

MATERIAL SAFETY DATA SHEET

Issue Date: 07/09/98

TO THE PURCHASER: This MSDS contains important environmental, safety and health information for your employees. Federal regulations require that this information be made available to them. If you resell this product, a copy of this MSDS should be given to the buyer.

PRODUCT IDENTIFICATION: 3289/3289-2
(Common Name) Ferro frit 3289

CHEMICAL FAMILY: Frits TSCA Inventory CAS # 65997-18-4*

SYNONYM: Chemical substances manufactured in the production of frit.
(From US-EPA/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. ---"

SECTION I

MANUFACTURERS NAME: Ferro Corporation, Frit Division

MAIL: 4150 East 56th. Street
P.O. Box 6550
Cleveland, Ohio 44101

SHIP: 4150 East 56th. Street
Cleveland, Ohio 44105

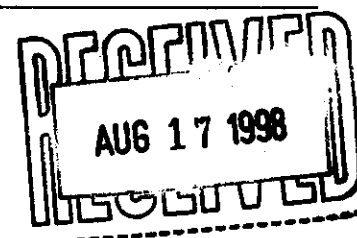
TELEPHONE: For chemical emergency, call CHEMTREC: (800) 424-9300
Ferro 24 hour Informational number: (216) 641-5324
Facility Informational number: (216) 641-8580

SECTION IIa - HAZARDOUS COMPONENTS

Frit is a fused silicate glass substance. The components of this glass product listed below are from the inventory of potentially hazardous substances referenced by FED-OSHA in 29 CFR 1910.1200.

COMPONENT:	Exposure Limit (Air), mg/m ³		
	ACGIH/TLV	FED-OSHA/PEL	CAL-OSHA/PEL
Barium, soluble compounds, as Ba Particulates not otherwise classified (Total Dust)	0.5 10/3 (r)	0.5 15.	0.5 10.

(r) Respirable



SECTION IIb - "SARA III" DATA

This product contains the following component(s) that require reporting under Section 313 of the Emergency Section of the Emergency Planning and Community Right-To-Know Act, also known as Title III of the SARA (Superfund Amendments and Reauthorization Act), and 40 CFR Part 372.

<u>COMPONENT:</u>	<u>PERCENT PRESENT:</u> (a)
Barium compounds	< 25.0% as Ba

(a) The percent reported is based on the theoretical composition of this frit. While existing in theory, the component(s) mentioned are only present as part of FRIT (CAS # 65997-18-4*).

SECTION III - PHYSICAL DATA

SPECIFIC GRAVITY (H₂O = 1) 1.6-3.0 MELTING POINT (° F.) > 1200

SOLUBILITY IN WATER Negligible

APPEARANCE AND ODOR Frit flake or milled glass powder / Odorless

Boiling Point / Vapor Pressure / Vapor Density / % Volatiles By Volume / Evaporation Rate
All N/A

SECTION IV - FIRE & EXPLOSION HAZARD DATA

FLASH POINT: N/A FLAMMABLE LIMITS: N/A

EXTINGUISHING MEDIA: None UNUSUAL FIRE & EXPLOSION HAZARDS: None

SECTION V - REACTIVITY DATA

STABILITY: Stable X Unstable N/A Conditions to avoid N/A

INCOMPATIBILITY: (Materials to avoid) N/A

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Avoid fumes from firing

HAZARDOUS POLYMERIZATION: Will not occur X Conditions to avoid N/A

SECTION VI - HEALTH HAZARD DATA

PRINCIPAL ROUTES OF ABSORPTION: Inhalation and Ingestion

EFFECTS OF OVEREXPOSURE:

Excessive ingestion of barium containing frit may cause inflammation of the gastrointestinal tract, muscular paralysis, slow pulse rate, irregular heart contractions, and low blood potassium levels.

Metal fumes from firing may cause lung inflammation and injury in terms of hours with symptoms of chest pains, chills, cough, headache, and diarrhea.

Prolonged contact with frit dust can be very irritating to the eyes and/or skin. High dust levels can be irritating to the respiratory tract.

With adequate ventilation, dust control, and good personal hygiene, symptoms of overexposure should not occur. Advise regular medical monitoring of employees by a physician competent in industrial health.

CARCINOGENICITY: N/A

EMERGENCY AND FIRST AID PROCEDURES: If overexposure is suspected move employee to fresh air; if breathing is difficult give oxygen. Call a physician. For dust in eyes; flush immediately with clean water and call a physician.

SOURCE OF HEALTH HAZARD DATA: This MSDS was developed from information on the constituent substances of this frit material, not from test data on the frit itself.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Uncontaminated material may be recovered and re-used. If contaminated scoop, vacuum, or wash into a receptacle for disposal.

WASTE DISPOSAL METHOD: Follow Federal or State and Local regulations for disposal. Barium is listed in US-EPA Code of Federal Regulations 40, Part 261.24. Testing of the waste may be required to determine status under the hazardous waste regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Protect containers against physical damage; store in dry area away from feed and food products.

OTHER PRECAUTIONS: Employees should wash and change into clean clothes before going home.

SECTION VIII CONTROL MEASURES

RESPIRATORY PROTECTION: (Specify type) Use a NIOSH approved dust and/or fume respirator as necessary.

VENTILATION: Local Exhaust - Recommended for dust control; vent dust to collector.

PROTECTIVE GLOVES: Use judgment - work gloves recommended.

EYE PROTECTION: Use judgement - safety glasses recommended.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Wear appropriate clean, protective clothing such as, but not limited to, coveralls, smocks, aprons, gloves, shoes and hats.

WORK/HYGIENIC PRACTICES: Food, beverages and smoking materials should NOT be in the work area. Hygiene is very important; employees should wash thoroughly before eating, drinking, smoking or applying cosmetics.

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Non-Standard Abbreviations Used on Material Data Sheets

ACGIH - American Conference of Government Industrial Hygienists

CAL/OSHA - California Occupational Safety and Health Administration

CAS # - Chemical Abstract Service Number

CFR - Code of Federal Regulations

FED/OSHA - Federal Occupational Safety and Health Administration

IARC - International Agency for Research on Cancer

MSDS - Material Safety Data Sheet

N/A - Not Applicable

NIOSH - National Institute for Occupational Safety and Health

NTP - National Toxicology Program (Department of Health and Human Services)

PEL - Permissible Exposure Limit

TSCA - Toxic Substances Control Act

TLV - Threshold Limit Value (registered terminology of ACGIH)

TWA - Time Weighted Average

US-EPA - United States Environmental Protection Agency