

## SAFETY DATA SHEET

### 1. SUBSTANCE AND SOURCE IDENTIFICATION

**Product Identifier**

**SRM Number:** 1900  
**SRM Name:** Silicon Nitride Powder-Specific Surface Area Standard  
**Other Means of Identification:** Not applicable.

**Recommended Use of This Material and Restrictions of Use**

Standard Reference Material (SRM) 1900 is intended for use in the calibration of instruments used to measure specific surface area (SSA) in the range of 0.1 m<sup>2</sup>/g to 1000 m<sup>2</sup>/g. A unit of SRM 1900 consists of a single bottle containing approximately 4 g of silicon nitride 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  
 FAX: 301-948-3730  
 E-mail: SRMMSDS@nist.gov  
 Website: <http://www.nist.gov/srm>

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

### 2. HAZARDS IDENTIFICATION

**Classification**

**Physical Hazard:** Not classified.  
**Health Hazard:** Not classified.

**Label Elements**

**Symbol:** No symbol.  
**Signal Word:** No signal word.  
**Hazard Statement(s):** No applicable hazard statements.  
**Precautionary Statement(s):** No applicable precautionary statements.  
**Hazards Not Otherwise Classified:** None.  
**Ingredients(s) with Unknown Acute Toxicity:** None.

### 3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

**Substance:** Silicon nitride

**Other Designations:** Trisilicon tetranitride; silicon nitride (Si<sub>3</sub>N<sub>4</sub>).

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Silicon nitride	12033-89-5	234-796-8	100

### 4. FIRST AID MEASURES

**Description of First Aid Measures**

**Inhalation:** If adverse effects occur, remove to well-ventilated (uncontaminated) area. If breathing is difficult, qualified personnel may administer oxygen. If not breathing, qualified personnel should give artificial respiration. Seek immediate medical attention.

**Skin Contact:** Rinse affected skin thoroughly with soap or mild detergent and water for at least 15 minutes. If skin irritation persists, seek medical aid and bring the container or label.

**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:** May cause 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.

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## 5. FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** Slight fire hazard; sufficient concentrations of dust/air mixtures might ignite or explode if in the presence of an ignition source.

### Extinguishing Media

Suitable: Regular dry chemical, carbon dioxide, water, or regular foam.

Unsuitable: None listed.

**Specific Hazards Arising from the Chemical:** Not applicable.

**Special Protective Equipment and Precautions for Fire-Fighters:** Move container from fire area if it can be done without personal risk. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

**NFPA Ratings** (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1                  Fire = 0                  Reactivity = 0

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## 6. ACCIDENTAL RELEASE MEASURES

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**Personal Precautions, Protective Equipment and Emergency Procedures:** Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

**Methods and Materials for Containment and Clean up:** Avoid generating and accumulating dust. Collect in appropriate container for disposal.

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## 7. HANDLING AND STORAGE

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**Safe Handling Precautions:** See Section 8, "Exposure Controls and Personal Protection".

**Storage and Incompatible Materials:** Avoid generating dust. Store and handle in accordance with all current regulations and standards.

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## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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**Exposure Limits:** No occupational exposure limits established for silicon nitride powder. OSHA lists the following exposure limits for Particulates Not Otherwise Regulated.

OSHA (PEL): 15 mg/m<sup>3</sup> TWA (total particulates)  
5 mg/m<sup>3</sup> TWA (respirable particulates)

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

**Personal Protection Measures:** 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 Protection:** Splash resistant safety goggles and emergency eyewash are recommended.

**Skin and Body Protection:** Chemical resistant clothing and gloves are recommended.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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Properties	Silicon Nitride
Molar Mass (g/mol)	140.28
Molecular Formula	N <sub>4</sub> Si <sub>3</sub>
Appearance (physical state, color, etc.)	solid, white to gray, amorphous powder
Odor	not available
Odor threshold	not available
pH	not available
Evaporation rate	not available
Melting point/freezing point	not available
Sublimation	1900 °C (3452 °F)
Relative Density (specific gravity)	3.44
Density	not available
Vapor Pressure	not available
Vapor Density (air = 1)	not available
Viscosity	not available
Solubilities	water: insoluble solvent: hydrofluoric acid
Partition coefficient (n-octanol/water)	not available
<b>Thermal Stability Properties</b>	
Autoignition Temperature	not available
Thermal Decomposition	not available
Initial boiling point and boiling range	not available
Explosive Limits, LEL (Volume %)	not available
Explosive Limits, UEL (Volume %)	not available
Flash Point	not available
Flammability (solid, gas)	not available

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** This material is not reactive at normal temperatures and pressure.

**Stability:**      Stable            Unstable

**Possible Hazardous Reactions:** Not applicable.

**Conditions to Avoid:** Avoid generating dust.

**Incompatible Materials:** None listed.

**Hazardous Decomposition:** Oxides of nitrogen.

**Hazardous Polymerization:**      Will Occur            Will Not Occur

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Exposure:**    Inhalation        Skin            Ingestion

**Symptoms Related to the Physical, Chemical and Toxicological Characteristics:** Eye or skin mechanical irritation.

**Potential Health Effects (Acute, Chronic, and Delayed)**

**Inhalation:** May cause irritation.

**Skin Contact:** May cause irritation.

**Eye Contact:** May cause irritation.



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## 16. OTHER INFORMATION

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**Issue Date:** 01 May 2014

**Sources:** ChemADVISOR, Inc., MSDS *Silicon Nitride*, 21 March 2014.

### Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	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
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 Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration	STEL	Short Term Exposure Limit
LD50	Median Lethal Dose or 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
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System
n.o.s.	Not Otherwise Specified		

**Disclaimer:** Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The values for this material are given in the NIST Certificate.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail [srmmsds@nist.gov](mailto:srmmsds@nist.gov); or via the Internet at <http://www.nist.gov/srm>.