Plasmaterials, Inc.
2268 Research Drive
Livermore, CA 94550
Ph: (925) 447-4030 Fx: (925) 447-4031
http://plasmaterials.com

MATERIAL SAFETY DATA SHEET

Section 1- PRODUCT IDENTIFICATION

COMPOSITION	PRODUCT NAME
Zr	**Zirconium**

Section 2- HAZARDOUS INGREDIENTS

Note: Products under normal conditions do not represent an inhalation, ingestion or contact health hazard.

MATERIAL OR COMPONENT	CAS NUMBER	WT%	EXPOSURE LIMITS	
			OSHA PEL (Mg/M3)	ACGIH TLV(MG/M3)
Zirconium	**7440-67-7**	**100%**	**5mg/m³**	**5mg/m³**

Section 3- PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS)	APPERANCE AND ODOR
□ **Liquid** □ **Solid** □ **Gas** □ **Other**	**Grayish-white lustrous metal**
MELTING POINT (BASE METAL)	SPECIFIC GRAVITY
1852°C	**6.506gm/cc at 20**

Section 4- FIRE AND EXPLOSION

Flash Point (Method Used)	Flammable Limits	LEL	UEL
N/A	**Flammable**	**N/D**	**N/D**

EXTINGUISHING MEDIA
DO NOT USE WATER ON METAL FIRES. Use dry chemical, CO2, sand and graphite.

SPECIAL FIRED FIGHTING PROCEDURES
Wear a self-contained breathing apparatus & full protective clothing to prevent contact with skin & eyes.

UNUSUAL FIRE AND EXPLOSION HAZARDS
See Attached

Section 5- REACTIVITY DATA

STABILITY	INCOMPATABILITY (MATERIALS TO AVOID)
Unstable (moisture, friction & oxidants are contributors to instability)	**CO2, N2, CC14, nitryl fluoride, oxygen containing compounds, P and water**

CONDITIONS TO AVOID
See Attached

HAZARDOUS DECOMPOISTION PRODUCTS
Zirconium Oxide

Section 6- HEALTH HAZARD GUIDE

MAJOR EXPOSURE HAZARD

□Inhalation □Skin □Skin Absorption □Eye Contact □Ingestion

EFFECTS OF OVEREXPOSURE

INHALATION: Respiratory irritant. Sneezing, coughing, difficulty breathing, headache & bronchitis.
SKIN CONTACT: Irritating, redness, inflammation possible.
EYE CONTACT: Irritating, redness, watering & inflammation possible.
OTHER: Zirconium and its salts generally have low systemic toxicity. Zirconium is not an important industrial poison. Most zirconium compounds in common uses are insoluble and are considered inert. Pulmonary granuloma in zirconium workers has been reported.

EMERGENCY & FIRST AID PROCEDURES

INHALATION: Remove to fresh air; give oxygen if breathing is difficult. Seek medical attention.
SKIN CONTACT: Brush of skin and wash area with soap and water. Seek medical attention.
EYE CONTACT: Flush eyes with lukewarm water for 15 minutes. Seek medical attention.
INGESTION: Give 1-2 cups of milk or water and induce vomiting. Seek medical attention.

Section 7- SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCUDRES
See Attached

WASTE DISPOSAL METHODS
Observe all federal, state and local regulations when storing or disposing of this substance.

Section 8- SPECIAL PROTECTION

RESPIRATORY
Wear NIOSH- approved dust-mist-fume cartridge respirator.

VENTILATION
Provide local exhaust ventilation. Maintain exposure below TLV. Mechanical ventilation not recommended. Handle in dry, inert atmosphere.

EYE PROTECTION & PROTECTIVE CLOTHING
Wear neoprene protective gloves. Wear safety glasses and wear protective clothing to prevent contamination of skin and clothes.

Section 9- SPECIAL PRECAUTIONS

Store in tightly closed containers in a cool, dry place. Wash hands and face thoroughly after handling and before meals.

Zirconium Continued

Unusual Fire and Explosion Hazards:

Material may emit toxic fumes if involved in fire. Dangerous fire hazard, in the form of dust, when exposed to heat or flame or by chemical reaction with oxidizers. Dangerous explosion hazard in the form of dust by chemical reaction with alkali hydroxides, air, alkali metal chromates, dichromate, molybdates, salts, sulfides, tunstates, borax, C14, CuO, Pb, P, KcLO3, KNO3, nitryl fluoride. Explosive range = 0.16 g/l in air. Powder damp with 5-10% of water may ignite and although 25% of water is regarded as a safe concentration, ignition of a 50% paste on breakage of a glass container has been observed. Although water is used to prevent ignition, the powder, once ignited, will burn under water (88.8% oxygen) more violently than in air (21% oxygen). The affinity of zirconium for oxygen is great, particularly when the metal is finely divided.

Conditions to Avoid:

1. Exclusion of air or oxygen by use of inert gases.
2. Exclusion of water, its vapor and other contaminants or oxidants.
3. Control of particle size.
4. Limitation of amount of powder handled or exposed.
5. Limitation of exposure of personnel.

AVOID: water, heat, sparks, flame, friction or oxidizers.

Spill or Leak Procedures:

Wear a self-contained breathing apparatus and full protective clothing. Isolate the area where the spill occurred. Insure proper ventilation and water/moisture are kept out of area. Vacuum up the spill using a high efficiency unit then place in a container for proper disposal. Take care not to raise dust.