



SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

GHS Product Identifier: Zirox[®], Zirox[®] CS, Tamfire

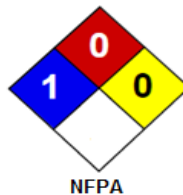
Chemical Name: Mixture (Zirconia, Calcia Stabilized Zirconia)

Recommended Applications: Used singularly or as a component in refractories, investment casting and high temperature coatings.

Manufacturer Information: TAM Ceramics, LLC (#220821)
 4511 Hyde Park Blvd Niagara Falls, NY 14305
 Phone Number: 716-278-9400

Website: www.tamceramics.com

CHEMICAL EMERGENCY CHEMTREC 24 HOUR EMERGENCY TELEPHONE
 Spill, Leak, Fire, Exposure DOMESTIC NORTH AMERICA 800-424-9300
 or Accident INTERNATIONAL CALL: 703-527-3887
 Collect Calls Accepted



Health	1
Fire	0
Reactivity	0
Personal Protection	X

HMIS

SECTION 2. HAZARD(S) IDENTIFICATION

GHS Pictogram:



Signal word:

WARNING

GHS classification:

Eye irritation, Category 2
 Skin irritation, Category 2

Hazard Statement:

Inert particles can be slightly, mechanically irritating to the eyes.
 Prolonged skin contact may cause skin irritation or dermatitis.
 Overexposure by inhalation may cause respiratory irritation.

Precautionary Statement:

Wash hands thoroughly after handling. Minimize exposure by wearing protective gloves, clothing, eye protection and respiratory masks. Have a clean change of works clothes readily available. Avoid dust formation and utilize good housekeeping practices.

Route of Exposure:

Eyes, skin, inhalation and ingestion.

Potential Health Effects:

Eye: May cause a slight irritation.
 Skin: May cause a slight irritation.
 Inhalation: Prolonged inhalation may cause respiratory tract irritations.
 Ingestion: May irritate digestive tract if swallowed.

Chronic toxicity:

Excessive inhalation of dust may cause chemical pneumonitis, cyanosis, and pulmonary edema. This product contains amorphous silica. Overexposure by inhalation of respirable dust may cause respiratory problems including pneumoconiosis. This product contains trace quantities (130 to 145 pCi/g) of naturally occurring Uranium and Thorium. Overexposure by inhalation of respirable dust containing these radioactive elements may cause lung cancer. This product contains zirconium dioxide and it has been reported to cause lung granulomas.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	EC Number	Weight %	OSHA	ACGIH
Zirconium Dioxide	1314-23-4	215-227-2	90 - 95%	5 mg/m ³ TW A as Zr	10 mg/m ³ STEL as Zr 5 mg/m ³ TW A as
Silica, amorphous, fumed	69012-64-2	273-761-1	0 - 1%	6 mg/m ³ TW A	Not established
Ferrous Oxide	1345-25-1	215-721-8	0 - 1%	Not established	1 mg/m ³ TW A (as Fe)
Calcium Oxide	1305-78-8	215-138-9	0 - 5%	5 mg/m ³ TW A	2 mg/m ³ TW A
Aluminum Oxide	1344-28-1	215-691-6	0 - 1%	15 mg/m ³ TWA (total dust) 5 mg/m ³ TW A (respirable fraction)	10 mg/m ³ TW A
Hafnium Oxide	12055-23-1	235-013-2	1 - 3%	0.5 mg/m ³ TW A	0.5 mg/m ³ TW A
Titanium Dioxide	13463-67-7	236-675-5	0 - 1%	Not established	Not established

OSHA particulate (not otherwise regulated) limit: 5 mg/m³ (respirable); 15 mg/m³ (total).

This material contains very low levels of Naturally Occurring Radioactive Material (NORM).

SECTION 4. FIRST AID MEASURES

Eye contact: Rinse immediately with plenty of water, also under the eyelids. Get medical attention if irritation develops.

Skin contact: Wash off immediately with soap and plenty of water. Remove and wash contaminated clothing before re-use. If symptoms persist, call a physician.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. If symptoms persist, call a physician.

Ingestion: Drink plenty of water. Consult a physician if necessary. Do not induce vomiting without medical advice.

Notes to physician: Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Flash point: Non combustible

Suitable extinguishing media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Hazardous decomposition products: Thermal decomposition can lead to release of irritating gases and vapors.

Special protective equipment for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH (approved or equivalent) and full protective gear.

Unusual hazards: Dust may form explosive mixture in air.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Avoid dust formation. Evacuate area of all unnecessary personnel. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Fine dust dispersed in air may ignite.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Do not flush into surface water or sanitary sewer system.

Methods for cleaning up: Use approved industrial vacuum cleaner for removal. Wear personal protective equipment. Dispose of promptly.

SECTION 7. HANDLING AND STORAGE

Handling: Handle in accordance with good industrial hygiene and safety practice. Avoid dust formation. Avoid contact with skin, eyes and clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Provide appropriate exhaust ventilation at places where dust is formed. Remove all sources of ignition. Wash hands thoroughly before eating, drinking or smoking.

Storage: Keep container tightly closed in a dry and well-ventilated place.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Ensure adequate ventilation, especially in confined areas. Airborne dust levels should be controlled by physical enclosure during abrasive blasting operation.

Respiratory protection: Use NIOSH approved respirator when ventilation is inadequate. Wear NIOSH approved respirator to limit exposure to NORM. Use an H EPA-filtered approved for radionuclides where airborne concentrations are expected to exceed exposure limits. Use a supplied-air respirator if there is any potential for an uncontrolled release, exposure levels are not known, or where air purifying respirators may not provide adequate protection. OSHA requires a continuous flow air-line supplied respirator with hood for protection in abrasive blasting operations. Refer to OSHA Standards 29 CFR 1910.94

Hand protection: Impervious gloves.

Skin and body protection: Lightweight protective clothing. Chemical-resistant gloves and impermeable body covering to minimize skin contact. Contaminated work clothing should not be allowed out of the workplace. Keep working clothes separately. Remove and wash contaminated clothing before re-use.

Eye protection: Safety glasses with side-shields.

Exposure limits: See Section 3.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Color: White to Light Yellow

Odor: Odorless

Boiling point/range (°C): No data available

Melting point/range (°C): 2715

Vapor pressure (mmHg): No data available

Water solubility (mg/l): Insoluble

Physical state: Powder

Molecular weight: No data available

pH: No data available

Specific gravity (Water =1): 5.600 - 5.900

Evaporation rate (Water =1): No data available

VOC content (%): No data available

Odor threshold: No data available

Vapor pressure: No data available

Flash point: No data available

Flammability (solid, gas): No data available

Upper/lower flammability or explosive limits: No data available

Vapor density: No data available

Relative density: No data available

Partition coefficient: n-octanol/water: No data available

Auto-ignition temperature: No data available

Decomposition temperature: No data available

Viscosity: No data available

SECTION 10. STABILITY AND REACTIVITY

Stability: Stable at normal conditions.

Polymerization: Will not occur.

Hazardous decomposition products: None under normal use.

Materials to avoid: None known.

Conditions to avoid: Avoid dust formation.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity: No data is available on the product itself

Carcinogenic effects: Not listed by IARC, NTP or OSHA as a carcinogen.

Target Organ Effects: Amorphous silica: Respiratory system, eyes. Zirconium: Skin, respiratory system.

SECTION 12. ECOLOGICAL INFORMATION

Aquatic toxicity: No information available.

Persistence and degradability: Not determined

SECTION 13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: Waste must be disposed of in accordance with federal, state and local environmental control regulations. Where possible recycling is preferred to disposal or incineration. This product contains Naturally Occurring Radioactive Materials (NORM). Consult and comply with current regulations.

SECTION 14. TRANSPORT INFORMATION

DOT Classification (U.S.): Not a DOT controlled material (United States).

Proper shipping name: Not regulated

TDG (Canada)

Proper shipping name: Not regulated.

SECTION 15. REGULATORY INFORMATION

U.S. Regulations:

Not subject to the provisions of SARA 313 Title III

Not subject to TSCA 12(b) Export Notification

State Regulations

This product or its ingredients have been evaluated for New Jersey, Pennsylvania, and California Prop 65 supplier notification requirements. Substances that are subject to notification requirements, if any, are listed below.

Zirconium dioxide

NJRTK: sn 2047

California Prop 65: Radionuclides Silica, amorphous, fumed

NJRTK: sn 1655 **PARTK:** Listed (NJRTK) Listed (NJRTK)

Calcium Oxide NJRTK: sn 0325

PARTK: Listed (NJRTK)

Aluminum oxide

NJRTK: sn 2891

PARTK: Listed (NJRTK)

Canadian WHMIS

WHMIS hazard class: D2A Very toxic materials. D2B Toxic materials.

Canadian Ingredient Disclosure List (IDL): Not Listed.

DSCL (EEC):

This product is not classified according to the EU regulations. S24/25- Avoid contact with skin and eyes. S28- After contact with skin, wash immediately with plenty of water.

S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.

International Inventories TSCA 8(b): Listed or exempt. Canadian DSL: Listed or exempt. EINECS: Listed or exempt. Philippines (PICCS): Not Listed. Japan (ENCS): Listed or exempt.

Korea (KECL): Listed. China (IECS): Listed. Australia (AICS): Listed.

SECTION 16. OTHER INFORMATION

For Industrial Use Only

National Fire Protection Association (U.S.A.):

Health: 1

Fire: 0

Physical Hazard: 0

PPE: X

Prepared by: Product Manufacturer, TAM Ceramics Group of NY, LLC

Protective Equipment: Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.

The information and recommendations contained in this Safety Data Sheet have been compiled from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the SDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either alone or in combination with other products, and determine its environmental regulatory compliance obligations under any applicable federal or state laws.

Last Updated: May 2015

End of Safety Data Sheet