



**FERRO**<sup>®</sup>  
**ELECTRONIC MATERIALS**

## **MATERIAL SAFETY DATA SHEET**

### **G Zircon Milled Coarse**

Ferro Product ID 51476

Revision No. 7

October, 1999

#### **CHEMICAL PRODUCT/COMPANY IDENTIFICATION**

##### **Material Identification**

Ferro Electronic Materials Product Identification Number: 51476

##### **Tradenames and Synonyms**

ZIRCONIUM SILICATE

ZIRCON

CERAMIC OPACIFIER

##### **Company Identification**

MANUFACTURER

**FERRO ELECTRONIC MATERIALS**

4511 Hyde Park Blvd.

Niagara Falls, NY 14305-0067

DISTRIBUTOR

**FERRO ELECTRONIC MATERIALS**

4511 Hyde Park Blvd.

Niagara Falls, NY 14305-0067

PHONE NUMBERS

Product Information 1-716-278-9400

Transport Emergency **CHEMTREC:**

**1-800-424-9300**

Safety/Health Information 1-716-278-9423

#### **COMPOSITION/INFORMATION ON INGREDIENTS**

## Components

<b>Material</b>	<b>CAS Number</b>	<b>%</b>
ZIRCON	14940-68-2	95
KYANITE	1302-76-7	0.3
ALUMINUM SILICATES	1335-30-42	3
QUARTZ	14808-60-7	<0.5

## HAZARDS IDENTIFICATION

### Potential Health Effects

The product, as shipped, does not pose an inhalation health hazard because it contains essentially no particles in the respirable size range. However, if during handling or use the particles are broken down to a size that can be inhaled, the dusts may be harmful to the respiratory system. This product contains trace quantities (90-110 pCi/g) of naturally occurring radioactive uranium and thorium (less than or equal to 420 ppm total uranium and thorium or 0.042% w/w), and (109-114 pCi/g) radium. Overexposure by inhalation to respirable dusts containing radioactive uranium, thorium, and radium may cause lung cancer. Eye contact with the product may cause irritation with discomfort, tearing, or blurring of vision.

The predominant effect of overexposure to airborne respirable quartz in humans is silicosis. Silicosis is a chronic fibrotic lung disease characterized by formation of silica containing scar tissue in the lungs with symptoms of coughing, dyspnea, wheezing, and nonspecific respiratory ailments. Gross acute overexposures to quartz by inhalation may cause fatality. Epidemiological studies show that, in addition to silicosis, there is limited evidence of excess lung cancer in occupations involving exposures mainly to respirable quartz, such as stone cutters and granite industry workers.

Individuals with preexisting conditions of the lungs may have increased susceptibility to the toxicity of excessive exposures.

Observance of the 5 mg/m<sup>3</sup> OSHA PEL for respirable dust will ensure that use of this product is within limits established for exposure to respirable quartz and to naturally occurring radioactive uranium, thorium, and radium.

Zircon is exempt from NRC regulations for source material per 10 CFR 40, since it falls under the definition of unprocessed material containing less than 0.05% uranium or thorium. However, observance of 2.2 - 2.8 mg/m<sup>3</sup> of respirable dust will under voluntary guidelines ensure that intake is less than 10% of the Annual

Limits on Intake (ALIs) specified in 10 CFR 20.1502(b) and NRC Standards for Protection Against Radiation for uranium, thorium, radium, and radioactive daughter decay products.

### Target Organs

None reported.

### Primary Entry Route

This product can enter the body by ingestion or inhalation.

### Carcinogenicity Information

The following components are listed by IARC, NTP, OSHA, or ACGIH as carcinogens. A "P" indicates a proposed carcinogen.

<u>Material</u>	<u>IARC</u>	<u>NTP</u>	<u>OSHA</u>	<u>ACGIH</u>
QUARTZ	X	X		

## FIRST AID MEASURES

### Inhalation

If inhaled, immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

### Skin Contact

The compound is not hazardous by skin contact, but removal of particles and cleansing of the skin after use is advisable.

## FIRE FIGHTING MEASURES

### Flammable Properties

Will not burn.

### Extinguishing Media

As appropriate for combustibles in area.

### Fire Fighting Instructions

None.

## ACCIDENTAL RELEASE MEASURES

### Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

### Accidental Release Measures

Sweep up spillage. Avoid creation of respirable airborne dust.

## HANDLING AND STORAGE

### Handling (Personnel)

Avoid breathing dust. Wash thoroughly after handling. If handling respirable flour, use of gloves and washing before eating, drinking, applying cosmetics, or smoking is advisable to minimize dust inhalation from hands.

### Storage

Store this product in closed containers. Protect containers from physical damage.

## EXPOSURE CONTROLS/PERSONAL PROTECTION

### Engineering Controls

Use sufficient ventilation to keep employee exposure below recommended limits. When using this product as an abrasive blast agent in confined areas, airborne dust levels should be controlled by physical enclosure of the abrasive blasting operation. The enclosure should be exhaust ventilated in accordance with 29 CFR 1910.94 Ventilation (a) Abrasive Blasting.

### Personal Protective Equipment

#### Eye/Face Protection

Wear safety glasses with side shields.

#### Respirators

A NIOSH/MSHA approved air-purifying respirator with a high efficiency filter approved for radionuclides may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances 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.

### Protective Clothing

Wear impervious clothing, such as gloves, apron, boots, or whole bodysuit as appropriate.

### Exposure Guidelines

Zirconium silicate products

PEL (OSHA) Particulates (Not Otherwise Regulated)

15 mg/m<sup>3</sup>, 8 Hr. TWA, total dust

5 mg/m<sup>3</sup>, 8 Hr. TWA, respirable dust

### Other Applicable Exposure Limits

#### ZIRCON

PEL (OSHA) 5 mg/m<sup>3</sup>, 8 Hr. TWA, as Zr

TLV (ACGIH) 5 mg/m<sup>3</sup>, 8 Hr. TWA, STEL 10 mg/m<sup>3</sup>, as Zr

Notice of Intended Changes (1995-1996) A4

#### QUARTZ

PEL (OSHA) Total dust, (30 mg/m<sup>3</sup> / % SiO<sub>2</sub> + 2)

Respirable dust, (10 mg/m<sup>3</sup> / % SiO<sub>2</sub> + 2) as 8 Hr. TWA's

TLV (ACGIH) 0.1 mg/m<sup>3</sup>, respirable dust, 8 Hr. TWA

Notice of Intended Changes (1995-1996) A2

Or see: Christobalite [14464-46-1],  
Silica, Fused [60676-86-0], Tridymite  
[15468-32-2], Tripoli [1317-95-9]

## PHYSICAL AND CHEMICAL PROPERTIES

### Physical Data

Vapor Pressure

Not volatile

Vapor Density

Not volatile

Melting Point

2,100 C (3,810 F) 2,100 to 2,300 C  
(3,810 to 4,170 F)

Evaporation Rate

(Butyl Acetate = 1)

Not volatile

Solubility in Water

Insoluble

Odor

Odorless

Form

Free-flowing finely milled sandy particles

Color

Off-white

Specific Gravity

4.7

### Stability and Reactivity

#### Chemical Stability

Stable.

### **Incompatibility with Other Materials**

None reasonably foreseeable.

### **Decomposition**

Decomposition will not occur.

### **Polymerization**

Polymerization will not occur.

## **TOXICOLOGICAL INFORMATION**

### **Animal Data**

Ferro zirconium silicate products are made from zircon sands which contain low levels of quartz (up to 0.5%). Effects noted in animals exposed to respirable quartz by inhalation or intratracheal instillation included pulmonary fibrosis, inflammation, edema, and emphysema. Lung tumors occurred in rats exposed by inhalation for up to two years to levels of 12.4 or 51.6 mg/m<sup>3</sup> of quartz. Also, lung tumors were seen in studies in which quartz was instilled in the trachea of rats. Quartz was positive in mammalian cell cultures for cell transformation and chromosomal effects and was negative in cell culture assays for gene mutation in bacteria and DNA damage in mammalian cells and in a whole animal assay for chromosomal effects.

## **DISPOSAL CONSIDERATIONS**

### **Waste Disposal**

Treatment, storage, transportation, and disposal must be in accordance with applicable federal, state, and local regulations. If approved, may be transferred to a land disposal site.

#### **NOTE:**

Many states have, or are developing, new regulations for disposal of waste containing Naturally Occurring Radioactive Materials (NORM) above background levels. Consult and comply with current regulations.

## **TRANSPORTATION INFORMATION**

### **Shipping Information**

ZIRCON SAND IS NOT REGULATED AS A HAZARDOUS MATERIAL BY DOT OR IMO.

## Shipping Containers

Hopper Cars  
Hopper Trucks  
Bags  
Semi-bulk Bags

## REGULATORY INFORMATION

EPA TSCA Status: All ingredients in this product are listed on the EPA Toxic Substances Control Act Chemical Substance Inventory

### U.S. Federal Regulations

TSCA Inventory Status: Reported/Included.

### TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : No  
Chronic : Yes  
Fire : No  
Reactivity : No  
Pressure : No

### LISTS:

SARA Extremely Hazardous Substance - No  
CERCLA Hazardous Material - No  
SARA Toxic Chemical - No

### CANADIAN WHMIS CLASSIFICATIONS:

D-2A; D-2B

“Zircon is exempt from NRC regulations for source material per 10 CFR 40, since it falls under the definition of unprocessed material containing less than 0.05% uranium or thorium.”

## OTHER INFORMATION

### NFPA, NPCA-HMIS

NPCA-HMIS Rating  
Health 0  
Flammability 0  
Reactivity 0

Personal protection rating to be supplied by user depending on use conditions.

### **Additional Information**

#### **WARNING!**

This product contains quartz and radionuclides, both known to the State of California to cause cancer.

**DO NOT INGEST. AVOID THE CREATION AND INHALATION OF RESPIRABLE AIRBORNE PARTICLES. SEE MATERIAL SAFETY DATA SHEET FOR ADDITIONAL INFORMATION.**

The data 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 based on historical production performance. Ferro Electronic Materials does not make any expressed or implied warranty that future production will continue to possess these typical properties.

#### **Responsibility for MSDS**

Ferro Electronic Materials  
4511 Hyde Park Blvd.  
Niagara Falls, NY 14305-0067

Russ Steiger  
Manager of Health, Safety, & Environmental  
Telephone (716) 278 -9423  
Fax (716) 285-3026

**End of MSDS**