NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
U.S. DEPARTMENT OF COMMERCE

Date of Issue:
23 September 2025

SAFETY DATA SHEET

1. Substance and Source Identification

Product Identifier

SRM Number: 59a
SRM Name: Ferrosilicon Grade E1 (powder form)
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended primarily for use in validation of chemical and instrumental methods of analysis. A unit of SRM 59a consists of a bottle containing approximately 50 g of powder.

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200
E-mail: SRMMSDS@nist.gov
Website: https://www.nist.gov/srm

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

2. 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.
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, and eye 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 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.

3. Composition and Information on Hazardous Ingredients

Substance: Ferrosilicon powder

Other Designations: Iron/silicon alloy.

Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Ferrosilicon	8049-17-0	not available	100
Components			
Silicon	7440-21-3	231-130-8	48
Iron	7439-89-6	231-096-4	50
Trace elements	not applicable	not applicable	2

4. First Aid Measures

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if needed. Thoroughly clean and dry contaminated clothing before reuse.

Eye Contact: Immediately flush eyes, including under the eyelids with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

Ingestion: If a large amount is swallowed, seek medical attention.

Most Important Symptoms/Effects, Acute and Delayed: Mechanical irritation.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek immediate medical attention.

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:
Suitable: Regular dry chemical, carbon dioxide, soda ash, lime or sand.
Unsuitable: Water, foam.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Avoid generating dust. Do not touch spilled material. Notify safety personnel of spills. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry. Keep spilled material dry.

7. HANDLING AND STORAGE

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection". Use methods to minimize dust.

Storage: Store and handling in accordance with all current regulations and standards. Keep separated from incompatible substances; see Section 10 "Stability and Reactivity" for incompatible substances.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

Component: No occupational limits established for ferrosilicon. The values below are listed for Particulates Not Otherwise Regulated.

NIOSH (REL):	10 mg/m^3 TWA (total dust); 5 mg/m^3 TWA (respirable dust).
ACGIH (TLV):	No exposure limits established.
OSHA (PEL):	15 mg/m^3 TWA (total dust); 5 mg/m^3 TWA (respirable fraction).

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties:	**Ferrosilicon**
Appearance (physical state, color, etc.):	brown, fine powder
Molecular Formula:	Fe/Si alloy
Molar Mass (g/mol):	not available
Odor:	odorless
Odor threshold:	not applicable
pH:	not applicable
Evaporation rate (ether = 1):	not available
Melting point/freezing point (ºC):	1410 (2570 ºF)
Relative Density (g/L):	5.4
Vapor Pressure (mmHg):	1 mmHg (1724 ºC)
Vapor Density (air = 1):	not applicable
Viscosity (cP):	not applicable
Solubility(ies):	not available
Insoluble	water
Partition coefficient (n-octanol/water):	not available
Particle Size (if relevant)	not available

Thermal Stability Properties:	Ferrosilicon
Autoignition Temperature (ºC):	not available
Thermal Decomposition (ºC):	not applicable
Initial boiling point and boiling range (ºC):	not available
Explosive Limits, LEL (Volume %):	not available
Explosive Limits, UEL (Volume %):	not available
Flash Point (ºC)	not applicable
Flammability (solid, gas):	not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: Dust/air mixtures may ignite or explode. Ferrosilicon containing 30 % to 75 % silicon reacts with water or moisture releasing flammable hydrogen gas, and toxic arsine and phosphine. Heat generated may be sufficient to ignite the hydrogen gas generated.

Conditions to Avoid: Avoid generating dust. Avoid contact with water or moisture.

Incompatible Materials: Water, acids, bases, oxidizing materials.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition will produce oxides of silicon and iron.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin X Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Mechanical irritation.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Acute exposure to dust may result in mucous membrane irritation. No information listed for chronic exposure to ferrosilicon.

Skin Contact: Contact may cause mechanical irritation. No data listed for chronic exposure.

Eye Contact: Dust may cause irritation through mechanical abrasion. No data listed for chronic exposure.

Ingestion: Ingestion may cause digestive tract irritation. No data listed for chronic exposure.

Numerical Measures of Toxicity:

Acute Toxicity: Category 3 (Oral, inhalation)
Category 3 classification is based on U.S. Department of Transportation classification; see section 14 "Transportation Information".

Skin Corrosion/Irritation: No data available.

Serious Eye damage/ Eye irritation: No data available.

Respiratory Sensitization: No data available.

Skin Sensitization: No data available.

Germ Cell Mutagenicity: No data available.

Carcinogenicity: Not classified.
Listed as a Carcinogen/Potential Carcinogen _____ Yes X No
Ferrosilicon is not listed in NTP, IARC, or OSHA as a carcinogen.

Reproductive Toxicity: Not classified.

Specific Target Organ Toxicity, Single Exposure: Not classified.

Specific Target Organ Toxicity, Repeated Exposure: Not classified.

Aspiration Hazard: Not applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Component: Ferrosilicon: No data available.

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations. Ferrosilicon subject to disposal regulations: U.S. EPA 40 CFR 262, Hazardous Waste Number: D001

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: UN1408, Ferrosilicon, Hazard Class 4.3, Dangerous When Wet, Subsidiary risk 6.1, Toxic, Packing Group III.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	Yes.
CHRONIC HEALTH:	No.
FIRE:	Yes.
REACTIVE:	Yes.
PRESSURE:	No.

State Regulations:

California Proposition 65: Not listed.

U.S. TSCA Inventory: Ferrosilicon is not listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations:

WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 23 September 2025

Sources: ChemAdvisor, Inc., SDS *Ferrosilicon*, 09 December 2015.

CAMEO Chemicals Chemical Datasheet, *Ferrosilicon;* available at https://cameochemicals.noaa.gov/chemical/17269 (accessed Sep 2025).

Guide 139, *Substances-Water-Reactive (Emitting Flammable And Toxic Gases);* 2024 Emergency Response Guidebook, U.S. Department of Transportation, pp 208-209, (2024); available at https://www.phmsa.dot.gov/training/hazmat/erg/erg2024-pdf-accessible-english (accessed Sep 2025).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transport Association	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NIOSH	National Institute for Occupational Safety and Health	TWA	Time Weighted Average
NIST	National Institute of Standards and Technology	UEL	Upper Explosive Limit
n.o.s.	Not Otherwise Specified	WHMIS	Workplace Hazardous Materials Information System