

SECTION 1: Identification of the substance/mixture and of the company/undertaking**Product Identifier****Material Name**

Silicon Carbide Infiltrated/Coated Graphite

Product Use

Semiconductor and industrial applications

Restrictions on Use

None known.

Supplier Information

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SECTION 2: Hazards identification**Hazard/Risk Classification**

None needed according to classification criteria.

Label elements**Hazard symbols**

None needed according to classification criteria.

Signal word

None needed according to classification criteria

Hazard/Risk Statement

None needed according to classification criteria.

Precautionary statements**Prevention**

None needed according to classification criteria.

Response

None needed according to classification criteria.

Storage

None needed according to classification criteria.

Disposal**P501** Dispose of contents/container in accordance with local/regional/national/international regulations (depending on the information set out in the Waste Control Act).**Other Hazards Which Do Not Result in Classification**

None known.

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SECTION 3: Composition / information on ingredients

CAS	Chemical name	Other Names	Percent
7782-42-5	Graphite	--	90-99
409-21-2	Silicon carbide	--	1-10

Impurities and stabilizing additives contributing to the GHS Classification

None

SECTION 4: First aid measures**Eye contact**

Flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Then get 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 and shoes before reuse.

Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Ingestion

If swallowed, get medical attention.

Most Important Symptoms/Effects**Symptoms: Immediate**

No information on significant adverse effects.

Symptoms: Delayed

No information on significant adverse effects.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically and supportively.

SECTION 5: Firefighting measures**Suitable extinguishing media**

Use extinguishing agents appropriate for surrounding fire.

Unsuitable Extinguishing Media

None known.

Specific hazards arising from the chemical

Negligible fire hazard.

Protective Equipment and Precautions for Firefighters

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Fire Fighting Measures

Move container from fire area if it can be done without risk. Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products. Dike for later disposal.

Combustion

oxides of carbon, oxides of silicon

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SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear personal protective clothing and equipment. Minimize dust generation and accumulation. Keep unnecessary people away, isolate hazard area and deny entry. Provide adequate ventilation. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Non-sparking tools should be used when working with dust. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Environmental precautions

Avoid release to the environment.

Methods for Containment

Keep unnecessary people away, isolate hazard area and deny entry. If sweeping of a contaminated area is necessary, use a dust suppressant agent. Collect spill using a vacuum cleaner with a HEPA filter or wet and scoop up dry spills. Avoid sweeping spilled dry material. Eliminate ignition sources including sources of electrical, static or frictional sparks. Keep out of water supplies and sewers. Prevent entry into waterways, sewers, basements, or confined areas. Avoid accumulation of airborne dusts. Small spills: Move containers away from spill to a safe area. Vacuum or sweep up material and place in a designated, labeled waste container. Large spills: If emergency personnel are unavailable vacuum or carefully scoop up spilled materials and place in an appropriate container for disposal. Avoid creating dusty conditions and prevent wind dispersal.

SECTION 7: Handling and storage
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Precautions for safe handling

Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

None needed according to classification criteria.

Store in accordance with all current regulations and standards. Store in a well-ventilated area. Keep container tightly closed. Store in a cool, dry place. Maintain graphite blocks in stable position. Any machine generated dust should be maintained in closed container. Maintain blocks as shipped, no specific handling or storage identified. Keep separated from incompatible substances. Follow MSDS and warning labels even when containers are empty.

Incompatible Materials

oxidizing materials

SECTION 8: Exposure controls/personal protection

Exposure Guidelines

Component Exposure Limits

Graphite	7782-42-5
Korea:	2 mg/m ³ TWA (synthetic, except graphite fibers) respirable fraction
ACGIH:	2 mg/m ³ TWA (all forms except graphite fibers) respirable particulate matter
Silicon carbide	409-21-2

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Korea:	10 mg/m ³ TWA (limited to fibrous materials)
ACGIH:	10 mg/m ³ TWA nonfibrous, inhalable particulate matter, particulate matter containing no asbestos and <1% crystalline silica ; 3 mg/m ³ TWA nonfibrous, respirable particulate matter, particulate matter containing no asbestos and <1% crystalline silica ; 0.1 fiber/cm ³ TWA (as determined by the membrane filter method at 400-450X magnification (4-mm objective), using phase-contrast illumination) respirable fibers, including whiskers, length >5 μm, aspect ratio ≥3:1

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)

There are no biological limit values for any of this product's components.

Appropriate engineering controls

Provide local exhaust or process enclosure ventilation system. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eye/face protection

When contacted directly to the applicable substance or with possible exposure, ensure to wear the required protective goggle/face shield certified by the Korea Occupational Safety and Health Agency (KOSHA).
Install eyewash and emergency shower facility near the work area.

Skin and Body Protection

When contacted directly to the applicable substance or with possible exposure, ensure to wear the required protective clothing certified by the Korea Occupational Safety and Health Agency (KOSHA).

Hand protection

When contacted directly to the applicable substance or with possible exposure, ensure to wear the required safety gloves certified by the Korea Occupational Safety and Health Agency (KOSHA).

Protective Materials

No data available.

Respiratory Protection

SCBA with full face piece should be available in case of emergency.

Further information

No data available.

SECTION 9: Physical and chemical properties

Appearance	greenish-gray to silver solid
Physical State	solid
Physical Form	solid
Color	greenish-gray to silver
Odor	odorless
Odor Threshold	Not available
pH	Not available

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Melting Point	Not available
Freezing point	Not available
Boiling Point	Not applicable
Boiling Point Range	Not available
Flash Point	(Not flammable)
Evaporation Rate	Not available
Flammability (solid, gas)	Not flammable
Upper Explosive Limit	Not available
Lower Explosive Limit	Not available
Vapor Pressure	Not available
Solubility (Other)	Not available
Water Solubility	(Insoluble)
Vapor Density (air=1)	Not available
Specific Gravity (water=1)	Not available
Partition coefficient: n-octanol/water	Not Determined
Autoignition Temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Molecular Weight	Not available
Density	2.3 - 2.8 g/cc
Sublimation	3650 °C

SECTION 10: Stability and reactivity

Reactivity

No reactivity hazard is expected.

Chemical stability

Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions

Will not polymerize.

Conditions to avoid

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Avoid accumulation of airborne dusts. Avoid contact with incompatible materials.

Materials to Avoid (Incompatibilities)

oxidizing materials

Hazardous Decomposition Products

Thermal decomposition products

oxides of carbon, oxides of silicon

SECTION 11: Toxicological information
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Information on Likely Routes of Exposure

Inhalation

No information on significant adverse effects.

Skin

No information on significant adverse effects.

Eye

No information on significant adverse effects.

Ingestion

No information on significant adverse effects.

Health Hazards

Acute and Chronic Toxicity

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and no selected endpoints have been identified.

Acute Toxicity Estimate

No data available.

Immediate Effects

No information on significant adverse effects.

Delayed Effects

No information on significant adverse effects.

Skin corrosive/irritant

No data available.

Serious eye damage/irritation

No data available.

Respiratory Sensitization

No data available.

Dermal Sensitization

No data available.

Carcinogenicity

Not applicable based on available data.

Component Carcinogenicity

Silicon carbide	409-21-2
Korea:	1B - Presumed Human Carcinogen based on demonstrated animal carcinogenicity (limited to fibrous materials)

Mutagenic Data

Not applicable based on available data.

Reproductive Effects Data

Not applicable based on available data.

Specific Target Organ Toxicity - Single Exposure

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No data available.

Specific Target Organ Toxicity - Repeated Exposure

No data available.

Aspiration hazard

No data available.

Medical Conditions Aggravated by Exposure

No data available.

SECTION 12: Ecological information**Ecotoxicity****Component Analysis - Aquatic Toxicity**

No LOLI ecotoxicity data are available for this product's components.

Persistence and degradability

No data available for the mixture.

Bioaccumulative Potential

No data available for the mixture.

Mobility in soil

No data available for the mixture.

Other adverse effects

None

SECTION 13: Disposal considerations**Disposal Methods**

Dispose in accordance with all applicable regulations.

Disposal Precaution

Dispose in accordance with all applicable regulations.

SECTION 14: Transport information**IATA Information:**

UN#: Not regulated

ICAO Information:

UN#: Not regulated

IMDG Information:

UN#: Not regulated

International Bulk Chemical Code

This material does not contain any chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

Special precautions

None

SECTION 15: Regulatory information**Korea Regulations****Industrial Safety and Health Act**

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Graphite	7782-42-5
Harmful Agents Subject to Work Environment Monitoring (Measurement Cycle: 6 months):	
Dust:	Present
Occupational exposure limit values:	
TWA.	2 mg/m ³ TWA (synthetic, except graphite fibers) respirable fraction Serial No. 716
Silicon carbide	409-21-2
Occupational exposure limit values:	
TWA.	10 mg/m ³ TWA (limited to fibrous materials) Serial No. 344
Carcinogen	1B - Presumed Human Carcinogen based on demonstrated animal carcinogenicity (limited to fibrous materials) Serial No. 344

Chemicals Control Act (CCA)

None of the substances are regulated under the Chemicals Control Act.

Dangerous Materials Safety Control Act

This product is not regulated under the Dangerous Materials Safety Control Act.

Waste Management Act

Designated Waste

Other requirements in domestic and other countries

No data available.

Component Analysis - Inventory

Graphite (7782-42-5)

US	CA	EU	AU	PH	JP - ENC S	JP - ISH L	KR KECI - Anne x 1	KR KECI - Anne x 2	KR - REAC H CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	Yes	Yes	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes

Silicon carbide (409-21-2)

US	CA	EU	AU	PH	JP - ENC S	JP - ISH L	KR KECI -	KR KECI -	KR - REAC H CCA	CN	NZ	MX	TW	VN (Draft)
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							Anne x 1	Anne x 2						
Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes

SECTION 16: Other information

NFPA Ratings

Health: 0 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Information sources and references

No data available.

Summary of Changes

11/29/2017 - Update to Section(s) 3. Section 3 update: Replaced CAS #7440-44-0 with CAS #7782-42-5.

Preparation Date

04/25/2016

Revision date

11/29/2017

Issue Date

11/29/2017

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA - California/Massachusetts/Minnesota/New Jersey/Pennsylvania*; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CFR - Code of Federal Regulations (US); CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC - European Commission; EEC - European Economic Community; EIN - European Inventory of (Existing Commercial Chemical Substances); EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; F - Background (for Venezuela Biological Exposure Indices); IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; ISHL - Japan Industrial Safety and Health Law; IUCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol/water partition coefficient; KR KECI Annex 1 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR KECI Annex 2 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL) , KR - Korea; LD50/LC50 - Lethal Dose/ Lethal Concentration; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX - Mexico; Ne - Non-specific; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; quantitative; NJTSR - New Jersey Trade Secret Registry; Nq - Non-quantitative; NSL - Non-Domestic Substance List (Canada); NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PEL - Permissible Exposure Limit; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH - Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and

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Reauthorization Act; Sc - Semi-quantitative; STEL - Short-term Exposure Limit; TCCA – Korea Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act; TW – Taiwan; TWA - Time Weighted Average; UEL - Upper Explosive Limit; UN/NA - United Nations /North American; US - United States; VLE - Exposure Limit Value (Mexico); VN (Draft) - Vietnam (Draft); WHMIS - Workplace Hazardous Materials Information System (Canada).

Other Information

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