## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

- **Product form**: Substance
- **Physical state**: Solid
- **Substance name**: FERROSILICON
- **Product code**: SIF4910.0
- **Formula**: FeSi2
- **Synonyms**: IRON SILICIDE
- **Chemical family**: INORGANIC SILICATE

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

- **Use of the substance/mixture**: Chemical intermediate
  - For research use only

### 1.3. Details of the supplier of the safety data sheet

**GELEST, INC.**
11 East Steel Road
Morrisville, PA 19067
USA
T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST
info@gelest.com - www.gelest.com

### 1.4. Emergency telephone number

- **Emergency number**: CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

**GHS-US classification**
- Water-react. 3: H261
- Acute Tox. 3 (Inhalation: dust, mist): H331

**Full text of H statements**: see section 16

### 2.2. Label elements

**GHS-US labeling**
- **Hazard pictograms (GHS-US)**: GHS02, GHS06
- **Signal word (GHS-US)**: Danger
- **Hazard statements (GHS-US)**: H261 - In contact with water releases flammable gases
  - H331 - Toxic if inhaled
- **Precautionary statements (GHS-US)**: P280 - Wear protective gloves/protective clothing/eye protection/face protection
  - P231+P232 - Handle under inert gas. Protect from moisture
  - P261 - Avoid breathing dust
  - P271 - Use only outdoors or in a well-ventilated area
  - P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
  - P311 - Call a doctor
  - P321 - Specific treatment (see first aid instructions on this label)
  - P370+P378 - In case of fire: Use media other than water to extinguish
  - P402+P404 - Store in a dry place. Store in a closed container
  - P403+P233 - Store in a well-ventilated place. Keep container tightly closed
  - P405 - Store locked up
  - P501 - Dispose of contents/container to licensed waste disposal facility

### 2.3. Other hazards

- No additional information available

### 2.4. Unknown acute toxicity (GHS US)

- No data available
SECTION 3: Composition/Information on ingredients

3.1. Substance

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
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<tbody>
<tr>
<td>Ferrosilicon</td>
<td>(CAS No) 8049-17-0</td>
<td></td>
<td>Water-react. 3, H261 Acute Tox. 3 (Inhalation), H331</td>
</tr>
</tbody>
</table>

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.

First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact : Wash with plenty of soap and water. Get medical advice/attention.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention.

First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Get medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : Toxic if inhaled. Danger of serious damage to health by prolonged exposure through inhalation. May cause irritation to the respiratory tract.

Symptoms/injuries after skin contact : May cause skin irritation. May be harmful in contact with skin.

Symptoms/injuries after eye contact : May cause eye irritation.

Symptoms/injuries after ingestion : May be harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Not combustible.

Unsuitable extinguishing media : Do not use straight streams.

5.2. Special hazards arising from the substance or mixture

Fire hazard : In contact with water releases flammable gases.

5.3. Advice for firefighters

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid contact with skin and eyes. Do not breathe dust.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Wear protective equipment as described in Section 8.

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for cleaning up : Sweep or shovel spills into appropriate container for disposal.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.
SECTION 7: Handling and storage

7.1. Precautions for safe handling
Additional hazards when processed: While not flammable, the ability of particles to generate static charge may present a hazard when used in combination with flammable liquids.
Precautions for safe handling: Avoid contact with skin and eyes. Do not breathe dust. Avoid dust formation. Handle under inert gas. Protect from moisture. Use only outdoors or in a well-ventilated area.
Hygiene measures: Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities
Storage conditions: Keep container tightly closed. Store locked up. Store in a dry place. Store in a closed container.
Incompatible materials: Acids.
Storage area: Store in a well-ventilated place. Store away from heat.

7.3. Specific end use(s)
No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Ferrosilicon (8049-17-0)</th>
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<tbody>
<tr>
<td>USA OSHA</td>
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</table>

8.2. Exposure controls
Appropriate engineering controls: Handle in an enclosing hood with exhaust ventilation.
Personal protective equipment: Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection: Neoprene or nitrile rubber gloves.
Eye protection: Chemical goggles. Contact lenses should not be worn.
Skin and body protection: Wear suitable protective clothing.
Respiratory protection: Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified dust and mist (orange cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties
Physical state: Solid
Appearance: Coarse. Powder.
Molecular mass: 112.02 g/mol
Color: Silver-gray.
Odor: No data available
Odor threshold: No data available
Refractive index: No data available
pH: No data available
Relative evaporation rate (butyl acetate=1): No data available
Melting point: 1360 °C
Freezing point: No data available
Boiling point: No data available
Flash point: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Flammability (solid, gas): No data available
Vapor pressure: < 0.01 mm Hg @ 20°C
Relative vapor density at 20 °C: No data available
Relative density: 4.75
VOC content: 100 %
Solubility: Insoluble in water.
Log Pow: No data available
Log Kow: No data available
Viscosity, kinematic: No data available
Viscosity, dynamic: No data available
Explosive properties: No data available
9.2. Other information
No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity
No additional information available

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Dry mixtures with sodium hydroxide react incandescently when water is added. Reacts with acids liberating hydrogen.

10.4. Conditions to avoid
No additional information available

10.5. Incompatible materials
Acids.

10.6. Hazardous decomposition products
None known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity: Inhalation: dust, mist: Toxic if inhaled.

FERROSILICON (8049-17-0)
ATE US (dust, mist) 0.500 mg/l/4h

Toxicity information
194 mg/m³ TOXICITY - Inhalation toxicity - rat: TCLo 6H/26W-i; LUNGS, THORAX, OR RESPIRATION: Other changes; LUNGS, THORAX, OR RESPIRATION: Changes in lung weight; BIOCHEMICAL: Metabolism (intermediary): Lipids, including transport;

Ferrosilicon (8049-17-0)
LD50 dermal rabbit > 20 g/kg
ATE US (gases) 700,000 ppmV/4h
ATE US (vapors) 3,000 mg/l/4h
ATE US (dust, mist) 0.500 mg/l/4h

Skin corrosion/irritation: Not classified
Serious eye damage/irritation: Not classified
Respiratory or skin sensitization: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified
Reproductive toxicity: Not classified
Specific target organ toxicity (single exposure): Not classified
Specific target organ toxicity (repeated exposure): Not classified
Aspiration hazard: Not classified
Symptoms/injuries after inhalation: Toxic if inhaled. Danger of serious damage to health by prolonged exposure through inhalation. May cause irritation to the respiratory tract.
Symptoms/injuries after skin contact: May cause skin irritation. May be harmful in contact with skin.
Symptoms/injuries after eye contact: May cause eye irritation.
Symptoms/injuries after ingestion: May be harmful if swallowed.

SECTION 12: Ecological information

12.1. Toxicity
No additional information available

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential
No additional information available

12.4. Mobility in soil
No additional information available
12.5. Other adverse effects

Other adverse effects : This substance may be hazardous to the environment.
Effect on ozone layer : No additional information available
Effect on the global warming : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Sewage disposal recommendations : Do not dispose of waste into sewer.
Waste disposal recommendations : Landfill. Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number

UN-No.(DOT) : 1408
DOT NA no. : UN1408

14.2. UN proper shipping name

Proper Shipping Name (DOT) : Ferrosilicon with 30 percent or more but less than 90 percent silicon
Class (DOT) : 4.3 - Class 4.3 - Dangerous when wet material 49 CFR 173.124
Hazard labels (DOT) : 4.3 - Dangerous when wet
6.1 - Poison

Packing group (DOT) : III - Minor Danger
DOT Packaging Exceptions (49 CFR 173.xxx) : 151
DOT Packaging Non Bulk (49 CFR 173.xxx) : 213
DOT Packaging Bulk (49 CFR 173.xxx) : 240

14.3. Additional information

Emergency Response Guide (ERG) Number : 139
Other information : No supplementary information available.

Transport by sea

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel
DOT Vessel Stowage Other : 13 - Keep as dry as reasonably practicable, 40 - Stow "clear of living quarters", 52 - Stow "separated from" acids, 53 - Stow "separated from" alkaline compounds, 85 - Under deck stowage must be in mechanically ventilated space, 103 - Only to be loaded under dry weather conditions

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 25 kg
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 100 kg

SECTION 15: Regulatory information

15.1. US Federal regulations

FERROSILICON (8049-17-0)

TSCA Exemption/Exclusion : CAUTION: This material is supplied for research and development purposes subject to the R&D exemption under TSCA, 40 CFR 720.36, and must meet the requirements of the exemption, including supervision by a "technically qualified individual" as defined by 40 CFR 720.3(ee). The use of this material for "commercial purposes" as defined by 40 CFR 720.3(r) is not permitted in the United States

15.2. International regulations
FERROSILICON
Safety Data Sheet

15.3. US State regulations

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</tr>
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<td>U.S. - California - Proposition 65 - Developmental Toxicity</td>
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</tr>
<tr>
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<td>No</td>
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<tr>
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Non-significant risk level (NSRL)

FERROSILICON (8049-17-0)

SECTION 16: Other information

Abbreviations and acronyms:
Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development.

Full text of H-phrases:

- H261: In contact with water releases flammable gases
- H331: Toxic if inhaled

HMIS III Rating

Health: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
Flammability: 3 Serious Hazard
Physical: 1 Slight Hazard

Prepared by safety and environmental affairs.

Date of issue: 05/23/2016

SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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