

**MATERIAL SAFETY DATA SHEET**

"Essentially Similar" to U.S. Department of Labor Form OSHA 20 (to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200)

Date: 01/01/2012 MSDS No. 770

**SECTION 1: IDENTIFICATION**

Manufacturer/Supplier	Stanford Advanced Materials 23661 Birtcher Dr., Lake Forest, CA 92630 U.S.A.
Telephone Number	(949) 407-8904
Fax Number	(949) 812-6690
Product Trade Name/Product Classification(s):	TITANIUM BASE ALLOYS ERTi-1-CP; ERTi-5; ERTi-5 ELI; ERTi-1 2; ERZr-2
Fire Hazard - 0 Health Hazard - 0 Reactivity - 0	

**SECTION 2: HAZARDOUS MATERIALS**

CHEMICAL COMP.	CAS NO.	ACGIH TLV Mg/M**	% COMP. BY WGT.*
TITANIUM (Ti)	7440-32-6	10 (TOTAL DUST)	50-99
MOLYBDENUM (Mo)	7439-98-7	10	0-37
VANADIUM (V)	7440-62-2	10(TOTAL DUST)	0-37
NIOBIUM (Ni)	7440-03-1	N/A	0-22
CHROMIUM(Cr)	7440-47-3	0.5	0-18
ALUMINUM (Al)	7429-90-5	10	0-15
TUNGSTEN (W)	7440-33-7	5	0-13
ZIRCONIUM (Zr)	7440-67-7	5	0-12
COPPER (Cu)	7440-50-8	1	0-10
TANTALUM (Ta)	7440-25-7	5	0-10
TIN (Sn)	7440-31-5	2	0-8
IRON (Fe)	7439-89-6	5 (IRON OXIDE)	0-5
MANGANESE (Mn)	7439-96-5	5	0-5
SILICONE (Si)	7440-21-3	10 (TOTAL DUST)	0-3

\*%COMPOSITION VARIED WITH TYPE OF MATERIAL

\*\*1985-86 ACGIH TRHRESHOLD LIMIT VALUE

**SECTION 3: PHYSICAL DATA**

Appearance and Odor: Silver Gray Metal and Odorless.  
 Boiling Point at 750 MM HG: Above 2000 C  
 Vapor Pressure: 0 at 20 C  
 Vapor Density (AIR = 1): NA  
 Solubility (Weight % in water): Insoluble  
 Specific Gravity (H O = 1): 4.4-6.6  
 Melting Point: Above 1500 C  
 % Volatile by volume: Non-volatile  
 Evaporation Rate: NA

NA=NOT APPLICABLE

**SECTION 4: FIRE AND EXPLOSION HAZARD DATA**

This product as a solid material will not ignite. High surface area material such as 5 micron powder may autoignite at room temperature.

Extinguishing Media: Dry salt or Type D (powder) fire extinguisher.

Fire fighting procedures: Isolate burning material. It is advisable to allow fire to burn out, keeping the fire from spreading. Wear reflective heat resistance suit. Small fires can be controlled by smothering with dry salt or using Type D (powder) fire extinguishers.

Unusual fire and explosion hazards: do not use water on burning fires, chips, or powder as a violent explosion may result. The hazard increases with finer particles. Carbon dioxide and nitrogen are ineffective in extinguishing burning titanium alloys.

## **SECTION 5: REACTIVITY DATA**

Stability: Stable

Conditions to avoid: Open flames and excessive heat.

Incompatibility: Avoid strong oxidizing and reducing agents. Titanium based alloys are rapidly dissolved by hydrofluoric acid and nitric-hydrofluoric acid mixtures. Titanium alloy will ignite in cold fluorine and above 200 C will react exothermically with chlorine, bromine, and halo carbons such as carbon tetrachloride, carbon tetrafluoride and freons.

Hazardous decomposition products: These alloys will not decompose. However, the above reactions with incompatible materials will generate reaction products such as flammable hydrogen, toxic fumes of nitrogen oxide, or corrosive metal halide vapors.

## **SECTION 6: HEALTH HAZARD DATA**

Primary routes of entry: Skin contact and inhalation.

Effects of exposure: No toxic effects would be expected from the solid titanium product under normal usage.

Prolonged and repeated exposure to fumes generated during welding, burning, or grinding may affect health in the following ways. It can cause respiratory irritation, chest pain, cough, and lung changes due to the effects of one or more of the elements present consistent with adverse health effects associated when overexposure occurs.

Chromium and nickel and their compounds are listed in the 3<sup>rd</sup> annual report on carcinogens, prepared by the National Toxicology Program. Exposure to high concentrations of fumes or dusts can cause sensitization dermatitis, inflammation or ulceration of upper respiratory tract, and possible lung or nasal cancer. Nickel, chromium and its compounds are listed in the current annual report on carcinogens, prepared by the national toxicology program. However, their presence in these alloys does not present a carcinogenic health hazard due to the low concentrations at which they are present and in their chemical form.

Skin contact: If irritation develops, remove contaminated clothing, wash skin with soap and water. If irritation persists, seek medical attention.

Eye contact: In case of irritation, flush with water for 15 minutes.

Inhalation: If exposed to excessive levels of metal fumes, immediately remove individual from contaminated area to fresh air. Seek medical attention immediately.

## **SECTION 7: SPILL OR LEAK PROCEDURES**

Spill or leak procedures: No special procedure.

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

## **SECTION 8: SPECIAL PROTECTION**

Solid form: Special protective clothing not normally needed.

Fumes and dust: Provide local exhaust ventilation in areas where metal fumes or dusts are produced. Wear NIOSH approved respirator if dust or fume exposure levels are exceeded.

## **SECTION 9: SPECIAL PRECAUTIONS**

Handling and storage: Machining of titanium alloys may result in fine turnings, chips or dust. Any material with a dimension less than .001 inches is flammable and should be kept away from any source of ignition.

## **SECTION 10: DISCLAIMER**

Stanford Advanced Materials strongly recommends the users of this product study this MSDS, the product label information and become aware of all hazards associated with welding. Stanford Advanced Materials believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Stanford Advanced Materials cannot make any expressed or implied warranty as to this information