



Safety Data Sheet

Material Name: Poco Graphite Synthetic Graphite - Copper Impregnated - Semiconductor Grade

SDS ID: 0140 (KOREA)

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product Identifier

Material Name

Poco Graphite Synthetic Graphite - Copper Impregnated - Semiconductor Grade

Product Description

This SDS covers the following Semiconductor Grades: DFP1C

Product Use

semiconductor manufacture

Restrictions on Use

None known.

Supplier Information

한국 인테그리스 주식회사 (Hanguk Entegris Co., Ltd.)

경기도 수원시 영통구 광교로 109 한국나노기술원 13층
우편번호 16229

전화번호: +82-31-8065-8300

팩스: +82-31-8065-8301

캠트렉 한국내 무료전화: 080-880-0468

캠트렉 국제: 1-703-527-3887

긴급전화 : 031-8036-9806

E-mail: Product.stewardship@entegris.com

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



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P501 Dispose of contents/container in accordance with local/regional/national/international regulations (depending on the information set out in the Waste Control Act).

Potential Environmental Effects

Very toxic to aquatic life with long lasting effects.

Other Hazards Which Do Not Result in Classification

When processed by milling, grinding, welding, melting, sawing, brazing, burning or other similar processes the generated dust, fines, fume or mist may pose a hazard through inhalation, ingestion or by eye or skin contact. May form combustible dust concentrations in air (during handling or processing). Small chips and dust generated by processes may be environmentally hazardous and toxic to aquatic life. SECTION 16: Other information.

SECTION 3: Composition / information on ingredients

CAS	Chemical name	Other Names	Percent
7782-42-5	Graphite	C	45-55
7440-50-8	Copper	Cu	45-55

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

Harmful if swallowed, respiratory tract irritation

Symptoms: Delayed

No information on significant adverse effects.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically and supportively.



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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. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion 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. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. Avoid inhalation of material or combustion by-products. Dike for later disposal.

Combustion

oxides of carbon, oxides of copper

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. Collect spillage.

Methods for Containment

Do not touch or walk through spilled material. Stop leak if possible without personal risk. 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.



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SECTION 7: Handling and storage

Precautions for safe handling

Avoid breathing dust. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid significant deposits of material, especially on horizontal surfaces, which may become airborne and form combustible dust clouds and may contribute to secondary explosions.

Conditions for safe storage, including any incompatibilities

None needed according to classification criteria.

Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances. 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. Dust or powder from machining process should be kept in closed container.

Incompatible Materials

acids, 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
Copper	7440-50-8
Korea:	2 mg/m ³ STEL as Cu dust and mist
	1 mg/m ³ TWA as Cu dust and mist ; 0.1 mg/m ³ TWA as Cu fume
ACGIH:	0.2 mg/m ³ TWA fume

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.



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Skin and Body Protection

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

Protective Materials

Not applicable.

Respiratory Protection

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

Further information

Not applicable.

SECTION 9: Physical and chemical properties

Appearance	gray to black solid block
Physical State	solid
Physical Form	solid block
Color	gray to black
Odor	odorless
Odor Threshold	Not available
pH	Not available
Melting Point	1083 °C (Copper)
Freezing point	Not available
Boiling Point	Not available
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



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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 available
Autoignition Temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Molecular Weight	Not available
Density	2.8 - 3.5 g/cc
Sublimation	3648.9 °C (graphite)

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

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

Materials to Avoid (Incompatibilities)

acids, oxidizing materials

Hazardous Decomposition Products

Thermal decomposition products

oxides of carbon, oxides of copper

SECTION 11: Toxicological information

Information on Likely Routes of Exposure

Inhalation

irritation

Skin

No information on significant adverse effects.



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Eye

No information on significant adverse effects.

Ingestion

Harmful if swallowed.

Health Hazards

Acute and Chronic Toxicity

Component Analysis - LD50/LC50

The components of this material have been reviewed in various sources and the following selected endpoints are published:

Graphite (7782-42-5)

Inhalation LC50 Rat >2000 mg/m³ 4 h (no deaths occurred)

Copper (7440-50-8)

Inhalation LC50 Rat >5.11 mg/L 4 h

Acute Toxicity Estimate

No data available.

Immediate Effects

Harmful if swallowed, respiratory tract irritation

Delayed Effects

No information on significant adverse effects.

Skin corrosive/irritant

No information on significant adverse effects.

Serious eye damage/irritation

No information on significant adverse effects.

Respiratory Sensitization

No data available.

Dermal Sensitization

No data available.

Carcinogenicity

Not applicable based on available data.

Component Carcinogenicity

Graphite	7782-42-5
DFG:	Category 4 (no significant contribution to human cancer ;except ultrafine particles ;inhalable fraction)

Mutagenic Data

Not applicable based on available data.

Reproductive Effects Data

Not applicable based on available data.

Specific Target Organ Toxicity - Single Exposure

respiratory system

Specific Target Organ Toxicity - Repeated Exposure

No target organs identified.

Aspiration hazard

No data available.

Medical Conditions Aggravated by Exposure



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respiratory disorders

Additional Data

No data available.

SECTION 12: Ecological information

Ecotoxicity

Very toxic to aquatic life with long lasting effects.

Component Analysis - Aquatic Toxicity

Graphite	7782-42-5
Fish:	LC50 96 h Danio rerio >100 mg/L [semi-static]
Copper	7440-50-8
Fish:	LC50 96 h Pimephales promelas 0.0068 - 0.0156 mg/L; LC50 96 h Pimephales promelas <0.3 mg/L [static]; LC50 96 h Pimephales promelas 0.2 mg/L [flow-through]; LC50 96 h Oncorhynchus mykiss 0.052 mg/L [flow-through]; LC50 96 h Lepomis macrochirus 1.25 mg/L [static]; LC50 96 h Cyprinus carpio 0.3 mg/L [semi-static]; LC50 96 h Cyprinus carpio 0.8 mg/L [static]; LC50 96 h Poecilia reticulata 0.112 mg/L [flow-through]
Algae:	EC50 72 h Pseudokirchneriella subcapitata 0.0426 - 0.0535 mg/L [static] EPA ; EC50 96 h Pseudokirchneriella subcapitata 0.031 - 0.054 mg/L [static] EPA
Invertebrate:	EC50 48 h Daphnia magna 0.03 mg/L [Static] EPA

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

No data available.

SECTION 13: Disposal considerations

Disposal Methods

Dispose in accordance with Waste Control Act.

Disposal Precaution

Dispose in accordance with the contents specified in the Designated Waste Designation and Regulations.

SECTION 14: Transport information

IATA Information:

UN#: Not regulated



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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**

Graphite	7782-42-5
Harmful Agents Subject to Work Environment Monitoring (Measurement Cycle: 6 months):	
Dust:	Present (Measurement cycle: 6 months)
Occupational exposure limit values:	
TWA.	2 mg/m3 TWA (synthetic, except graphite fibers) respirable fraction Serial No. 716
Copper	7440-50-8
Hazardous Substances Subject to Control:	
Metals:	>=1 % mixture Serial No. 001
Harmful Agents Subject to Work Environment Monitoring (Measurement Cycle: 6 months):	
Metals:	>=1 % mixture
Harmful Agents Subject to Workers Requiring Health Examination (Diagnostic cycle : 12 Months):	
Metals:	>=1 % mixture (dusts, fume, mists, Diagnostic cycle: 12 months)
Occupational exposure limit values:	



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TWA.	1 mg/m ³ TWA as Cu dust and mist Serial No. 010 ; 0.1 mg/m ³ TWA as Cu fume Serial No. 011
STEL	2 mg/m ³ STEL as Cu dust and mist Serial No. 011

Not applicable to the substance subject to PSM.

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.

Product Classification

Not applicable

Waste Management Act

Designated Waste

Other requirements in domestic and other countries

No data available.

Component Analysis - Inventory

Graphite (7782-42-5)

US	CA	AU	CN	EU	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2
Yes	DSL	Yes	Yes	EIN	No	No	Yes	No

KR - REACH CCA	MX	NZ	PH	TH-TECI	TW, CN	VN (Draft)
No	Yes	Yes	Yes	Yes	Yes	Yes

Copper (7440-50-8)

US	CA	AU	CN	EU	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2
Yes	DSL	Yes	Yes	EIN	Yes	No	Yes	No

KR - REACH CCA	MX	NZ	PH	TH-TECI	TW, CN	VN (Draft)
No	Yes	Yes	Yes	No	Yes	Yes

SECTION 16: Other information

NFPA Ratings

Health: 2 Fire: 0 Instability: 0

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

Information sources and references

No data available.



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Summary of Changes

12/6/2021 - Update to Section(s) 3, 4, 7, 11, 13, 16.

Preparation Date

04/11/2016

Revision date

12/6/2021

Issue Date

12/6/2021

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; KR REACH CCA - Korea Registration and Evaluation of Chemical Substances Chemical Control Act; 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; 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 Reauthorization Act; Sc - Semi-quantitative; STEL - Short-term Exposure Limit; TCCA - Korea Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TH-TECI - Thailand - FDA Existing Chemicals Inventory (TECI); 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

Disclaimer:



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When processed by milling, grinding, welding, melting, sawing, brazing, burning or other similar processes the generated dust, fines, fume or mist may pose a hazard through inhalation, ingestion or by eye or skin contact. Combustible Dust; Acute Toxicity - Oral Category 4; Specific Target Organ Toxicity - Single Exposure Category 3: respiratory system; Hazardous to the Aquatic Environment - Acute Category 1; Hazardous to the Aquatic Environment - Chronic Category 1.