104.00	15,408.80
17	84C-1003	001	30	Mixed	34.94%	32.56	4.67	3.58	0	0.06	0.049	0.009	0.008	0.06	15,000.00	3,414	4,292	5,241.00	4,884.00
18	84C-1003	003	16	Mixed	42.72%	35.97	3.8	2.48	0	0.03	0.022	0.033	0.029	0.05	7,934.00	1,995	2,776	3,389.40	2,853.86
19	84C-1003	005	30	Mixed	36.82%	33.84	5.38	4.39	0	0.06	0.049	0.008	0.007	0.06	15,016.00	3,552	4,528	5,528.89	5,081.41
20	84C-1003	014	88	Mixed	33.34%	30.09	4.39	3.57	0	0.02	0.02	0.072	0.063	0.08	43,633	9,178	11,914	14,547.24	13,129.17
21	84C-1003	015	5	Mixed	38.93%	24.62	3.46	3.31	0	0.02	0.018	0.038	0.033	0.05	4,402	758	1,403	1,713.70	1,083.77
22	84C-1003	016	3	Mixed	37.84%	26.05	2.81	3.1	0	0.04	0.037	0.027	0.024	0.06	1,500	367	465	567.60	390.75
															600,785	132,934	197,426	241,067	190,031

**J.2 REGION/STORAGE INFORMATION**

<u>OUTLOADING HOURS</u>	<u>DAYS</u>	<u>SITE</u>	<u>AVAILABLE TRANSPORTATION</u>	<u>REGION</u>
0715-1515	Mon-Thr	3200 Sheffield Ave	Truck	West
0815-1515	Fri	Hammond, IN 46327-1002 Phone: 219-937-5265 Fax: 219-937-5265		

**Region Management Office:**

Operations West:

Mr. Dennis Lynch  
Defense Logistics Agency  
Defense National Stockpile Center DNSC-MOW  
8725 John J. Kingman Road, Suite 3339  
Fort Belvoir, VA 22060-6223  
Telephone: (703) 767-7609

Shipping Request Number \_\_\_\_\_

**SHIPPING INSTRUCTIONS**

1. a. Contractor: \_\_\_\_\_

b. Point of Contact: \_\_\_\_\_ c. Telephone No.: \_\_\_\_\_

2. a. DNSC Contract No.: SPO833-97-S- b. Commodity: \_\_\_\_\_

3. Item/Pile: \_\_\_\_\_

4. Depot: \_\_\_\_\_

5. a. Quantity: \_\_\_\_\_

b. Unit Price: \_\_\_\_\_ c. Total Dollar Value: \_\_\_\_\_

6. Shipping Method: \_\_\_\_\_

7. a. Carrier Name: \_\_\_\_\_

b. Point of Contact: \_\_\_\_\_ c. Telephone No.: \_\_\_\_\_

8. Date Shipment Desired: \_\_\_\_\_

9. Ship To: \_\_\_\_\_

10. Minimum Load: \_\_\_\_\_

11. a. Outloader: \_\_\_\_\_ b. Telephone No.: \_\_\_\_\_

12. a. Sampler: \_\_\_\_\_ b. Telephone No.: \_\_\_\_\_

13. Copy of Payment Attached: Yes \_\_\_\_\_ No \_\_\_\_\_

14. Remarks: \_\_\_\_\_

15. Contractor's Signature: \_\_\_\_\_

Date

Telephone

16. Release Approved and Authorized: \_\_\_\_\_

Contracting Officer

Date

## SECTION 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

FOR EMERGENCY SOURCE INFORMATION  
CONTACT: 1-615-366-2000

SUBSTANCE: TANTALUM MINERALS

TRADE NAMES/SYNONYMS:  
DLANA391

CHEMICAL FAMILY:  
Mixture

CREATION DATE: 07/24/92

REVISION DATE: 07/02/96

## SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: TITANIUM DIOXIDE  
CAS NUMBER: 13463-67-7  
PERCENTAGE: <20.0

COMPONENT: STANNIC OXIDE  
CAS NUMBER: 18282-10-5  
PERCENTAGE: <20.0

COMPONENT: TANTALUM PENTOXIDE  
CAS NUMBER: 1314-61-0  
PERCENTAGE: >1.0

COMPONENT: NIOBIUM OXIDE  
CAS NUMBER: 1313-96-8  
PERCENTAGE: >1.0

COMPONENT: URANIUM OCTAOXIDE  
CAS NUMBER: 1344-59-8  
PERCENTAGE: <0.8

COMPONENT: THORIUM DIOXIDE  
CAS NUMBER: 1314-20-1  
PERCENTAGE: <0.5

COMPONENT: ANTIMONY  
CAS NUMBER: 7440-36-0  
PERCENTAGE: <0.01

## SECTION 3 HAZARDS IDENTIFICATION

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

EMERGENCY OVERVIEW:

Small sized granular material.

Cancer hazard (contains material which can cause cancer in humans). Risk of cancer depends on duration and level of exposure.

Do not breathe dust. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EFFECTS: May cause irritation. Additional effects may include metallic taste, chills, fever, nausea, vomiting, diarrhea, frequent urination, chest pain, difficulty breathing, headache and lung damage.

LONG TERM EFFECTS: In addition to effects from short term exposure, lung effects may occur. May also cause tumors.

SKIN CONTACT:

SHORT TERM EFFECTS: May cause irritation.

LONG TERM EFFECTS: No information available on significant adverse effects.

EYE CONTACT:

SHORT TERM EFFECTS: May cause irritation. Additional effects may include tearing.

LONG TERM EFFECTS: Same effects as short term exposure.

INGESTION:

SHORT TERM EFFECTS: No information available on significant adverse effects.

LONG TERM EFFECTS: No information available on significant adverse effects.

ADDITIONAL DATA: May cause cancer.

CARCINOGEN STATUS:

OSHA: N

NTP: Y

IARC: N

SECTION 4

FIRST AID MEASURES

INHALATION:

FIRST AID- Remove from exposure area to fresh air immediately. Perform artificial respiration if necessary. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

SKIN CONTACT:

FIRST AID- Remove contaminated clothing and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

EYE CONTACT:

FIRST AID- Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

INGESTION:

FIRST AID- If vomiting occurs, keep head lower than hips to help prevent aspiration. Treat symptomatically and supportively. Get medical attention if needed.

## SECTION 5

## FIRE FIGHTING MEASURES

## FIRE AND EXPLOSION HAZARD:

The fire hazard for this product has not been determined. The hazard(s) of the component(s) with the most severe hazard(s) are described below.

Negligible fire hazard when exposed to heat or flame.

## EXTINGUISHING MEDIA:

Extinguish using agent suitable for type of surrounding fire.

## FIREFIGHTING:

No acute hazard. Move container from fire area if possible. Avoid breathing vapors or dusts; keep upwind.

FLASH POINT: no data available

LOWER FLAMMABLE LIMIT: no data available

UPPER FLAMMABLE LIMIT: no data available

AUTOIGNITION: no data available

## HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition may release toxic and/or hazardous gases.

## SECTION 6

## ACCIDENTAL RELEASE MEASURES

## OCCUPATIONAL SPILL:

For large spills, sweep up with a minimum of dusting and place into suitable clean, dry containers for reclamation or later disposal.

Residue should be cleaned up using a high-efficiency particulate filter vacuum.

## WATER SPILL:

The California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) prohibits contaminating any known source of drinking water with substances known to cause cancer and/or reproductive toxicity.

## SECTION 7

## HANDLING AND STORAGE

Observe all federal, state and local regulations when storing this substance.

Store away from incompatible substances.

## SECTION 8

## EXPOSURE CONTROLS, PERSONAL PROTECTION

## EXPOSURE LIMITS:

## TITANIUM DIOXIDE:

15 mg/m<sup>3</sup> OSHA TWA (total dust)

10 mg/m<sup>3</sup> OSHA TWA (total dust) (vacated by 58 FR 35338, June 30, 1993)

10 mg/m<sup>3</sup> ACGIH TWA

ACGIH A4-Not Classifiable as a Human Carcinogen (Proposed Addition 1995-96)

6 mg/m<sup>3</sup> DFG MAK TWA (fine dust)

Measurement method: Particulate filter; acid; atomic absorption spectrometry; (NIOSH II(3) # S385).

TIN AND INORGANIC TIN COMPOUNDS (as Sn):

2 mg/m3 OSHA TWA  
2 mg/m3 ACGIH TWA  
2 mg/m3 NIOSH recommended 10 hour TWA  
2 mg/m3 DFG MAK TWA (total dust);  
4 mg/m3 DFG MAK 30 minute peak, average value, 4 times/shift

Measurement method: Particulate filter; acid; atomic absorption spectrometry; (NIOSH II(3) # S183).

TANTALUM METAL AND OXIDE DUSTS (as Ta):

5 mg/m3 OSHA TWA  
5 mg/m3 ACGIH TWA  
5 mg/m3 NIOSH recommended 10 hour TWA;  
10 mg/m3 NIOSH recommended STEL  
5 mg/m3 DFG MAK TWA (total dust);  
50 mg/m3 DFG MAK 30 minute peak, average value, 1 time/shift

Measurement method: Particulate filter; gravimetric; (NIOSH Vol. III # 0500, nuisance dust (total)).

NUISANCE PARTICULATES (NUISANCE DUST):

5 mg/m3 OSHA TWA (respirable dust); 15 mg/m3 OSHA TWA (total dust)  
10 mg/m3 ACGIH TWA (total dust) (no asbestos and < 1% crystalline silica);  
(Notice of Intended Changes 1994-95)

Measurement method: Particulate filter; gravimetric; (NIOSH III Nuisance dust # 0500 (total), # 0600 (respirable)).

THORIUM DIOXIDE:

Subject to SARA Section 313 Annual Toxic Chemical Release Reporting  
Subject to California Proposition 65 cancer and/or reproductive toxicity warning and release requirements- (February 27, 1987)

VENTILATION:

Provide local exhaust ventilation system to meet published exposure limits.

EYE PROTECTION:

Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

Emergency eye wash: Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

CLOTHING:

Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

**GLOVES:**

Employee must wear appropriate protective gloves to prevent contact with this substance.

**RESPIRATOR:**

The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection.

The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

Any dust, mist, and fume respirator.

Any chemical cartridge respirator with a dust, mist, and fume filter.

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

Any type 'C' supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode or with a full facepiece, helmet or hood operated in continuous-flow mode.

Any self-contained breathing apparatus with a full face piece operated in pressure-demand or other positive pressure mode.

**FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:**

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

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**SECTION 9****PHYSICAL AND CHEMICAL PROPERTIES**  
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DESCRIPTION: Small sized granular material.

BOILING POINT: not applicable

MELTING POINT: no data available

VAPOR PRESSURE: no data available

VAPOR DENSITY: not applicable

SPECIFIC GRAVITY: no data available

WATER SOLUBILITY: no data available

PH: not applicable

ODOR THRESHOLD: no data available

EVAPORATION RATE: not applicable

## SECTION 10

## STABILITY AND REACTIVITY

## REACTIVITY:

Stable under normal temperatures and pressures.

## CONDITIONS TO AVOID:

Prevent dispersion of dust in air.

## INCOMPATIBILITIES:

## TITANIUM DIOXIDE:

ALUMINUM: Reduction is accompanied by incandescence.

CALCIUM: Reaction is accompanied by incandescence.

LITHIUM: Reaction occurs around 200 C, with incandescence.

MAGNESIUM: Reaction is accompanied by incandescence.

POTASSIUM: Reaction is accompanied by incandescence.

SODIUM: Reaction is accompanied by incandescence.

ZINC: Reaction is accompanied by incandescence.

## 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.

## 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.

## HAZARDOUS DECOMPOSITION:

Thermal decomposition may release toxic and/or hazardous gases.

## POLYMERIZATION:

Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

## SECTION 11

## TOXICOLOGICAL INFORMATION

## TITANIUM DIOXIDE:

IRRITATION DATA: 300 ug/3 days intermittent skin-human mild.

TOXICITY DATA: 6820 mg/m<sup>3</sup>/4 hours inhalation-rat LC50 (Dudick, Inc. MSDS); >24000 mg/kg oral-rat LD50 (Dudick, Inc. MSDS); mutagenic data (RTECS); tumorigenic data (RTECS).

CARCINOGEN STATUS: Human Inadequate Evidence; Animal Limited Evidence (IARC Group-3). 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 by inhalation; relatively non-toxic by ingestion.

TARGET EFFECTS: No data available.

INCREASED RISK FROM EXPOSURE: Persons with chronic respiratory disease.

TANNIC OXIDE:

ARCINOGEN STATUS: None.

ACUTE TOXICITY LEVEL: No data available.

TARGET EFFECTS: No data available.

TANTALUM PENTOXIDE:

TOXICITY DATA: 8 gm/kg oral-rat LD50; >4 gm/kg oral-mouse LD50.

ARCINOGEN STATUS: None.

ACUTE TOXICITY LEVEL: Slightly toxic by ingestion.

TARGET EFFECTS: Poisoning may affect the respiratory system.

NIObIUM OXIDE:

TOXICITY DATA: >4 gm/kg oral-mouse LD50.

ARCINOGEN STATUS: None.

ACUTE TOXICITY LEVEL: Moderately toxic by ingestion.

TARGET EFFECTS: No data available.

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; Tumorigenic data (RTECS).

ARCINOGEN STATUS: Known Human Carcinogen (NTP). 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 submucosal administration.

ACUTE TOXICITY LEVEL: Insufficient data.

TARGET EFFECTS: No data available.

ADDITIONAL DATA: Radioactive.

HEALTH EFFECTS

INHALATION:

TITANIUM DIOXIDE:

LIMITED ANIMAL CARCINOGEN.

1000 mg/m<sup>3</sup> Immediately Dangerous to Life or Health.

ACUTE EXPOSURE- Inhalation may cause irritation and coughing. Nuisance dusts may cause unpleasant deposits in the nasal passages.

CHRONIC EXPOSURE- 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/ft<sup>3</sup> 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 0, 10, 50, and 250 mg/m<sup>3</sup> 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/m<sup>3</sup>, the pulmonary response satisfied the criteria for a nuisance dust. Bronchioalveolar adenomas and cystic keratinizing squamous cell carcinomas occurred only at the 250 mg/m<sup>3</sup> 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.

#### 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.

#### INORGANIC TIN COMPOUNDS:

100 mg(Sn)/m<sup>3</sup> Immediately Dangerous to Life or Health.

ACUTE EXPOSURE- Exposure to some inorganic tin compounds may result in irritation of the mucous membranes, nose, and throat.

CHRONIC EXPOSURE- No data available.

#### METAL FUME FEVER:

ACUTE EXPOSURE- 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.

CHRONIC EXPOSURE- 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:

ACUTE EXPOSURE- 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- Repeated or prolonged exposure of tantalum dust may cause bronchitis.

## NIOBIUM OXIDE:

ACUTE EXPOSURE- Dust may cause respiratory irritation.

CHRONIC EXPOSURE- None known in humans.

## SKIN CONTACT:

## TITANIUM DIOXIDE:

ACUTE EXPOSURE- 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.

CHRONIC EXPOSURE- Application of 300 ug for 3 days intermittently to human skin produced mild irritation.

## STANNIC OXIDE:

ACUTE EXPOSURE- It is not absorbed and is relatively innocuous to the skin.

CHRONIC EXPOSURE- No data available.

## TANTALUM PENTOXIDE:

ACUTE EXPOSURE- Some tantalum compounds have been suspected of causing skin irritation.

CHRONIC EXPOSURE- No data available.

## NIOBIUM OXIDE:

ACUTE EXPOSURE- No irritating effects have been reported in humans.

Some niobium compounds may irritate the skin.

CHRONIC EXPOSURE- No data available.

## EYE CONTACT:

## TITANIUM DIOXIDE:

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

CHRONIC EXPOSURE- No data available.

## STANNIC OXIDE:

ACUTE EXPOSURE- Particulates in the eye may cause lacrimation.

CHRONIC EXPOSURE- No data available.

## TANTALUM PENTOXIDE:

ACUTE EXPOSURE- May cause slight irritation but not known to be an irritant.

CHRONIC EXPOSURE- No data available.

## NIOBIUM OXIDE:

ACUTE EXPOSURE- May cause irritation.

CHRONIC EXPOSURE- No effects reported, may cause conjunctivitis.

## INGESTION:

## TITANIUM DIOXIDE:

ACUTE EXPOSURE- 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.

CHRONIC EXPOSURE- 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:

ACUTE EXPOSURE- Most tin salts are relatively non-toxic and poorly absorbed through the gastrointestinal tract.

CHRONIC EXPOSURE- Rat feeding studies for 4-13 weeks at levels of 0.03, 0.10, 0.30 and 1.0 percent or for any level up to 7900 ppm, resulted in no adverse effects.

## TANTALUM PENTOXIDE:

ACUTE EXPOSURE- The lethal dose reported in rats is 4500 mg/kg.

CHRONIC EXPOSURE- No data available.

## NIOBIUM OXIDE:

ACUTE EXPOSURE- No specific data available. Metallic niobium has a low order of toxicity because it is poorly absorbed in the stomach and intestines.

CHRONIC EXPOSURE- Niobium in the drinking water at 5 ppm plus 1.62 mg/kg in the diet caused liver degeneration.

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| SECTION 12 ECOLOGICAL INFORMATION |

ENVIRONMENTAL IMPACT RATING (0-4): no data available

ACUTE AQUATIC TOXICITY: no data available

DEGRADABILITY: no data available

LOG BIOCONCENTRATION FACTOR (BCF): no data available

LOG OCTANOL/WATER PARTITION COEFFICIENT: no data available

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| SECTION 13 DISPOSAL CONSIDERATIONS |

Observe all federal, state and local regulations when disposing of this substance.

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| SECTION 14 TRANSPORT INFORMATION |

No classification currently assigned

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| SECTION 15 REGULATORY INFORMATION |

TSCA INVENTORY STATUS: Y

TSCA SECTION 12(b) EXPORT NOTIFICATION:  
Not Listed.

CERCLA SECTION 103 (40CFR302.4): Y

ANTIMONY

5000 pounds RQ

SARA SECTION 302 (40CFR355.30): N

SARA SECTION 304 (40CFR355.40): N

SARA SECTION 313 (40CFR372.65): Y

THORIUM DIOXIDE

OSHA PROCESS SAFETY (29CFR1910.119): N

CALIFORNIA PROPOSITION 65: Y  
THORIUM DIOXIDE

HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21)  
ACUTE HAZARD: N  
CHRONIC HAZARD: Y  
CANCER HAZARD: N  
CORROSIVITY HAZARD: N  
ENVIRONMENTAL RELEASE HAZARD: N

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SECTION 16OTHER INFORMATION  
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The hazards reflected in this MSDS are based only on the identified components and percentages and may not necessarily fully reflect all of the hazards of the product due to the fact that the balance of the composition of the product has not been revealed by the manufacturer.

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FEDWIRE PROCEDURES

Standard operating procedures for sending money via Fedwire Money Transfer System.

Sender must go to a bank that offers wire transfer to the Riggs Bank located in New York, NY. The money will then be transferred to the Defense National Stockpile Account with the Department of Treasury.

EXAMPLE #1 BLANK DEPOSIT SLIP TO BE PROVIDED BY THE SENDING BANK

(1)			
To (2)	Type (3)		
021030004			
FROM (4)	REF (5)	REF (6)	AMOUNT (7)
ORDERING BANK AND RELATED DATA (8)			
(9)	(10)	(11)	
TREAS NYC/ ( )			
(12)			
(12)			
(12)			

PROCEDURES FOR DEPOSITS SLIP(S) FOR FEDWIRE

ITEM #1 - Priority Code - This code will be provided by the sending Bank.

ITEM #2 - Treasury Dept. Code - Routing no. to the Treasury -  
MUST BE ON SLIP "021030004".

ITEM #3 - Type Code --- Provided by sending bank.

ITEM #4 - Sending Bank Code - Provided by sending Bank (Optional)

ITEM #5 - Class Code - Provided by sending Bank.

ITEM #6 - Reference Number - Provided by sending Bank.

ITEM #7 - Amount - Amount of transfer.

ITEM #8 - Sending Bank Name - Name of Sending Bank .

ITEMS #9-10-11 - Treasury Department Name - This item is critical -  
MUST APPEAR EXACTLY AS SHOWN-  
**TREAS NYC/( CTR/BNF=/AC-00006355)**

ITEM #12 - Third Party Information - Purchasers Name, Commodity Purchased,  
Purchasers Contract Number.

EXAMPLE #2 DEPOSIT SLIP COMPLETED WITH THE DNSC PROVIDED INFORMATION, ALL OTHER INFORMATION PROVIDED BY SENDING BANK.

(1)			
To (2)	Type	(3)	
021030004			
FROM	REF.	AMOUNT	
(4)	(5) (6)	(7)	
ORDERING BANK AND RELATED DATA			
(8) NAME OF SENDING BANK			
(9)	(10)	(11)	
TREAS NYC/ (CTR/BNF=/AC-00006355 )			97X4555
(12) CONTRACTORS NAME			
(12) COMMODITY PURCHASED			
(12) CONTRACT NUMBER PAYMENT MADE AGAINST			