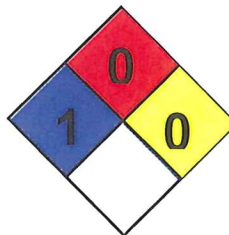


## Doped Polycrystalline Silicon

In an emergency, call MEMC at 636-474-5000



### SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Doped Polycrystalline Silicon (Phosphorus, Boron)

**Chemical Name:** Silicon

**Chemical Formula:** Si

**Synonyms:** Polysilicon, Silicon

**Company Name:** MEMC Electronic Materials, Inc.  
501 Pearl Drive  
St Peters, MO 63376  
636-474-5000

### SECTION 2: COMPOSITION & INFORMATION ON INGREDIENTS

Substance Name	Contents	CAS No.	OSHA PEL	ACGIH TLV
Silicon	>99%	7440-21-3	15 mg/m <sup>3</sup> (total dust) 5 mg/m <sup>3</sup> (respirable dust)	Not established
Boron	<1%	7440-42-8	Not established	Not established
Phosphorus	<1%	7723-14-0	Not established	Not established

### SECTION 3: HAZARDS IDENTIFICATION

**NFPA 704 Rating:** Health 1, Fire 0, Reactivity 1, Special None

**Health Effects or Risks From Exposure:** Causes respiratory tract irritation.

## Doped Polycrystalline Silicon

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### **SECTION 4: FIRST AID MEASURES**

<b>Inhalation:</b>	Remove to fresh air. If breathing is difficult, give oxygen and seek medical attention.
<b>Eye Contact:</b>	Flush with copious amounts of water for at least 15 minutes. If irritation persists, seek medical attention.
<b>Skin Contact:</b>	Remove contaminated clothing. Wash affected area with soap and water. Rinse thoroughly. If irritation persists or other symptoms are observed, seek medical advice.
<b>Ingestion:</b>	Rinse out mouth and drink copious amounts of water. In case of irritation or other symptoms, seek medical attention.

### **SECTION 5: FIRE FIGHTING MEASURES**

<b>Flammability Classification (Per 49 CFR Part 173 Subpart D):</b>	Material is not flammable according to definition of a flammable solid in 49 CFR, Part 173, Subpart D.
<b>Known or Anticipated Hazardous Products of Combustion:</b>	None listed
<b>Extinguishing Media:</b>	Dry chemical or carbon dioxide. In general, water based extinguishing media should not be used for this material.
<b>Fire Fighting Instructions:</b>	Use firefighting measures which suit the environment and take into account other materials which may be involved. Wear self-contained breathing apparatus and protective clothing.

### **SECTION 6: ACCIDENTAL RELEASE MEASURES**

<b>Personnel Protection:</b>	Wear protective equipment including rubber gloves and eye protection. Ensure adequate ventilation. Keep unprotected personnel away.
<b>Environmental Protection:</b>	Take precautions to ensure material does not contaminate the ground or enter the drainage system.
<b>Cleanup/Collection:</b>	Ensure adequate ventilation. Avoid raising dust. Transfer material to sealed containers for disposal.

## Doped Polycrystalline Silicon

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### **SECTION 7: HANDLING AND STORAGE**

- Handling:** Avoid contact with eyes, skin and clothing. Avoid generation of dust. Keep containers tightly sealed.
- Storage:** Store in a cool, dry location away from heat, sparks, and open flame. Do not store with oxidizing agents, halogens or acids.

### **SECTION 8: EXPOSURE CONTROL/PERSONAL PROTECTION**

- Ventilation and Engineering Controls:** Use general or local exhaust ventilation if necessary. Material transfer and dust collection equipment should be constructed of conductive materials and electrically interconnected (bonded) and grounded.
- Respiratory Protection:** Wear NIOSH (U.S.) or CEN (EU) approved dust respirator if exposure exceeds occupational exposure limit.
- Eye Protection:** Splash goggles or safety glasses.
- Hand Protection:** Wear chemical resistant gloves.
- Body Protection:** Use body protection appropriate for task. An apron or other impermeable body protection is suggested.
- General Hygiene Measures:** Keep away from foodstuffs, beverages and feed. Remove all soiled/contaminated clothing immediately. Wash hands before breaks and at the end of work. Avoid contact with eyes and skin.

### **SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

- Appearance:** Steel grey powder or crystals
- Odor:** Odorless
- Physical state at atmospheric conditions:** Solid
- pH:** Not applicable
- Sublimation Temperature (at 1 atm):** Not determined
- Solubility in Water:** Insoluble
- Melting Point:** 1410° C (2750° F)
- Boiling Point:** 2355° C (4271° F)
- Specific gravity/Density:** 2.33 g/cm<sup>3</sup> at 20° C (68° F)
- Molecular Weight:** 28.1 (silicon)
- Flammability:** Not applicable
- Flash Point:** Not applicable
- Flammability Limits in Air:** Not applicable
- Auto Ignition Temperature:** Not applicable

## Doped Polycrystalline Silicon

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### **SECTION 10: STABILITY AND REACTIVITY**

<b>Chemical Stability:</b>	Stable
<b>Conditions to Avoid:</b>	Avoid generation of airborne dusts. When heated, silicon will react with water to produce flammable and/or explosive hydrogen gas.
<b>Incompatibility with Other Materials:</b>	Water, alkali metals, oxidizing agents, acids, basis, interhalogens, halogens.
<b>Hazardous Decomposition, Reaction And Oxidation (other than burning) Products:</b>	Not known
<b>Hazardous Polymerization:</b>	Will not occur.

### **SECTION 11: TOXICOLOGICAL INFORMATION**

<b>RTECS Number:</b>	VW0400000 (Silicon)
<b>Acute Toxicity:</b>	Oral, LD50, 3160 mg/kg, rat
<b>Chronic and Subchronic Data:</b>	Elementary silicon is an inert material that seems to have little adverse effect on lungs and does not appear to produce significant organic disease or toxic effects when exposures are kept under reasonable control.
<b>Special Studies:</b>	None known to MEMC Pasadena, Inc.
<b>Suspected cancer agent:</b>	Silicon, boron, and phosphorus are not found on the following lists: FEDERAL OSHA Z LIST, IARC, NTP, and California and therefore are neither considered to be nor suspected to be a cancer-causing agent by these agencies.
<b>Irritancy of product:</b>	Silicon is irritating to respiratory system.
<b>Sensitization of product:</b>	Silicon is not known to be a sensitizer to humans upon prolonged or repeated contact.
<b>Reproductive toxicity information:</b>	Listed below is information concerning the effects of Silicon on the human reproductive system.
<b>Mutagenicity:</b>	No human mutagenic effects have been described for Silicon.
<b>Embryotoxicity:</b>	No human embryotoxic effects have been described for Silicon.
<b>Teratogenicity:</b>	No human teratogenic effects have been described for Silicon.
<b>Reproductive Toxicity:</b>	No human reproductive effects have been described for Silicon.

## Doped Polycrystalline Silicon

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### **SECTION 12: ECOLOGICAL INFORMATION**

**Ecological Effects:** Take care to prevent material from entering the ground, water courses or drainage systems.

### **SECTION 13: DISPOSAL CONSIDERATIONS**

Consult local, state or national regulations to endure proper disposal.

### **SECTION 14: TRANSPORTATION INFORMATION**

This material is considered as non-hazardous and non-regulated as defined by 49 CFR 172.101.

### **SECTION 15: REGULATORY INFORMATION**

**ADDITIONAL U.S. REGULATIONS:**

**U.S. Sara Reporting Requirements:** Silicon, boron, and phosphorus are subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

<u>CHEMICAL NAME</u>	<u>SARA 302</u> (40 CFR 355, Appendix A)	<u>SARA 304</u> (40 CFR Table 302.4)	<u>SARA 313</u> (40 CFR 372.65)
Silicon	No	No	No
Boron	No	No	No
Phosphorus	Yes	Yes	Yes

**U.S. SARA Threshold Planning Quantity:** 100 lbs. (Phosphorus)

**U.S. CERCLA Reportable Quantity (RQ):** 1 lb. (Phosphorus)

**U.S. TSCA Inventory Status:** Silicon, phosphorus and boron are listed on the TSCA Inventory.

**Other U.S. Federal Regulations:** Silicon is not subject to the reporting requirements of CFR 29 1910.1000.

**California Safe Drinking Water and Toxic Enforcement Act (Proposition 65):** These compounds are not on the California Proposition 65 list.

**Pennsylvania Right To Know:** Silicon, Boron, Phosphorus

**New Jersey Right To Know:** Silicon, Boron, Phosphorus

**Canadian Regulatory Information:** This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL – Yes, Silicon, Phosphorus, Boron NDSL – No.

**E.U. Risk Phrases:** 37 Irritating to respiratory system.

### **SECTION 16: OTHER INFORMATION**

**Disclaimer**

MEMC Pasadena, Inc. cannot guarantee that these are the only hazards that exist. Users are solely responsible for the safe storage, handling, use and disposal of this material, and for compliance with the applicable laws, regulations and accepted practices. MEMC Pasadena, Inc. makes no representations or warranties; either expressed or implied, of merchantability, fitness for a particular purpose, or any other nature.

