



SAFETY DATA SHEET

Section 1: Identification

Product Name: Silicomanganese Slag

Chemical Name/Synonyms: Slag

Company: Felman Production, LLC

Address of Company/Manufacturer: 4442 Graham Station Rd., Letart, WV 25253

Potential Uses: Re-melt/reproduction, industrial fill, road base, textiles, etc.

In emergency call 911.

For information about this SDS call:

Andy Johnston

Felman Health & Safety Manager

Phone: 304-882-1424

Section 2: Hazard(s) Identification

Hazard Statements: This product does not represent a significant hazard to health, safety or the environment when handled and stored as advised (see section 7). Repeated, long term inhalation of manganese dust in excess of exposure limits may cause adverse health effects (See section 11). Flammable and noxious gases may be potentially formed in contact with moisture and/or acids.

This is for the potential hazardous for the slag that is generally produced. Various adjustments to fine tune production of specific alloy blends can result in various minor changes to the components, the general hazards included.

Section 3: Composition/ Information on Ingredients

Chemical Name: Silicomanganese slag

Typical Analysis (wt%):

| | |
|-----------------|---------|
| Silicon Oxide | 39-46% |
| Calcium Oxide | 18%-27% |
| Manganese Oxide | 5-16% |
| Magnesium Oxide | 6-9% |
| Aluminum Oxide | 1-9% |
| Iron Oxide | <2% |
| Potassium Oxide | <2% |
| Barium Oxide | <0.5% |

| Chemical Name | CAS# | |
|------------------|------------|--|
| Calcium Oxide | 1305-78-8 | |
| Manganese Oxide | 1317-35-7 | |
| Magnesium Oxide | 1309-48-4 | |
| Barium Oxide | 1304-28-5 | |
| Potassium Oxide | 12136-45-7 | |
| Iron Oxide | 1309-28-5 | |
| Silicon Oxide | 7631-86-9 | |
| Aluminum Oxide | 1344-28-1 | |
| Manganese Powder | 7439-96-5 | |

Section 4: First-Aid Measures

After skin contact:

Wash skin with water and/or a mild detergent. If irritation develops seek medical attention.

After eye contact:

Rinse eyes with large amounts of water/saline solution until no particles remain in eye. See physician on persistent feeling of discomfort if irritation occurs.

After inhalation: Emergency responders should use appropriate respiratory protection when moving an affected victim to fresh air. Give artificial respiration if breathing has stopped and call for prompt medical attention.

After swallowing: Incidental ingestion of small quantities of material fines does not represent a significant acute hazard. Appropriate PPE should be worn to avoid ingestion of fines. If large amounts are swallowed, get prompt medical attention.

Section 5: Fire-Fighting Measures

Combustibility:

Silicomanganese slag is not combustible.

Suitable extinguishing agents: Will not support combustion.

Suitable Protective Equipment: Combustion is not a hazard, but respiratory protection should be worn around dust.

Section 6: Accidental Release Measures

Land Spill:

Silicomanganese slag spilled on the land represents minimal hazard. Cleanup personnel should wear appropriate respiratory protective equipment when addressing fine material. Avoid the use of compressed air to maneuver spills or leaks of fine material. Keep dry material and wet material separated. Place recovered material in disposal container. Avoid repackaging wet materials in sealed containers.

Water Spill:

Remove spilled product from water body by dipping, filtering, or other appropriate means. Avoid repackaging wet materials in sealed containers.

Section 7: Handling and Storage

Handling: Avoid handling that generates dust build-up. Avoid inhalation of dust (see Section 8). Addition of wet product to molten metal may cause explosions (see Section 10).

Storage: Silicomanganese slag should be stored in a dry location at ambient temperatures. Avoid contact with hydrochloric acid (HCl) and nitric acid (HNO₃)

Section 8: Exposure Controls/Personal Protection

OCCUPATIONAL EXPOSURE LIMITS
8-hour TWA (mg/m³)
Based on general silicomanganese slag profile

| Ingredient | PEL* | TLV** | STEL**** | TWA***** |
|----------------------|------------------------------|------------|----------|----------|
| Manganese (Fume MnO) | | | 3 | 1 |
| Manganese (Dust) | C5*** | 5 | | |
| Iron (as Oxide Fume) | 10 (total) | 5 (total) | | |
| Carbon | 3.5 | | | |
| Silicon | 10 (total) 5 (respirable) | 10 (total) | | |

*Permissible Exposure Limit (mg/m³), OSHA 29CFR 1910.

**Threshold Limit Value (mg/m³), American Conference of Governmental Hygienists.

***Indicates ceiling value, at no time should exposure exceed this level.

****Short Term Exposure Limit (15 minutes) (mg/m³)

*****Time Weighted Average (mg/m³)

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Provide appropriate ventilation of confined spaces. Use explosion-proof ventilation equipment. See Section 2 for Component Exposure Guidelines.

PERSONAL PROTECTION:

Eye protection, eye flushing facilities and protective gloves are recommended. Ensure adequate ventilation. Wear an appropriate particulate respirator in accordance with 29 CFR 1910.134 or CSA Standard Z94.4-M1982 for dust exposure that may exceed exposure limits. Area and/or personal air monitoring is recommended to determine whether exposures are below permissible limits. If exposure to phosphine and arsine is suspected (see section 10), or if adequate ventilation is not possible, then a self-contained breathing apparatus or an air supplied respirator is recommended.

Section 9: Physical and Chemical Properties

Appearance: Solid green-black gravel material

Odor: Odorless

Odor threshold: NA

pH: Leachate generated from the slag is approximately 7.9-8.6 pH (estimate, samples are variable).

Solubility: Insoluble

Melting point/melting range: 1093-1232 °C

Flammability: Nonflammable

Danger of explosion: Addition of wet material to molten metal has the potential for explosions.

Relative density: Variable

Section 10: Stability and Reactivity

Chemical Stability and Reactivity: The slag is chemically stable and generally non-reactive.

Conditions to avoid: Addition of wet material to molten metal may cause explosions.

Incompatible materials: Avoid contact with water and/or acids.

Hazardous decomposition products: Highly flammable hydrogen gas (H₂) and the highly flammable and very toxic gases phosphine and arsine (garlic-like smell), both heavier than air, may be formed if silicomanganese slag comes in contact with moisture, acids, or bases. Contact with acids (pH<7) may result in generation of silane (SiH₄), a spontaneously combustible gas. Wet product will form highly flammable hydrogen gas if added to molten metal, due to decomposition of water.

Section 11: Toxicological Information

Acute toxicity

Potential routes of exposure/potential health effects

Skin: Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).

Eye: Dust may irritate and cause dryness but will not permanently injure eye tissue.

Inhalation: Fine dust may irritate and dehydrate mucous membranes.

Ingestion: Very unlikely, considered minimal hazard in normal industrial use.

Chronic Effects/Toxicity: Manganese poisoning can occur from excessive intake of manganese via inhalation and ingestion. The most notable effects of manganese poisoning are central nervous

system disorders which may occur as early as six months after initial exposure. Symptoms include apathy, drowsiness, sleep disturbance, muscular twitching, spastic gait, and emotion control problems. Permanent injury of the central nervous system may occur if chronic manganese poisoning is not treated. Silicomanganese slag is not known to be a reproductive toxin, teratogen, or mutagen.

Section 12: Ecological Information (non-mandatory)

Based on TCLP and totals analysis the slag is not characterized as hazardous to the environment. Very little chemicals leach out of this material due to its stable composition.

Section 13: Disposal Considerations (non-mandatory)

Material is generally safe to handle and should be disposed of in accordance with applicable federal, state, and local regulations. Silicomanganese slag is not a listed or characteristic RCRA Hazardous Waste (40 CFR 261).

Section 14: Transport Information (non-mandatory)

DOT regulations: Not Regulated

- **Hazard class:** Not Regulated
- **Land transport ADR/RID (cross-border):** NA
- **ADR/RID class:** NA
- **Maritime transport IMDG:** NA

Air transport ICAO-TI and IATA-DGR: NA

- **ICAO/IATA Class:** NA

Section 15: Regulatory Information (non-mandatory)

OSHA (Occupational Safety and Health Administration):
Hazardous by definition of hazardous communication standard (29 CFR 1910.1200)

TSCA (Toxic Substance Control Act):
Components of this product are listed on the TSCA Inventory.

CERCLA (Comprehensive Response Compensation, and Liability Act):
Silicomanganese slag is not found in "List of Hazardous Substances and Reportable Quantities" (40 CFR 302.4). No RQ has been assigned for the generic or broad class of "Manganese and Compounds".

RCRA (Resource Conservation/Recovery Act):

Silicomanganese slag is not a listed hazardous waste.

SARA TITLE III (Superfund Amendments and Reauthorization Act);
EPCRA (Emergency Planning and Community Right to Know Act):

311/312 Hazard Categories:

Immediate Health, Delayed Health, Fire.

313 Reportable Ingredients:

Manganese Compounds

CALIFORNIA PROPOSITION 65:

This product contains chemical(s) known to the State of California to cause cancer:

None

Section 16: Other Information

SDS date of preparation/update: 5/22/2023