



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: F-227 G Granular Fertilizer Micronutrient
Chemical Name: Proprietary mixture of oxides and sulfates
Guaranteed Analysis: 40% Fe
CAS Registry Number: Proprietary
Product Use: Fertilizer Micronutrient Additive
Manufacturer/Supplier: Frit Industries Inc, PO Box 1589, Ozark, AL 36361-1589

Emergency Phone #s: **FOR CHEMICAL EMERGENCY**
(Spill, Leak, Fire, Exposure or Accident) **800-457-4280**
FOR MEDICAL/HANDLING EMERGENCIES
800-457-4280

Date of First Issue:	1-27-2010	Revision Number:	1
Revision Date:	02-03-2012		

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients (See Section 8 for Exposure Limits)	% (w/w)	CAS Number	Air Threshold Limit Value
Iron Oxide	50-60	1309-37-1	5.00 mg Fe/m ³
Iron Sulfate	5-10	7720-78-7	1.00 mg Fe/m ³
Zinc Oxide	3-7	1314-13-2	10.00 mg Zn/m ³
Zinc Sulfate	1-3	7733-02-0	10.00 mg Zn/m ³
Calcium Oxide	10-15	1305-78-8	2.00 mg Ca/m ³
Silica Dioxide	10-15	7631-86-9	10.00 mg/m ³



3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Dark Brown Granule. Not flammable or explosive, but will decompose in extreme heat to produce toxic sulfur oxide gas and metal fume. The granular solid or dust is relatively non-toxic to humans and poses little immediate hazard to emergency response personnel, but is partially soluble in water and can pose a threat to watercourses.

CAUTION! MAY CAUSE EYE, SKIN, AND RESPIRATORY IRRITATION.

- Avoid contact with skin and clothing. Wash after handling.
- Wear appropriate personal protective equipment. (See Section 8 for additional information)

Appearance and odor: SOLID BROWN GRANULES/SLIGHT METALLIC ODOR.

***** PROPOSITION 65 WARNING *****

This product contains chemicals known to the state of California to cause Cancer and/or birth defects or other reproductive harm.

POTENTIAL HEALTH EFFECTS (See Section 11 for additional information)

Primary Route (s) of Exposure: Skin contact, eye contact and inhalation

Acute Exposure:

- Inhalation Causes irritation to respiratory tract, symptoms may include coughing, sore throat, and shortness of breath.
- Eye Contact Dust may cause irritation.
- Skin Contact Dust may cause irritation.
- Ingestion Not likely to be toxic, but may cause irritation of the mouth, throat, and stomach.

Carcinogenicity: This product does not contain any carcinogens or potential carcinogens.

Chronic Effect/Developmental Can cause damage to respiratory system, urinary system, blood system, and reproductive system.

Medical Conditions Aggravated: Skin disorders, kidney disorders, or pulmonary function disorders.

POTENTIAL ENVIRONMENTAL EFFECTS (See Section 12 for additional information)

This material is a water pollutant. Do not let spilled or leaking material enter waterways.

4. FIRST AID MEASURES

Inhalation: Remove to fresh air. Seek medical attention immediately.

Eye Contact: Flush with water for 15 minutes. Do not rub eyes. Seek medical attention if irritation persists.

Skin Contact: Flush with water. If irritation develops, call physician.

Ingestion: Seek medical attention immediately.



5. FIRE FIGHTING MEASURES

Conditions of Flammability: Non-flammable
Flash Point (Method): N/A
Auto-Ignition Temperature: N/A
Extinguishing Media: This product is not flammable or combustible. If involved in a fire, use water fog or spray, dry chemical, foam or carbon dioxide extinguishing agents.

Fire Fighting Procedures: Wear self-contained breathing apparatus, approved by NIOSH. Do not wash material into any streams, waterways, drainage ditches, or storm sewers, etc. Impound liquids used in firefighting to prevent entry into streams, ditches, sewers, etc.

Fire & Explosion Hazards: Not flammable or explosive.
Hazardous Combustion Products: Oxides of sulfur, metal fume.

	Health:	Fire:	Reactivity:	Other:
NFPA Hazard Rating	1	0	0	None
<i>[0 – Minimal 1 – Slight 2 – Moderate 3 – High 4 – Extreme]</i>				

6. ACCIDENTAL RELEASE MEASURES

Spill/Leak: Safely stop source of spill. Restrict non-essential personnel from area. All personnel involved in spill clean up should avoid skin and eye contact by wearing appropriate personal protective equipment.

Cleanup: Sweep up spilled solid material, being careful not to create dust. Return sweepings to stock or, if contaminated, place into a chemical waste container for disposal according to local, state, and/or federal regulations.

7. HANDLING AND STORAGE

Store in cool, dry, well-ventilated area away from incompatible substances. Protect from physical damage. Avoid generating dust and the release of dust into the workplace. Refrain from eating, drinking, or smoking in work areas.



8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Applicable Exposure Limits:

- OSHA

Chemical Name	OSHA – PELS (mg / m ³)		ACGIH – TLVs (mg / m ³)		NIOSH – RELS (mg / m ³)	
	TWA	STEL/CEIL (C)	TWA	STEL/CEIL (C)	TWA	STEL/CEIL (C)
Iron Oxide	10	N/D	5	N/D	5	N/D
Iron Salts	N/D	N/D	1	N/D	1	N/D
Zinc compounds	15 Total 5 Respirable	N/D	2	10	5	15
Calcium Oxide	5	N/D	2	N/D	2	N/D
Silicon Dioxide	15 Total 5 Respirable	N/D	N/D	N/D	10 Total 5 Respirable	N/D

[Ref: ACGIH Guide to Occupational Exposure Values, 2006 Edition]

Legend:

CEIL:	Ceiling Exposure Limit	PEL:	Permissible Exposure Limit
STEL:	Short Term Exposure Limit	REL:	Recommended Exposure Limit
N/D	Not Determined	TLV:	Threshold Limit Value
ACGIH:	American Conference of Governmental Industrial Hygienists	TWA:	Time-Weighted Average
NIOSH:	National Institute for Occupational Safety and Health	WEEL:	Workplace Environmental Exposure Level
OSHA:	Occupational Safety and Health Administration		

Personal Protective Equipment (PPE)

- **Protective Clothing:** The hazard potential of this material is low. Where there is large-scale use of this material and significant potential for worker contact, gloves and long sleeved work clothes or disposable coveralls may be necessary. Eye protection should be worn where dust is generated and there is a potential that eye contact may occur.
- **Ventilation:** Use adequate local or general ventilation where necessary to maintain the concentrations of dust well below the recommended occupational exposure limits for general Particulates. Not Otherwise Specified (PNOS).
- **Respirators:** Where dust or fumes are generated and cannot be controlled to within acceptable levels by engineering means, use appropriate NIOSH-approved respiratory protection equipment (a 42CFR84 Class N, R or P-95 particulate filter cartridge).



9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State/Appearance/Odor:	Dark Brown granules/slight metallic odor	
Boiling Point:	N/A	
Bulk Density:	90 lbs/cubic foot	
Cloud Point:	N/D	
Evaporation Rate (Butyl Acetate=1):	N/A	
Melting Point:	N/A	
Odor Threshold:	N/A	
pH:	4 – 6.5	
Partition Coefficient (n-octanol/water):	N/A	
Pour Point:	N/A	
Solubility in water:	Partially soluble in water	
Solubility in other solvents:	N/A	
Specific Gravity (H ₂ O = 1) :	1.6	
Vapor Density (Air = 1):	N/A	
Viscosity:	N/A	
Volatiles (% by weight) :	N/A	
Other-Decomposition temperature	N/A	
Conditions of Flammability:	Nonflammable	
Flash Point (Method):	N/A	
Upper Flammable Limit (% by volume)	N/A	
Lower Flammable Limit (% by volume):	N/A	
Auto-Ignition Temperature	N/A	
<: less than	>: greater than	= : approximately

10. STABILITY AND REACTIVITY

Stability:	This product is stable at ambient temperatures and atmospheric pressures.
Incompatibilities/Conditions to avoid:	Avoid contact with strong alkaline or acid compounds.
Decomposition Products:	Metal and sulfur fumes when excessive heat is applied.



11. TOXICOLOGICAL INFORMATION

TOXICITY DATA

Ingredient Name	TEST	RESULT	ROUTE	SPECIES
Iron Sulfate	LD50	1520 mg/kg	ORL	MUS
	LD50	245 mg/kg	IPR	MUS
	LD50	51 mg/kg	IVN	MUS
Zinc Oxide	LD50	630 mg/kg	ORL	RAT
Zinc Sulfate	LD50	221 mg/kg	UNR	MAN
	LD50	1260 mg/kg	ORL	RAT
	LD50	2200 mg/kg	ORL	MUS
	LD50	200 mg/kg	IPR	RAT
Silica Dioxide	LD50	50 mg/kg	IPN	RAT
	LD50	15 mg/kg	IVN	RAT

- GENERAL:** The form in which this material is sold is considered to be relatively non-toxic.
- SKIN/EYE:** Direct contact may cause local irritation of the eyes and skin, but should not cause tissue damage.
- INHALATION:** Acute inhalation may result in irritation, but is not expected to cause significant harmful effects. Symptoms may include discomfort, coughing, sneezing, and shortness of breath.
- INGESTION:** Ingestion of large doses can irritate the stomach, resulting in abdominal pain, nausea, diarrhea, and vomiting.

12. ECOLOGICAL INFORMATION

- Ecotoxicity:** No data available on the mixture. Components within the mixture can be damaging to aquatic organisms.
- Chemical Fate:** The substance is not expected to enter the atmosphere.
- Biodegradation:** This product is not expected to be readily biodegradable based on structural condition.

13. DISPOSAL CONSIDERATIONS

- Waste & Container Disposal:** Do not wash down drain. Put uncontaminated material back into process if at all possible. Place contaminated material in suitable, labeled containers for disposal. Dispose of waste material consistent with the requirements of waste disposal authorities.



14. TRANSPORT INFORMATION

Shipping Information:	Not regulated for transport.
Required Labels:	N/A
Environmentally Hazardous Substances [49 CFR 172.101, Appendix A]:	N/A

15. REGULATORY INFORMATION

Regulatory Lists:		
Ingredients listed on TSCA inventory	YES	-----
Hazardous work hazard communication standard	NO	
CERCLA Section 103 Hazardous Substances	YES	Zinc Compounds
EPCRA Section 302 Extremely Hazardous Substance	NO	-----
EPCRA Section 311/312 Hazard Categories	NONE	
EPCRA Section 313 Toxic Release Inventory	YES	Zinc Compounds

Micronutrient Approvals / Registrations	
• California Department of Food and Agriculture (CDFA)	Company Registration# 2030

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

16. OTHER INFORMATION

Prepared by:	Frit Industries Inc., PO Box 1589, Ozark, AL 36361-1589 Ph: 334-774-2515
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The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport or otherwise be exposed to this product. All information concerning this product and/or all suggestions for handling and use contained herein are offered in good faith and are believed to be reliable as of the date of publication. Frit Industries, however, makes no warranty as to the accuracy of and/or sufficiency of such information and/or suggestions, as to the product's merchantability or fitness for any particular purpose, or that any suggested use will not infringe any patent. Nothing contained herein shall be construed as granting or extending any license under any patent. Buyer shall determine for himself, by preliminary tests or otherwise, the suitability of this product for his purposes, including mixing with other products. The information contained herein supersedes all previously issued bulletins on the subject matter covered.