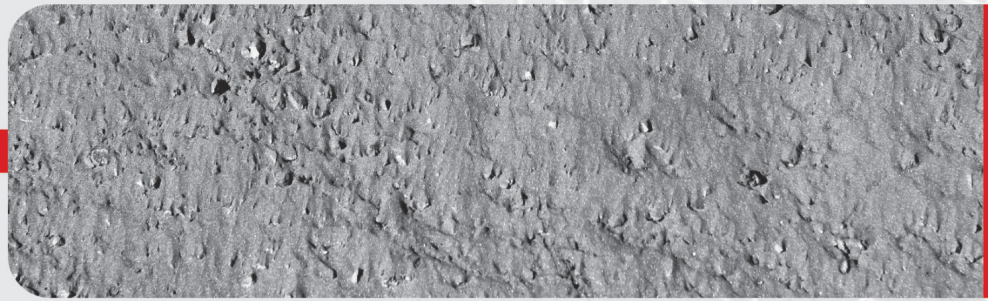
FERROSILICON

Ferrosilicon 10 - 60

Ferrosilicon 3 - 10

Ferrosilicon 0 - 3

Dust



Chemical Composition (Weight%)

According to ISO 5445 - 80

ISO	Si	Al	P	S	C	Mn	Cr	Ti	Fe
	%	%	Max%						
FeSi75Al 1	72 - 80	1	0.05	0.04	0.15	0.5	0.3	0.2	BAL
FeSi75Al 1.5	72 - 80	1 - 1.5	0.05	0.04	0.15	0.5	0.3	0.2	BAL
FeSi75Al 2	72 - 80	1.5 - 2	0.05	0.04	0.2	0.5	0.3	0.3	BAL
FeSi75Al 3	72 - 80	2 - 3	0.05	0.04	0.2	0.5	0.5	0.3	BAL

Physical Properties

Specific Gravity gr/cm^3	Bulk Density gr/cm^3	Melting Point °C
3.2	1.6	1240 - 1350

Main Application

- Deoxidizing Agent in Steel Production
- Silicon Additive for Production of Silicon Steel and High Silicon Cast Iron
- Inoculant Agent for Grey Cast Iron (GG , GGG & GGV)
- Master Alloy for Production of FeSiMg
- Graphite Electrode Production for Welding processes
- Magnesium Ingot

Packing Big Bag / Bulk

Ferrosilicon

1. Identification of the Product and Supplier

- Product name: **Ferrosilicon**
- Chemical Family: **Metal, Alloy**
- Synonyms/Trade names: **Ferro Silicon, FeSi, (FeSi % 75)**
- UN Number: **1408**
- CAS Number: **8049-17-0**

- Product application: **Additive to steel, and to steel and iron foundry products.**
- Address/Phone No.: **Iran Ferroalloy Industries Co. (IFI)**
  P.O. Box 15178/3169
  Tel: (+98 21) 88 77 93 30 – 88 78 70 33 – 88 77 42 71
  Fax:(+98 21) 88 88 20 43
  www.iranferroalloys.com

- Contact person: **Alaleh Shahani**, e-mail: shahani@iranferroalloys.com

2. Composition/Information on ingredients

Element	Symbol	CAS No.	Weight%
Silicon	Si	7440-21-3	72 - 80
Carbon	C	7440-44-0	< 0.20
Sulfur	S	7704-34-9	< 0.04
Phosphorus	P	7723-14-0	< 0.05
Aluminium	Al	7429-90-5	0 – 3
Calcium	Ca	7440-70-2	< 0.08
Manganese	Mn	7439-96-5	< 0.50
Chromium	Cr	7440-47-3	< 0.30
Titanium	Ti	7440-32-6	< 0.20
Iron	Fe	7439-89-6	Balance

3. Hazards Identification

Classification

- Physical Hazard: **Substance In Contact with Water Releases Flammable Gas** **Category 3**
- Health Hazard: **Acute Toxicity** **Category 3 (Oral, inhalation)**
- Label Elements Symbol

- Signal Word: **DANGER**

Hazard Statement(s)

- H261 **In contact with water releases flammable gas.**
- H301 **Toxic if swallowed.**
- H331 **Toxic if inhaled.**

Precautionary Statement(s)

- P232 **Protect from moisture.**
- P261 **Avoid breathing dust/fume/gas.**
- P264 **Wash hands thoroughly after handling.**
- P270 **Do not eat, drink or smoke when using this product.**
- P271 **Use only in a well-ventilated area**.
- P280 **Wear protective gloves/protective clothing/eye protection/face protection.**
- P301+P330+P331 **IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.**
- P304+P340 **IF INHALED: Remove victim to fresh air and keep at rest in position comfortable for breathing.**
- P310 **Immediately call a POISON CENTER or doctor.**
- P370+P378 **In case of fire: Use regular dry chemical, carbon dioxide, soda ash, lime or sand for extinction.**
- P402+P404 **Store in a dry place. Store in a closed container.**
- P405 **Store locked up.**
- P501 **Dispose of contents in accordance with federal, state, and local regulations.**
- Hazards Not Otherwise Classified: **Not applicable.**
- Ingredients(s) with Unknown Acute Toxicity: **Not applicable.**

4. First Aid Measures

- **INHALATION:**

Irritation caused by dust: Fresh air. See a physician on persistent feeling of discomfort. Phosphine/arsine intoxication: Seek medical attention (See Section 11).

- **SKIN CONTACT:**

Wash skin with water and/or a mild detergent.

- **EYE CONTACT:**

Rinse eyes with water/saline solution. See a physician on persistent feeling of discomfort.

- **INGESTION:**

Remove the person affected from dust-exposed area. See inhalation.

5. Fire Fighting Measures

Fire and Explosion Hazards: **Dust/air mixtures may ignite or explode. Ferrosilicon reacts with moisture or water releasing flammable and/or toxic gases.**

Extinguishing media: **Dry sand, CO2 or dry powder**

Dry FeSi in the form of lumps or granules is not combustible.

FeSi dust suspended in air may under certain conditions cause dust explosions (See section 10).

6. Accidental Release Measures

Material in the form of dust should be collected in suitable containers.

Damp product must be kept away from dry, and must not be collected and stored in closed containers.

Dry dust can be vacuumed or swept up.

7. Handling and Storage

Handling: Avoid handling that generates dust build-up.

Avoid inhalation of dust (See section 8). Avoid ignition sources (e.g. welding) in areas with high dust concentrations.

Addition of wet material to molten metal may cause explosions. See section 10.

Storage: FeSi must be kept in a dry and well-ventilated place, and away from acids and bases.

8. Exposure Controls/Personal Protection

Eye protection, eye flushing facilities and protective gloves.

Ensure good ventilation. Wear a particulate respirator according to 29CFR1910.134 or CSA Z94.4-M1982 in areas of inadequate ventilation.

If exposure to phosphine and arsine is suspected (see section 10) in areas of poor ventilation (e.g. storage holds, bunkers etc.), a self contained breathing apparatus or an air fed respirator should be worn.

Workplace Exposure Limits (HSE, EH40/2005)

Substance	CAS number	8 hour TWA		15 minute STEL	
		ppm	mg/m3	ppm	mg/m3
Inhalable dust	-	-	10	-	-
Respirable dust	-	-	4	-	-
Phosphine gas (PH3)	7803-51-2	0.1	0.14	0.2	0.28
Arsine gas (AsH3)	7784-42-1	0.05	0.16	-	-

EU OEL: Commission Directive 2006/15/EC

Substance	CAS number	8 hour		15 minute	
		ppm	mg/m3	ppm	mg/m3
Phosphine	7803-51-2	0.1	0.14	0.2	0.28

DNEL (Derived No Effect Level):

4 mg/m^3, proposal for inhalable FeSi particles (determined as Si).

0.3 mg/m^3, proposal for respirable FeSi particles (determined as Si).

9. Physical and Chemical Properties

Appearance:
Colour: Silvery grey
Form: Sieve fractions, fine.

Bulk density: 1.6 g/cm3

Specifc gravity (water = 1) Approx: 3.2

Melting Point (°C): 1240 -1350

10. Stability and Reactivity

Conditions to avoid:
Avoid generating sparks and other ignition sources (e.g. welding) in areas with high dust concentrations. FeSi-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.

Addition of wet material to molten metal may cause explosions.

Materials to avoid:
Water/humidity, acids and bases.

Hazardous decomposition products:
Highly flammable hydrogen gas (H2) and the highly flammable and very toxic gases phosphine (PH3) and arsine (AsH3) (garlic-like smell), may be formed if FeSi gets in contact with moisture, acids or bases.

Reaction with hydrofluoric acid (HF) or nitric acid (HNO_3) leads to the formation of toxic gases such as silicon tetrafluoride (SiF_4) or nitrous gases (NOx).

Wet product will form highly flammable hydrogen gas if added to molten metal, due to decomposition of water.

11. Toxicological Information

Acute effects:
Inhalation: Finely divided dust may irritate and dehydrate mucous membranes.
Phosphine/arsine may be absorbed from dust deposited on mucous membranes. Containers: Phosphine/arsine may be inhaled inside and close to newly opened inadequate ventilated containers. Phosphine irritates exposed mucous membranes, depresses the central nervous system (CNS) and can cause oedema of the lungs. Acute, non-fatal poisoning with phosphine gives temporary effects, among others headache, malaise, vomiting, stomach pains, cough, and difficulty in breathing.

Skin contact: Dust may irritate the 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. Historic, epidemiological studies covering cohorts of workers in the Norwegian ferro-alloy industry have been carried out as demonstrated by the list of reference literature, showing there is no cancer risk from this product.

12. Ecological Information

The product is not characterised as dangerous for the environment.

13. Disposal Considerations

The material should be recovered for recycling where possible.
Waste from the product is not considered as hazardous waste according to Commission Decisions 2000/532/EC and 2001/118/EC.

Prior to disposal of large quantities of this material, advice should be sought from the nearest Environment Agency.

14. Transport Information

DOT (DEPARTMENT OF TRANSPORTATION):

UN Number:	**1408**
Shipping Name:	**Ferrosilicon**
Hazard Class:	**4.3, Dangerous When Wet, Subsidiary risk, 6.1, Toxic**
I.D. Number and Initials:	**Not Regulated**
Packing Group:	**Group III**
Label(s):	**Not Regulated**

15. Regulatory Information

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 alloy 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 alloy is not a listed hazardous waste.

16. Other Information

The information presented in this Material Safety Data Sheet relates to this specific material. It may not be valid for this material if used in combination with any other materials or in any process. It is the user’s responsibility to verify the suitability and completeness of this information for the particular use intended.