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## MATERIAL SAFETY DATA SHEET

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product Name:** FB-268-D-2 Frit 50 Lb Bags **Date of Preparation:** 06/15/2012  
**Chemical Name:** Frit  
**Synonym:** Glassy mixture of particle size reduction after milling.  
**CAS-No.:** 65997-18-4  
**Formula:** TSCA Description: "Frit is a mixture of inorganic chemical substances produced by rapidly quenching a molten, complex combination of materials, confining the chemical substances thus manufactured as non-migratory components of glassy solid flakes or granules."  
**Product Code:** 1309630

### 2. HAZARDS IDENTIFICATION

#### Emergency Overview

##### Warning

Avoid dust formation. Do not breathe vapours/dust. May cause respiratory tract, eye and skin irritation.

		HMIS	NFPA 704
<b>Color:</b> White	<b>Health:</b>	2*	2
<b>Physical state:</b> Powder	<b>Flammability:</b>	0	0
<b>Odor:</b> None	<b>Physical Hazard:</b>	0	0
	<b>PPE:</b>	X	

#### Potential Health Effects

**Principle routes of exposure:** Inhalation, ingestion, skin and eye contact.

**Eye contact:** Contact with eyes may cause irritation.

**Skin contact:** Prolonged skin contact may cause skin irritation and/or dermatitis.

**Inhalation:** Dust or fumes from firing irritating to respiratory tract. Fumes may cause lung inflammation. Metal fumes containing fluoride may cause lung inflammation. Symptoms may include chest pains, chills, cough, headache, and diarrhea.

**Ingestion:** May irritate digestive tract.

**Chronic toxicity:** No known effects under normal conditions of use. Excessive inhalation of dust may cause chemical pneumonitis, cyanosis, and pulmonary edema. Chronic overexposure to fluoride may result in digestive disturbances, mottled tooth enamel, abnormal hardening of the bones and other bone changes, and damage to the liver and kidneys. Skin rashes and worker complaints related to bones, joints, and muscles have been reported. .

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Weight %
Frit*		100% (May contain - see below)
Fluoride	7782-41-4	1 - 5%

\* Frit, with CAS # [65997-18-4], is a mixture of inorganic chemical substances produced by rapidly quenching a molten, complex combination of materials, confining the chemical substances thus manufactured as non-migratory components of glassy solid flakes or granules. These components are present as part of the Frit.

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This product contains trace quantities of naturally occurring radioactive uranium, thorium and radium (<0.01% total). Overexposure by inhalation to respirable dusts containing uranium, thorium and radium may cause cancer, however, observance of the OSHA limit for respirable dusts of 5 mg/m<sup>3</sup> will ensure the use of this product to be well below the regulatory limits established for these components.

#### 4. FIRST AID MEASURES

<b>Eye contact:</b>	Rinse immediately with plenty of water, also under the eyelids. Get medical attention if irritation develops.
<b>Skin contact:</b>	Wash off immediately with soap and plenty of water. Remove and wash contaminated clothing before re-use. If symptoms persist, call a physician.
<b>Inhalation:</b>	Move to fresh air. If breathing is difficult, give oxygen. If symptoms persist, call a physician.
<b>Ingestion:</b>	Drink plenty of water. Do not induce vomiting. Consult a physician if necessary.
<b>Notes to physician:</b>	Treat symptomatically.

#### 5. FIRE-FIGHTING MEASURES

<b>Flash point (°C):</b>	Non combustible
<b>Suitable extinguishing media:</b>	The product itself does not burn. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
<b>Special protective equipment for firefighters:</b>	As in any fire, wear self-contained breathing apparatus (pressure-demand, NIOSH approved or equivalent) and full protective gear.

#### 6. ACCIDENTAL RELEASE MEASURES

<b>Personal precautions:</b>	Remove all non-essential people from the affected area. Avoid dust formation. Do not breathe vapors/dust. Ensure adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid contact with skin, eyes and clothing. Wear personal protective equipment.
<b>Environmental precautions:</b>	Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system.
<b>Methods for cleaning up:</b>	Wear personal protective equipment. Use approved industrial vacuum cleaner for removal. Clean contaminated surface thoroughly. Dispose of promptly.

#### 7. HANDLING AND STORAGE

<b>Handling:</b>	Avoid dust formation. Do not breathe vapours/dust. Handle in accordance with good industrial hygiene and safety practice. Use only in area provided with appropriate exhaust ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Do not eat, drink, or smoke in areas of use or storage. Do not take internally. Wash thoroughly after handling.
<b>Storage:</b>	Keep container tightly closed in a dry and well-ventilated place.

#### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

##### Exposure limits

Minimize exposure in accordance with good hygiene practice.

Components	OSHA	ACGIH
Frit	0.5 mg/m <sup>3</sup> TWA Sb 5 mg/m <sup>3</sup> TWA Zr 5 mg/m <sup>3</sup> Ceiling Mn	10 mg/m <sup>3</sup> STEL Zr 0.5 mg/m <sup>3</sup> TWA Sb 5 mg/m <sup>3</sup> TWA Zr 0.2 mg/m <sup>3</sup> TWA Mn

Components	OSHA	ACGIH
Fluoride	0.1 ppm TWA 0.2 mg/m <sup>3</sup> TWA	2 ppm STEL 1 ppm TWA

<b>Engineering measures:</b>	Provide appropriate exhaust ventilation at machinery and at places where dust or fumes can be generated. Ensure that eyewash stations and safety showers are proximal to the work-station location. Ensure adequate ventilation, especially in confined areas.
<b>Eye protection:</b>	Safety glasses with side-shields.
<b>Skin and body protection:</b>	Lightweight protective clothing. Keep working clothes separately. Remove and wash contaminated clothing before re-use.
<b>Hand protection:</b>	Impervious gloves. Follow the recommendations given by the manufacturer of protective gloves.
<b>Respiratory protection:</b>	In case of insufficient ventilation wear suitable respiratory equipment . Seek professional advice prior to respirator selection and use. NIOSH-approved respirators should be worn where engineering controls and work practices do not reduce exposure to or below the PEL.
<b>Hygiene measures:</b>	Wash hands before breaks and immediately after handling the product.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Color:</b>	White	<b>Physical state:</b>	Powder
<b>Odor:</b>	None	<b>Molecular weight:</b>	No data available
<b>Boiling point/range (°C):</b>	No data available	<b>pH:</b>	No data available
<b>Melting point/range (°C):</b>	1200	<b>Specific gravity (Water =1):</b>	3.0
<b>Vapor pressure :</b>	No data available	<b>Water solubility:</b>	No information available
<b>VOC content (%)</b>	No data available		

## 10. STABILITY AND REACTIVITY

<b>Stability:</b>	Stable at normal conditions.
<b>Polymerization</b>	Will not occur.
<b>Hazardous decomposition products:</b>	None under normal use.
<b>Materials to avoid:</b>	None known.
<b>Conditions to avoid</b>	None known.

## 11. TOXICOLOGICAL INFORMATION

**Acute toxicity:** Information given is based on data on the components and the toxicology of similar products

**Component information, if any, is listed below**

### Frit

<b>LD50s and LC50s:</b>	Oral LD50 (Rat) = 2000 mg/kg
<b>NTP:</b>	Known Human Carcinogen
<b>NTPS. Carcinogen:</b>	Reasonably Anticipated To Be A Human Carcinogen
<b>IARC - Group 1:</b>	Listed
<b>IARC - Group 2A:</b>	Listed
<b>IARC - Group 2B:</b>	Listed

### Fluoride

<b>LD50s and LC50s:</b>	Inhalation LC50 (Rat) = 185 ppm
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## 12. ECOLOGICAL INFORMATION

**Aquatic toxicity:** Information given is based on data on the components and the ecotoxicology of similar products.

**Persistence and degradability:** Not determined

## 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.

## 14. TRANSPORT INFORMATION

### DOT (U.S.)

**Proper shipping name:** Not regulated.

#### Fluoride

**CERCLA/DOT RQ:** 10 lb  
4.54 kg

### TDG (Canada)

**Proper shipping name:** Not regulated.

## 15. REGULATORY INFORMATION

### U.S. Regulations:

**TSCA:** Not subject to TSCA 12(b) Export Notification

### SARA 313:

Components	U.S. - CERCLA/SARA - Section 313 - Emission Reporting
Fluoride (1 - 5%)	1.0 % de minimis concentration

### 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.

Components	PARTK:
Fluoride	Listed (PARTK)

Components	NJRTK:
Zinc compounds	Listed (NJRTK)
Fluoride	Listed (NJRTK)

### Canadian WHMIS

**WHMIS hazard class:** Non-controlled

### Canadian Ingredient Disclosure List (IDL):

Components	Canada - WHMIS Ingredient Disclosure:
Fluoride	1

### International Inventories

**TSCA 8(b):** Listed or exempt.

Canadian DSL/NDSL list	All ingredient(s) are listed on the DSL or NDSL
EC-No.	Listed or exempt.
Philippines (PICCS):	Listed.
Japan (ENCS):	Listed or exempt.
Korea (KECL):	Listed.
China (IECS):	Listed.
Australia (AICS):	Listed.
New Zealand (NZIoC):	Listed.

## 16. OTHER INFORMATION

### For Industrial Use Only.

**Prepared by:** Ferro Technical Center

The information and recommendations contained in this Material 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 MSDS 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.

**End of Safety Data Sheet**



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