SUPPLIER

MATERION

MATERIAL SAFETY DATA SHEET

GENERATED 03/15/2011, **REVISION** 11/12/2007, **SUPERCEDES REVISION** 12/15/2004, **DATE CREATED** 10/25/1992

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION
Titanium metal, powder and pieces (>75 microns)

PRODUCT CODE: T-MSDS0037

PRODUCT NAME: Titanium metal, powder and pieces (>75 microns)

REFERENCE #: 7440-32-6

MANUFACTURER INFORMATION

COMPANY NAME: Materion Advanced Chemicals Inc.
1316 W. St. Paul Avenue
Milwaukee, WI 53233

EMERGENCY CONTACT: CHEMTREC (800)424-9300

ALTERNATE EMERGENCY CONTACT: Materion Advanced Chemicals Inc. (414)289-9800

CHEMICAL FAMILY: Metal

CAS NUMBER: 7440-32-6

RTECS #: XR1700000

UPC/EAN: 231-142-3

SYNONYMS

Titanium metal; contimet 30; C.P. titanium; IMI 115; NCI-CO4251; oremet; titanium alloy.

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS
Titanium metal, powder and pieces (>75 microns)

Hazardous Components (Chemical Name)	CAS #	Concentration	OSHA PEL	ACGIH TLV	Other Limits
Titanium	7440-32-6	0.0 -100.0 %	NE	NE	NE

See SECTION 16-Other Information	NA	0.0 -100.0 %

SECTION 3. HAZARDS IDENTIFICATION
Titanium metal, powder and pieces (>75 microns)

EMERGENCY OVERVIEW

THIS MATERIAL IS CONSIDERED TO BE PHYSIOLOGICALLY INERT.

ROUTE(S) OF ENTRY: Inhalation? Yes , Skin? No , Eyes? No , Ingestion? No Other: N

POTENTIAL HEALTH EFFECTS (ACUTE AND CHRONIC)

TITANIUM: This material is generally considered to be physiologically inert. There are no reported cases in the literature where titanium as such has caused human intoxication. The dusts of titanium or most titanium compounds such as titanium oxide may be placed in the nuisance category. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

INHALATION:
Acute: Prolonged inhalation may cause mild irritation to the lungs and respiratory tract.
Chronic: May cause fibrotic lung changes.

INGESTION:
Acute: Relatively non-toxic, poorly absorbed from the ailmentary tract.
Chronic: No chronic health effects recorded.

SKIN: Acute: May cause abbrasive irritation.
Chronic: No chronic health effects recorded.

EYE:
Acute: May cause abbrasive irritation.
Chronic: No chronic health effects recorded.

TARGET ORGANS: No target organs recorded.

RECOMMENDED EXPOSURE LIMITS

See "Section II"

LD 50 / LC 50

See "Carcinogenicity/Other Information"

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: Prolonged exposure may cause a red, dry, throat, coughing and shortness of breath.
INGESTION: No acute or chronic health effects recorded.

SKIN: May cause redness and itching.

EYE: May cause redness, itching and watering.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

None recorded.

SECTION 4. FIRST AID MEASURES
Titanium metal, powder and pieces (>75 microns)

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention if symptoms persist.

INGESTION: Give 1-2 glasses of milk or water and induce vomiting; Never induce vomiting or give anything by mouth to an unconscious person.

SKIN: Remove contaminated clothing; brush material off skin; wash affected area with mild soap and water; seek medical attention if symptoms persist.

EYE: Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention if symptoms persist.

SECTION 5. FIRE FIGHTING MEASURES
Titanium metal, powder and pieces (>75 microns)

FLASH PT:	N.A.
EXPLOSIVE LIMITS:	LEL: NA UEL: NA
AUTOIGNITION PT:	1200.00 C

FIRE FIGHTING INSTRUCTIONS

Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

FLAMMABLE PROPERTIES AND HAZARDS

May burn in an atmosphere of carbon dioxide, nitrogen or air.
May react violently with BrF3; CuO; PbO; (Ni + KClO3), metaloxy salts; halocarbons; halogens; CO2 metal carbonates; Al; AgF; O2; nitryl fluoride; HNO3; O2; KClO3; KNO3; KMnO4; steam at 704F; trichloroethylene; trichlorotri-fluoroethane. Titanium, in the absence of moisture, burns slowely, but evolves much heat.
Water applied to hot titanium may evolve hydrogen, causing an explosion.

HAZARDOUS COMBUSTION PRODUCTS

EXTINGUISHING MEDIA

AUTOIGNITION POINT: 1200C for solid metal in air
250C for powder in air
USE: Class D, inert gas (argon or helium) or other metal extinguishing agent.
DO NOT USE: Water or carbon dioxide. Water applied to hot titanium may evolve hydrogen, causing an explosion.

UNSUITABLE EXTINGUISHING MEDIA

SECTION 6. ACCIDENTAL RELEASE MEASURES
Titanium metal, powder and pieces (>75 microns)

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wear appropriate respiratory and protective equipment specified in section VIII-control measures. Isolate spill area and provide ventilation. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

SECTION 7. HANDLING AND STORAGE
Titanium metal, powder and pieces (>75 microns)

HAZARD LABEL INFORMATION:

Store in cool, dry area Store in tightly sealed container Wash thoroughly after handling

PRECAUTIONS TO BE TAKEN IN HANDLING

Do not disperse powder or dust in air.

PRECAUTIONS TO BE TAKEN IN STORING

None

OTHER PRECAUTIONS

None

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION
Titanium metal, powder and pieces (>75 microns)

PROTECTIVE EQUIPMENT SUMMARY - HAZARD LABEL INFORMATION:

NIOSH approved respirator Impervious gloves Safety glasses

RESPIRATORY EQUIPMENT (SPECIFY TYPE)

NIOSH approved respirator

EYE PROTECTION

Safety glasses

PROTECTIVE GLOVES

Rubber gloves

OTHER PROTECTIVE CLOTHING

Protective gear suitable to prevent contamination

ENGINEERING CONTROLS (VENTILATION ETC.)

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels.

Powders under 74 microns are flammable.

WORK/HYGIENIC/MAINTENANCE PRACTICES

Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES
Titanium metal, powder and pieces (>75 microns)

PHYSICAL STATES:	[ ] Gas [ ] Liquid [X] Solid
MELTING POINT:	1650.00 C - 1670.00 C
BOILING POINT:	3287.00 C
AUTOIGNITION PT:	1200.00 C
FLASH PT:	N.A.
EXPLOSIVE LIMITS:	LEL: NA UEL: NA
SPECIFIC GRAVITY (WATER = 1):	4.5 at 20.0 C
VAPOR PRESSURE (VS. AIR OR MM HG):	0 at 20.0 C
VAPOR DENSITY (VS. AIR = 1):	
EVAPORATION RATE (VS BUTYL ACETATE=1):	
SOLUBILITY IN WATER:	insoluble

SOLUBILITY NOTES

decomposes steam at 700-800C

PERCENT VOLATILE:	N.A.
FORMULA:	Ti

MOLECULAR WEIGHT: 47.88

APPEARANCE AND ODOR

Dark gray powder or silver-gray pieces, no odor.

SECTION 10. STABILITY AND REACTIVITY
Titanium metal, powder and pieces (>75 microns)

STABILITY: Unstable [ ] Stable [X]

CONDITIONS TO AVOID - INSTABILITY

Dispersion in air

INCOMPATIBILITY - MATERIALS TO AVOID

TITANIUM: Air, BrF_3, CuO, PbO, (Ni + $KClO_3$), metaloxy salts, halocarbons, halogens. CO_2, metal carbonates, Al, AgF, O_2 nitryl fluoride, HNO_3, $KClO_3$, KNO_3, $KMnO_4$, steam (>700C), trichloroethylene, trichlorotri-fluoroethane, oxygen, carbon black, carbon dioxide and nitrogen, sodium chlorate.
Water applied to hot titanium may evolve hydrogen, causing an explosion.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS

Metal fumes and titanium oxides

HAZARDOUS POLYMERIZATION: Will occur [ ] Will not occur [X]

CONDITIONS TO AVOID - HAZARDOUS POLYMERIZATION

None

SECTION 11. TOXICOLOGICAL INFORMATION
Titanium metal, powder and pieces (>75 microns)

ims-rat TDLo: 114 mg/kg/77W-I:ETA

CHRONIC TOXICOLOGICAL EFFECTS

CARCINOGENICITY/OTHER INFORMATION

Questionable carcinogen with experimental tumorigenic data. Experimental reproductive effects.

orl-rat TDLO: 158 mg/kg multi:Reproductive effects
Intramuscular-rat TDLO: 114 mg/kg/77W-I: Equivocal Tumorigenic Agent
Intramuscular-rat TD: 360 mg/kg/69W-I: Equivocal Tumorigenic Agent

CARCINOGENICITY: NTP? No IARC Monographs? No OSHA Regulated? No

SECTION 12. ECOLOGICAL INFORMATION
Titanium metal, powder and pieces (>75 microns)

Ecotoxicity: Not Established

SECTION 13. DISPOSAL CONSIDERATIONS
Titanium metal, powder and pieces (>75 microns)

WASTE DISPOSAL METHOD

Dispose of in accordance with local, state and federal regulations.

SECTION 14. TRANSPORT INFORMATION
Titanium metal, powder and pieces (>75 microns)

LAND TRANSPORT (US DOT)

DOT PROPER SHIPPING NAME Titanium Metal Powder Dry

UN/NA NUMBER: UN2546

ADDITIONAL TRANSPORT INFORMATION

SECTION 15. REGULATORY INFORMATION
Titanium metal, powder and pieces (>75 microns)

No data available.

SECTION 16. OTHER INFORMATION
Titanium metal, powder and pieces (>75 microns)

Control of Substances Hazardous to Health Regulations
EH40 Occupational Exposure Limits

Maximum Exposure Limit: NE
Occupational Exposure Standard: NE
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