**Section 1 – Identification**

Product Identifier: Ferrosilicon  
Chemical Family: Metal Alloy  
Recommended Use: Additive to steel, and to steel and iron foundry products  
Restriction on Use: None identified

**Manufacturer Information**  
The David J. Joseph Company  
300 Pike Street  
Cincinnati, OH 45202  
Non-Emergency Contact: Safety Department  
Non-Emergency Phone: 513-419-6200  
Emergency Contact: DJJ  
Emergency Phone: 513-562-1699

**Section 2 – Hazard(s) Identification**

Classification  
The product does not meet the criteria for hazard classification in accordance with directive 1999/45/ED (DPD) and Regulation (EC) No1272/2008 (CLP).

GHS Label Elements  
Symbol(s)  
N/A  
Signal Word  
N/A  
Hazards Statement(s)  
Flammable and noxious gases may be formed in contact with moisture, acids or bases.  
Ferrosilicon dust suspended in air may under certain conditions cause dust explosions.

**Section 3 – Composition / Information on Ingredients**

<table>
<thead>
<tr>
<th>CAS</th>
<th>Component</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-21-3</td>
<td>Silicon</td>
<td>43-93%</td>
</tr>
<tr>
<td>7429-90-5</td>
<td>Aluminum</td>
<td>0% - 4%</td>
</tr>
<tr>
<td>7440-70-2</td>
<td>Calcium</td>
<td>0% - 2.5%</td>
</tr>
<tr>
<td>7439-96-5</td>
<td>Manganese</td>
<td>&lt;0.2%</td>
</tr>
<tr>
<td>7440-32-6</td>
<td>Titanium</td>
<td>&lt;0.15%</td>
</tr>
<tr>
<td>7440-50-8</td>
<td>Copper</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>7440-47-3</td>
<td>Chromium</td>
<td>&lt;0.3%</td>
</tr>
<tr>
<td>7440-44-0</td>
<td>Carbon</td>
<td>&lt;0.2%</td>
</tr>
<tr>
<td>7440-62-2</td>
<td>Vanadium</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>7439-89-6</td>
<td>Iron</td>
<td>Balance</td>
</tr>
</tbody>
</table>
**Section 4 – First Aid Measures**

**Inhalation**
Irritation caused by dust, move to fresh air. Seek medical attention if discomfort persists. Seek medical attention if Phosphine/Arsine intoxication is suspected. See section 11 for additional information.

**Skin Contact**
Wash skin with water and/or a mild detergent.

**Eye Contact**
Rinse eyes with water/saline solution. Seek medical assistance if discomfort persists.

**Ingestion**
Remove the person affected from dust exposed area. Seek medical attention if discomfort persists.

**Section 5 – Fire Fighting Measures**

**Extinguishing Media**
Dry sand, CO2 or dry powder.

**Unsuitable Extinguishing Media**
None identified.

**Specific Hazards Arising from the Chemical**
Dust particles suspended in air may cause dust explosion.

**Special Protective Equipment and Precautions for Firefighters**
None identified.

**Section 6 – Accidental Release Measures**

**Personal Precautions, Protective Equipment and Emergency Procedures**
None identified.

**Methods and Materials for Containment and Cleaning Up**
Material in the form of dust should be collected in suitable containers. Damp product should be kept away from dry, and must not be collected and stored in closed containers. Dry dust can be vacuumed or swept up.

**Section 7 – Handling and Storage**

**Precautions for Safe Handling**
Avoid handling that generates dust buildup. Avoid ignition sources in areas with high dust concentrations. Addition of wet materials to molten metal may cause explosion.

**Conditions for Safe Storage**
FeSi must be kept in a dry and well-ventilated place, and away from acids and bases.

**Incompatibilities**
Water/humidity, acids and bases.
**Section 8 – Exposure Controls / Personal Protection**

**Exposure Limits**

**Inhalable Dust**
8 hour TWA: 10 mg/m3.

**Respirable Dust**
8 hour TWA: 4 mg/m3.

**Phosphine Gas (PH3)**
8 hour TWA: 0.14 mg/m3; 0.1 ppm.
10 minute STEL: 0.28 mg/m3.
Indicative occupational exposure limit 8 hours: 0.14 mg/m3; 0.1 ppm.
Indicative occupational exposure limit 15 minutes: 0.28 mg/m3; 0.2 ppm.

**Arsine Gas (AsH3)**
8 hour TWA: 0.16 mg/m3; 0.05 ppm

**Appropriate Engineering controls**
Ensure good ventilation.

**Individual Protection Measures**

**Eyes/Face Protection**
Safety glasses.

**Skin Protection**
Protective gloves.

**Respiration**
Wear a particulate respirator in areas of poor ventilation. If exposure to phosphine and arsine is suspected in areas of poor ventilation, a self-contained breathing apparatus or an air fed respirator should be worn.

**Section 9 – Physical and Chemical Properties**

**Appearance:** Silvery grey, metallic surface, lump material, granulate, sieve fractions

**Physical state:** Solid
**Melting Point:** 1200-1400 C
**Flash Point:** N/A
**UFL:** Lowest explosive limit +/- 60 mg/m3
**Vapor Pressure:** N/A
**Specific Gravity:** 2.7-4.4
**Auto Ignition:** > 400 C
**pH:** 5.8
**Boiling Point:** N/A
**Flammability Class:** No ignition (Solid)
**LFL:** Lowest explosive limit +/- 60 mg/m3
**Vapor Density:** N/A
**Solubility (H2O):** 0.015 mg Si/l at pH 5.8, diameter <1mm

**Section 10 – Chemical Stability & Reactivity**

**Reactivity**
Reacts with moisture, acids and bases.

**Chemical Stability**
Stable.

**Possibility of Hazardous Reaction**
Highly flammable and very toxic gases phosphine and arsine (garlic like smell) may be formed if Ferrosilicon gets in contact with moisture, acids or bases. A prerequisite for phosphine and arsine gas
formation is the presence of reactive phosphides or arsenides at the alloy phase-boundaries inside the alloy. Very low levels of Phosphorous (<0.02%) and Arsenic (< 0.0005% detection limit) in Ferrosilicon, in combination with rapid solidification that limits segregation of the alloying elements, effectively minimize the formation of such compounds and thus the probability of gas formation. Reaction with hydrofluoric acid or nitric acid leads to the formation of toxic gases such as silicon tetrafluoride or nitrous gases.

**Conditions to Avoid**

Avoid generating sparks and other ignition sources in areas with high dust concentrations. Ferrosilicon particles suspended in air at concentrations above 100-300 g/m3 can cause dust explosions. For a given particle size, the ignition sensitivity and the violence of explosion decrease with decreasing Si/Fe ratio. Dust with Si/Fe ratio ≤ 2 and particle diameter > 0.01 mm is considered not to represent any danger of explosion. Addition of wet material to molten metal may cause explosions.

**Incompatible Materials**

- Water/humidity, acids and bases.

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**Section 11 – Toxicological Information**

Ferrosilicon does not meet the criteria for hazard classification, and there is no information on its toxicological characteristics. Toxicological information on its components can be found at http://www.cdc.gov/niosh/rtecs/

**Acute Dose Effects**

- **Inhalation**
  - Finely divided dust may irritate and dehydrate mucous membranes. Phosphine irritates exposed mucous membranes, depresses the central nervous system and can cause oedema of the lungs.
  - Acute, non-fatal poisoning with phosphine gives temporary effects, among others: headaches, malaise, vomiting, stomach pains, cough and difficulty breathing

- **Skin Contact**
  - Dust may irritate skin

- **Eye Contact**
  - Dust may irritate and lead to dryness

**Chronic Effects**

No adverse chronic effects of this product expected, based on both practical experience and review of available scientific literature.

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**Section 12 – Ecological Information**

**Ecotoxicity – Aquatic Toxicity**

The product is not characterized as dangerous to the environment.

**Persistence & Degradability**

Not relevant for the elements in this alloy.

**Bioaccumulation**

- Low mobility and non-dispersive use.

**Mobility**

- Poor mobility under normal environmental conditions.
**Section 13 – Disposal Considerations**

**Disposal Methods**
The material should be recovered for recycling where possible. Prior to disposal of large quantities, seek advice from the nearest Environmental Agency.

**US EPA Waste Number & Descriptions**
Waste from the product is not considered as hazardous.

**Section 14 – Transportation Information**

**Classifications**
- UN no. 1408
- IMO/BC-Code (30-90)% Si. Class 4.3
- BC-no. 022
- IMO/BC-Code (25-30 and >90)% Si, Class MHB

**Transportation Considerations**
Material must be stored under cover but in open air. Material must be in the particle size in which it is to be shipped, for no less than three days prior to shipment.

**Marine Pollutant Information**
FeSi is not considered to cause harm to aquatic organisms (Lillicrap, 2011). FeSi is not a marine pollutant.

**Section 15 – Regulatory Information**

**U.S. Federal Regulations**
No information.

**U.S. State Regulations**
No information.

**Section 16 – Other Information**
Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

The data on this sheet applies only to products sold by corporate subsidiaries of The David J. Joseph Company and may not apply to products sold by others.