

MATERIAL SAFETY DATA SHEET**I PRODUCT IDENTIFICATION**

Trade Name: Molybdenum Alloy 'TZM'

II HAZARDOUS INGREDIENTS

Hazardous Components	%	OSHA/PEL	ACGIH/ TLV
Molybdenum	0-100	15 mg/m ³	10 mg/m ³
Titanium	0.5	N/E	N/E
Zirconium	0.1	5 mg/m ³	5 mg/m ³

NFPA Ratings: Health: 0 Fire: 0 Reactivity: 0

III PHYSICAL DATA

Boiling Point:	4612 °C	Melting Point:	2617 °C
Specific Gravity (H₂O=1):	10.18 g/cc	Vapor Pressure (mm Hg):	N/A
Vapor Density:	N/A	% Volatile by Volume:	0
Appearance and Odor:	Gray metal, no odor.	Solubility in H₂O:	Insoluble

IV FIRE AND EXPLOSION HAZARDS DATA

Flash Point (Method used): N/A

Autoignition Temp: N/A

Flammable Limits: Lower: N/A Upper: N/A

Extinguishing Media: CO₂, extinguishing powder or water spray. Fight larger fires with water spray.

Special Fire Fighting Procedures: Use normal firefighting procedures which include wearing NIOSH/MSHA approved self-contained breathing apparatus, flame and chemical resistant clothing; hats, boots and gloves.

Unusual Fire and Explosion Hazards: Dust can combine with air to form an explosive mixture.

V HEALTH HAZARD INFORMATION

Effects of Exposure: Molybdenum dust and fumes (formed above 400 °C) can cause irritation of the eyes, nose, throat, and respiratory tract. Aside from isolated reports in the Russian literature suggesting an association between molybdenum exposure and pulmonary and joint disorders (gout-like condition), there are no recognized long term effects attributed to industrial exposure to molybdenum. In general, molybdenum and its compounds are considered to be of low toxicity.

Acute Effects:**Skin:** No irritant effect.**Eye:** No irritating effect.**Sensitization:** No sensitizing effects known.**Additional Toxicological Information:** When used and handled according to specifications, the product does not have any harmful

effects according to our experience and the information provided to us.

Routes of Exposure: Dust, mist and/or fumes generated during physical or metallurgical treatment may be inhaled, swallowed or come in contact with the skin or eyes.

Carcinogenic Assessment: None of the components of this material have been identified as known or suspected carcinogens by NTP, IARC, or OSHA.

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: If irritation occurs, remove from exposure. Seek medical attention.

INGESTION: If substantial quantities are swallowed, give person (if conscious) a large quantity of water to drink, induce vomiting. Seek medical attention.

SKIN: If irritation occurs, thoroughly wash affected area with mild soap and water and prevent further contact. If irritation persists, seek medical attention.

EYE: If irritation occurs, flush with copious amounts of water. If irritation persists seek medical attention.

VI REACTIVITY DATA

Stability: Stable

Conditions to Avoid: N/A

Incompatibility (Material to Avoid): Contact with acids releases flammable gases.

Hazardous Decomposition Products: No dangerous decomposition products known.

Hazardous Polymerization: Will not occur

VII SPILL OR LEAK PROCEDURES

Steps to Be Taken in Case Material Is Released or Spilled (Applicable for Grinding Dust): Ventilate area of spill. Clean-up using methods which avoid dust generation such as vacuuming (with appropriate filter to prevent airborne dust levels which exceed the PEL or TLV), wet dust mop or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Waste Disposal Method: Dispose of in accordance with Federal, State and Local regulations.

VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): Use an appropriate NIOSH approved respirator if airborne dust concentrations exceed the TLV. All appropriate requirements set forth in 29 CF 1910.134 should be met.

Ventilation: Use local exhaust ventilation which is adequate to limit personal exposure to levels which do not exceed the PEL or TLV. If such equipment is not available, use respirators as specified above.

Protective Gloves: Not required

Eye Protection: Not required

Other Protection: The usual precautionary measures for handling chemicals should be followed.

IX SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Avoid formation of dusts. Dust can combine with air to form an explosive mixture. No special storage requirements.

Work Practices: Maintain good housekeeping procedures to prevent accumulation of dust. Use clean-up methods which minimize dust generation such as vacuuming or wet clean-up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

Wash thoroughly after handling and before eating or smoking and at the end of the work shift. Do not shake clothing or other items to remove dust. Use a vacuum. Avoid dust inhalation and direct skin contact. Do not ingest.

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI shall not be held liable for any damages resulting from handling or from contact with the above product.

Issued by: S. Dierks
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