

Tam Ceramics Inc.
 4511 Hyde Park Blvd.
 P.O. Box 0067
 Niagara Falls, NY 14305-0067 U.S.A.

Product: ZIRCONIUM SPINEL
Internal ID: 51426

MSDS No: TAM CER / 51426
Date: November, 1991

National Paint
 and Coatings
 Association

 Hazardous Material
 Identification
 System

HEALTH HAZARD	1 - Slight
FLAMMABILITY HAZARD	0 - Minimal
REACTIVITY HAZARD	0 - Minimal
PERSONAL PROTECTION	TO BE SUPPLIED BY USER DEPENDING ON USE CONDITIONS.

SECTION I. MATERIAL IDENTIFICATION

Trade/Material Name: ZIRCONIUM SPINEL

Description: Double Silicate

Manufacturer: Tam Ceramics, Inc

Phone: (716) 278-9400

SECTION II. INGREDIENTS AND HAZARDS

Ingredient Name:	CAS Number:	Percent:	Exposure Limits:
Zircon (zirconium silicate)	14940-68-2	75	PEL (OSHA), TLV (ACGIH) For zirconium compounds (as Zr), the OSHA 8-hr TWA and ACGIH TLV-TWA is 5 mg/m ³
Zinc Oxide	1314-13-2	20	OSHA Final limit: TWA = 10 mg/m ³ ACGIH TLV-TWA: 10 mg/m ³ for total dust
Titanium and ferrous minerals silicon dioxide, amorphous	10193-36-9	<0.5 5	ACGIH TLV-TWA: 10 mg/m ³ for total dust.
silicon dioxide, crystalline	14808-60-7	<0.5	OSHA Final limit: 0.05 mg/m ³

Exposure limits for this product have not been established by OSHA or ACGIH. For particulates (not otherwise regulated), the OSHA 8 hour TWA is 5 mg/m³ (respirable dust), and 15 mg/m³ (total dust).



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MATERIAL SAFETY DATA SHEET

5/10/93

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SECTION III. PHYSICAL DATA

Appearance & Odor: Free-flowing sand, white and black granules, odorless

Boiling point: Not applicable	Evaporation rate: Not volatile
Vapor pressure: Not volatile	Specific gravity (H ₂ O=1): 4.5
Water solubility (%): Insoluble	Melting point: 1590 to 1830°C
Vapor density (air=1): Not volatile	% volatile by volume: Not volatile
pH: Not applicable	Molecular weight: _____

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point (method): Will not burn Limits: LEL %: N/A UEL %: N/A

NFPA Flammable/Combustible Liquid Classification: N/A

NFPA Fire Hazard Symbol Codes: Flammability: 0 Health: 0 Reactivity: 0 Special:

Extinguishing Media: Use the extinguishing media that is appropriate for the combustible or flammable materials in the area of use. Autoignition Temp: N/A

Unusual fire or explosion hazards: none

Special fire-fighting procedures: as appropriate for combustibles in the area of use.

SECTION V. REACTIVITY DATA

Material is stable Hazardous polymerization will not occur

Chemical incompatibilities: none known

Conditions to avoid: avoid creation of respirable dust

Hazardous decomposition Products: none known

SECTION VI. HEALTH HAZARD INFORMATION

This product is not considered a carcinogen by IARC, group 2A. However, crystalline silica is considered a probable carcinogen by IARC (group 2A)

Summary of risks: see below

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HEALTH HAZARD INFORMATION continued from page 2

First aid:

Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin contact: This material is not hazardous by skin contact, however thorough cleansing of the skin after use is advisable.

Inhalation: Remove to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: This compound is not hazardous by ingestion. However, if symptoms occur, call a physician.

This product as shipped may contain particles in the respirable size range. If broken down to respirable size during use, the particles may be harmful to the respiratory system when inhaled. This product contains trace quantities (100 to 120 pCi/g) of naturally occurring uranium and thorium. Overexposure by inhalation of respirable dusts containing uranium and thorium may cause lung cancer. This product contains low levels of quartz, up to 0.5%. Dust released during normal handling can cause eye and respiratory irritation. Prolonged breathing of excessive concentrations of dust from this product may cause lung damage. This product contains crystalline silica which has been classified as a probable cause of cancer. IARC has classified crystalline silica as probably carcinogenic for humans (2A)

SECTION VII. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill / Leak procedures: Sweep up spillage.

Waste management / Disposal: Comply with Federal, State, and local regulations. If approved, may be transferred to a land disposal site.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Personal protective equipment:

Goggles: Safety glasses with side shields

Gloves: recommended

Respirator: NIOSH/MSHA approved air supplied abrasive blasting respirators should be worn by abrasive-blasting operators. NIOSH/MSHA approved filter respirators equipped with high-efficiency filters should be worn for occasional, intermittent, or routine exposures involving generation of respirable dust of this product.



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SPECIAL PROTECTION INFORMATION continued from page 3

Workplace considerations:

Ventilation: Airborne dust levels should be controlled by physical enclosure of operations that may generate respirable dust of this product. The enclosure should be exhaust ventilated in accordance with 29 CFR 1910.94.

SECTION IX. SPECIAL PRECAUTIONS

SARA TITLE III HAZARD CATEGORIES:

Extremely hazardous substance - No
CERCLA Hazardous substance - No
Toxic chemical - No

CANADIAN WHMIS CLASSIFICATION:

D-2A

CALIFORNIA PROP 65 WARNING:

This product contains substances (crystalline quartz and radionuclides) known to the State of California to cause cancer.
Other ingredients are not listed as carcinogens by IARC, NTP, OSHA, or ACGIH.

DOT Class: not regulated by DOT UN Register: _____
Data source code(s): Dupont MSDS H-06068-2 07/90

Prepared/revised by: R.H. Steiger
Environmental/Safety Engineer
November, 1991

The information provided in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. Component percentages are typical analyses based on historical production performance. Tam Ceramics does not make any expressed or implied warranty that future production will continue to possess these typical properties