MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**FERROSILICON**
Revision date	01-26-2012
Version #	01
CAS #	8049-17-0
Product use	Metallurgical applications.
Manufacturer/Supplier	ELFUSA GERAL DE ELETROFUSÃO LTDA JULIO MICHELAZZO, 501 - SÃO JOÃO DA BOA VISTA - SP -BRAZIL ZIP CODE 13872-900 SPAIN qualidade@elfusa.com.br Contact Person: RUBEN SINATO
Telephone	(+5519) 3634-2300
Emergency	1-866-519-4752 1-760-476-3962 Access Code: 333691

2. Hazards Identification

Physical state	Solid.
Appearance	Gray powder and grains.
Emergency overview	Low hazard under normal conditions.
OSHA regulatory status	This product is not hazardous according to OSHA 29CFR 1910.1200.
Potential health effects	
Routes of exposure	Inhalation. Ingestion. Skin contact. Eye contact.
Eyes	Dust may irritate the eyes.
Skin	Dust may irritate skin.
Inhalation	Dust may irritate the respiratory system.
Ingestion	Ingestion may cause irritation and malaise.
Target organs	Eyes. Skin. Reproductive system.
Chronic effects	Prolonged and repeated overexposure to dust can lead to pneumoconiosis.
Signs and symptoms	Irritation of eyes and mucous membranes. Irritation of nose and throat.
Potential environmental effects	Ecological injuries are not known or expected under normal use.
Health effects of additional components	
Aluminium	Signs and symptoms: Irritation of eyes and mucous membranes.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Ferrosilicon	8049-17-0	≤ 93.0
Impurities: P+Cr+Ca+Zr	N/A	≤ 1

Constituents

Chemical property	CAS #	Concentration (%)
Iron	7439-89-6	78
Aluminium	7429-90-5	2
Titanium	7440-32-6	2
Silicon	7440-21-3	15
Manganese	7439-96-5	1

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. For more detailed chemical composition, refer to the certificate of analysis.

4. First Aid Measures

First aid procedures

Eye contact Flush eyes thoroughly with water for at least 15 minutes. Get medical attention if irritation develops or persists.

Skin contact Wash with soap and water. Get medical attention if irritation develops or persists.

Inhalation Move to fresh air. Get medical attention if any discomfort continues.

Ingestion Immediately rinse mouth and drink plenty of water. Get medical attention if irritation develops and persists.

Notes to physician Treat symptomatically.

General advice Get medical attention if any discomfort develops.

5. Fire Fighting Measures

Flammable properties The product is not flammable.

Extinguishing media

Suitable extinguishing media Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media No restrictions known.

Protection of firefighters

Specific hazards arising from the chemical None known.

Protective equipment and precautions for firefighters Self-contained breathing apparatus, operated in positive pressure mode and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions Move containers from fire area if you can do it without risk.

6. Accidental Release Measures

Personal precautions Ensure adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

Environmental precautions Avoid release to the environment. Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Recover and recycle, if practical. Sweep up or vacuum up spillage and collect in suitable container for disposal. Do not vacuum clean unless vacuum cleaners are equipped with HEPA filter.

7. Handling and Storage

Handling Provide adequate ventilation. Use work methods which minimize dust production. Avoid inhalation of dust and contact with skin and eyes. Wear appropriate personal protective equipment. Do not add wet alumina to electrolysis cells. Observe good industrial hygiene practices.

Storage Store in a dry place.

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Material	Type	Value	Form
Ferrosilicon (8049-17-0)	TWA	1 mg/m3	Respirable fraction.

Constituents	Type	Value	Form
Aluminium (7429-90-5)	TWA	1 mg/m3	Respirable fraction.
Manganese (7439-96-5)	TWA	0.2 mg/m3	

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Material	Type	Value	Form
Ferrosilicon (8049-17-0)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.

Constituents	Type	Value	Form
Aluminium (7429-90-5)	PEL	5 mg/m3	Respirable dust.
		15 mg/m3	Total dust.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Constituents	Type	Value	Form
Manganese (7439-96-5)	Ceiling	5 mg/m3	Fume.
Silicon (7440-21-3)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Material	Type	Value
Ferrosilicon (8049-17-0)	TWA	10 mg/m3

Constituents	Type	Value	Form
Aluminium (7429-90-5)	TWA	5 mg/m3	Pyrophoric powder.
		10 mg/m3	Dust.
Manganese (7439-96-5)	TWA	0.2 mg/m3	

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Material	Type	Value	Form
Ferrosilicon (8049-17-0)	TWA	1 mg/m3	Respirable.

Constituents	Type	Value	Form
Aluminium (7429-90-5)	TWA	1 mg/m3	Respirable.
Manganese (7439-96-5)	TWA	0.2 mg/m3	

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Material	Type	Value	Form
Ferrosilicon (8049-17-0)	TWA	1 mg/m3	Respirable fraction.

Constituents	Type	Value	Form
Aluminium (7429-90-5)	TWA	1 mg/m3	Respirable fraction.
Manganese (7439-96-5)	TWA	0.2 mg/m3	
Silicon (7440-21-3)	TWA	10 mg/m3	Total dust.

Canada. Quebec OELS. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Material	Type	Value	Form
Ferrosilicon (8049-17-0)	TWA	10 mg/m3	Total dust.

Constituents	Type	Value	Form
Aluminium (7429-90-5)	TWA	5 mg/m3	Welding fume.
		10 mg/m3	
Manganese (7439-96-5)	STEL	3 mg/m3	Fume.
	TWA	5 mg/m3	Dust.
		1 mg/m3	Fume.
Silicon (7440-21-3)	TWA	10 mg/m3	Total dust.

Mexico. Occupational Exposure Limit Values

Material	Type	Value
Ferrosilicon (8049-17-0)	TWA	10 mg/m3

Constituents	Type	Value	Form
Aluminium (7429-90-5)	TWA	5 mg/m3	Welding fume.
		5 mg/m3	Pyrophoric powder.
		10 mg/m3	Dust.
Manganese (7439-96-5)	STEL	3 mg/m3	Fume.
	TWA	1 mg/m3	Fume.
		0.2 mg/m3	
Silicon (7440-21-3)	STEL	20 mg/m3	
	TWA	10 mg/m3	

Exposure guidelines No exposure standards allocated.

Engineering controls Provide sufficient ventilation for operations causing dust formation. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn.

Personal protective equipment

Eye / face protection Wear goggles/face shield.

Skin protection Wear suitable gloves. Suitable gloves can be recommended by the glove supplier. Wear suitable protective clothing.

Respiratory protection Seek advice from local supervisor.

General hygiene considerations	Wash hands after handling. Routinely wash work clothing and protective equipment to remove contaminants. Handle in accordance with good industrial hygiene and safety practice. Follow up on any medical surveillance requirements.

9. Physical & Chemical Properties

Appearance	Gray powder and grains.
Color	Gray.
Odor	Odorless.
Odor threshold	Not available.
Physical state	Solid.
Form	Powder and grains.
pH	9
Melting point	2732 °F (1500 °C)
Freezing point	Not available.
Boiling point	Not available.
Flash point	Not available.
Evaporation rate	Not applicable.
Flammability limits in air, upper, % by volume	Not available.
Flammability limits in air, lower, % by volume	Not available.
Vapor pressure	Not applicable.
Vapor density	Not applicable.
Specific gravity	6.91
Solubility (water)	Insoluble
Partition coefficient (n-octanol/water)	Not applicable.
Auto-ignition temperature	Not applicable.
Decomposition temperature	Not available.
Viscosity	Not applicable.
Bulk density	Not applicable.

10. Chemical Stability & Reactivity Information

Chemical stability	Stable at normal conditions.
Conditions to avoid	Moisture. Contact with incompatible materials.
Incompatible materials	None known.
Hazardous decomposition products	No hazardous decomposition products are known.
Possibility of hazardous reactions	Hazardous polymerization does not occur. Hazardous reactions do not occur.

11. Toxicological Information

Toxicological data

Product	Test Results
Ferrosilicon (8049-17-0)	Acute Oral LD50 Rat: > 5000 mg/kg

Acute effects	Dust may cause eye, skin and respiratory tract irritation.
Local effects	May cause irritation through mechanical abrasion.
Sensitization	No sensitizing effects known.
Chronic effects	Prolonged and repeated overexposure to dust can lead to pneumoconiosis.
Carcinogenicity	Test data conclusive but not sufficient for classification.

ACGIH Carcinogens

Aluminium (CAS 7429-90-5)	A4 Not classifiable as a human carcinogen.

Mutagenicity	Test data conclusive but not sufficient for classification.
Reproductive effects	Test data conclusive but not sufficient for classification.
Symptoms and target organs	Irritation of eyes and mucous membranes. Irritation of nose and throat.
Further information	Prolonged and repeated overexposure to dust can lead to pneumoconiosis.

12. Ecological Information

Ecotoxicity	This product has no known eco-toxicological effects. The product is not expected to be hazardous to the environment.
Environmental effects	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Aquatic toxicity	Not expected to be harmful to aquatic organisms.
Persistence and degradability	The product is not biodegradable.
Bioaccumulation / Accumulation	The product is not bioaccumulating.
Partition coefficient (n-octanol/water)	Not applicable.
Mobility in environmental media	The product is insoluble in water. Aluminum oxide is not mobile in the environment, unless it comes into contact with an aqueous environment with a pH below 5.5 or above 8.5.

13. Disposal Considerations

Disposal instructions	Dispose in accordance with all applicable regulations.
Waste from residues / unused products	Recover and recycle, if practical. Dispose of in accordance with local regulations.
Contaminated packaging	Offer rinsed packaging material to local recycling facilities. Dispose of in accordance with local regulations.

14. Transport Information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

TDG

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations

This product is not hazardous according to OSHA 29CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification(40 CFR 707, Subpt. D)

Not regulated.

US CAA Section 112 Hazardous Air Pollutants (HAPs) List

Manganese (CAS 7439-96-5)

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

Aluminium (CAS 7429-90-5)	1.0 %
Manganese (CAS 7439-96-5)	1.0 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Aluminium (CAS 7429-90-5)	Listed.
Manganese (CAS 7439-96-5)	Listed.

CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance (40 CRF 355, Appendix A)	No
Section 311/312 (40 CFR 370)	No
Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)	Not controlled
WHMIS status	Controlled
WHMIS classification	D1B - Immediate/Serious-TOXIC

WHMIS labeling

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - California Hazardous Substances (Director's): Listed substance

Aluminium (CAS 7429-90-5)	Listed.
Iron (CAS 7439-89-6)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Titanium (CAS 7440-32-6)	Listed.

US - Massachusetts RTK - Substance: Listed substance

Aluminium (CAS 7429-90-5)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Silicon (CAS 7440-21-3)	Listed.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

Aluminium (CAS 7429-90-5)	500 LBS
Manganese (CAS 7439-96-5)	500 LBS

US - New Jersey RTK - Substances: Listed substance

Aluminium (CAS 7429-90-5)	Listed.
Ferrosilicon (CAS 8049-17-0)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Silicon (CAS 7440-21-3)	Listed.
Titanium (CAS 7440-32-6)	Listed.

US - Pennsylvania RTK - Hazardous Substances: All compounds of this substance are considered environmental hazards

Manganese (CAS 7439-96-5)	LISTED

US - Pennsylvania RTK - Hazardous Substances: Listed substance

Aluminium (CAS 7429-90-5)	Listed.
Manganese (CAS 7439-96-5)	Listed.
Silicon (CAS 7440-21-3)	Listed.

16. Other Information

Recommended restrictions	-
HMIS® ratings	Health: 1 Flammability: 0 Physical hazard: 0
NFPA ratings	Health: 1 Flammability: 0 Instability: 0
Disclaimer	The information in the sheet was written based on the best knowledge and experience currently available.
Issue date	01-25-2012