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## MATERIAL SAFETY DATA SHEET

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

**Product Name:** CC257-2 Glaze Frit BAG50LB **Date of Preparation:** 10/26/2011  
**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:** 1133980

### 2. HAZARDS IDENTIFICATION

#### Emergency Overview

##### Warning

May cause respiratory tract, eye and skin irritation. Do not breathe vapours/dust. Contains crystalline silica which causes silicosis and lung cancer.

		HMIS	NFPA 704
<b>Color:</b>	White	2*	2
<b>Physical state:</b>	Powder	0	0
<b>Odor:</b>	Odorless	0	0
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#### 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.

**Inhalation:** Dust or fumes from firing irritating to respiratory tract. Fumes may cause lung inflammation.

**Ingestion:** May irritate digestive tract.

**Chronic toxicity:** Excessive inhalation of fumes or dust may cause chemical pneumonitis, cyanosis, and pulmonary edema. Titanium Dioxide is listed by IARC as possibly carcinogenic to humans (Group 2B) based on inadequate evidence of carcinogenicity in humans and sufficient evidence in experimental animals. Respirable crystalline silica has been classified as a Group 1 (sufficient evidence in humans for carcinogenicity) carcinogenic by IARC and is listed by NTP as a substance which may reasonably be anticipated to be a carcinogen. Long term inhalation causes lung damage (silicosis and cancer).

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Weight %
Frit*		100% (May contain - see below)
Titanium Dioxide	13463-67-7	<0.5%
Quartz silica	14808-60-7	<0.5%

The specific chemical identities are being withheld as a trade secret (29CFR1910.1200).

\* 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.

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 thoroughly 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. Get medical attention if irritation develops.
<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>Hazardous decomposition products:</b>	Thermal decomposition can lead to release of irritating gases and vapors. Heavy metal compounds. BaO.
<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.
<b>Unusual hazards:</b>	None known.

#### 6. ACCIDENTAL RELEASE MEASURES

<b>Personal precautions:</b>	Avoid dust formation. Do not breathe vapors/dust. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Ensure adequate ventilation.
<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.
<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>	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. Do not eat, drink, or smoke in areas of use or storage.
<b>Storage:</b>	Keep in a dry, cool and well-ventilated place.

#### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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 1 mg/m <sup>3</sup> TWA Cu dust and mist 5 mg/m <sup>3</sup> TWA Zr 0.2 mg/m <sup>3</sup> TWA Mn
Titanium Dioxide	15 mg/m <sup>3</sup> TWA total dust	10 mg/m <sup>3</sup> TWA
Quartz silica	Listed	0.025 mg/m <sup>3</sup> TWA respirable fraction

<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.
<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.
<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 at the end of workday. Wash contaminated clothing before re-use.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Color:</b>	White	<b>Physical state:</b>	Powder
<b>Odor:</b>	Odorless	<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>	No data available	<b>Specific gravity (Water =1):</b>	No data available
<b>Vapor density:</b>	Non-volatile	<b>Vapor pressure :</b>	No data available
<b>Evaporation Rate (Water = 1)</b>	Non-volatile	<b>Water solubility:</b>	Insoluble
<b>VOC content (%)</b>	0		

## 10. STABILITY AND REACTIVITY

<b>Stability:</b>	Stable at normal conditions.
<b>Polymerization</b>	Will not occur.
<b>Hazardous decomposition products:</b>	No decomposition if stored normally. Thermal decomposition can lead to release of irritating gases and vapors.
<b>Materials to avoid:</b>	None known.
<b>Conditions to avoid</b>	None known.

## 11. TOXICOLOGICAL INFORMATION

<b>Acute toxicity:</b>	Information given is based on data on the components and the toxicology of similar products.
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<b>Chronic Toxicity:</b>	In lifetime inhalation studies of rats, airborne respirable size titanium dioxide particles have been shown to cause lung tumors at concentrations associated with substantial particle lung burdens and consequential pulmonary overload and inflammation. However, other laboratory animals such as mice and hamsters did not develop lung tumors under similar testing with titanium dioxide. Human epidemiology studies do not suggest an association between occupational exposure to titanium dioxide and risk for cancer. Contains crystalline silica which causes silicosis and lung cancer.
<b>Carcinogenic Effects:</b>	Respirable crystalline silica has been classified as a Group I (sufficient evidence in humans for carcinogenicity) carcinogenic by IARC and is listed by NTP as a substance which may reasonably be anticipated to be a carcinogen. Crystalline silica is also a known cause of silicosis, a non-cancerous lung disease caused by excessive exposure to crystalline silica.
<b>Target Organ Effects:</b>	Titanium dioxide: Respiratory system. Silica: Respiratory system. Barium compound: Heart, gastrointestinal tract.

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

**Frit**

<b>LD50s and LC50s:</b>	Oral LD50 (Rat) = 2000 mg/kg
<b>OSHA - Select Carcinogens:</b>	Present
<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

**Titanium Dioxide**

<b>LD50s and LC50s:</b>	Oral LD50 (Rat) = 10000 mg/kg
<b>OSHA - Select Carcinogens:</b>	Present

**Quartz silica**

<b>LD50s and LC50s:</b>	Oral LD50 (Rat) = 500 mg/kg
<b>OSHA - Select Carcinogens:</b>	Present
<b>NTP:</b>	Known Human Carcinogen
<b>IARC - Group 1:</b>	Listed

**12. ECOLOGICAL INFORMATION**

<b>Aquatic toxicity:</b>	No data is available on the product itself. Information given is based on data on the components and the ecotoxicology of similar products.
<b>Persistence and degradability:</b>	No information available.

**13. DISPOSAL CONSIDERATIONS**

<b>Waste from residues / unused products:</b>	Waste must be disposed of in accordance with federal, state and local environmental control regulations. Where possible recycling is preferred to disposal or incineration.
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**14. TRANSPORT INFORMATION**

**DOT (U.S.)**

<b>Proper shipping name:</b>	Not regulated.
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**TDG (Canada)**

<b>Proper shipping name:</b>	Not regulated.
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**15. REGULATORY INFORMATION**

**U.S. Regulations:**

**SARA 313:**

Components	U.S. - CERCLA/SARA - Section 313 - Emission Reporting
Barium compounds (30 - 40%)	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:
Barium compounds	Listed (PARTK)

Components	NJRTK:
Quartz silica	Listed (NJRTK)
Barium compounds	Listed (NJRTK)

Components	State Regulation - CA Prop65
Quartz silica	Carcinogen

**Canadian WHMIS**

WHMIS hazard class: D2A Very toxic materials D2B Toxic materials

**Canadian Ingredient Disclosure List (IDL):****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

Disclaimer: 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**