



Safety Data Sheet

Material Name: Poco Graphite Synthetic Graphite - Copper Impregnated -
Semiconductor Grade; Poco Graphite 合成石墨 - 銅浸漬 - 半導體級

SDS ID: 0140 (TAIWAN)

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

Product identifier

Chemical name:

Poco Graphite Synthetic Graphite - Copper Impregnated - Semiconductor Grade; Poco Graphite 合成石墨 - 銅浸漬
- 半導體級

Product Description:

This SDS covers the following Semiconductor Grades: DFP1C

Recommended Use:

semiconductor manufacture

Restrictions on Use:

None known.

Details of the supplier of the safety data sheet

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SECTION 2: Hazards identification

Chemical Hazard(s) Classification:

None needed according to classification criteria.

Label content:

Hazard symbols

None needed according to classification criteria.

Signal word

None needed according to classification criteria

Hazard statements



Safety Data Sheet

Material Name: Poco Graphite Synthetic Graphite - Copper Impregnated - Semiconductor Grade; Poco Graphite 合成石墨 - 銅浸漬 - 半導體級

SDS ID: 0140 (TAIWAN)

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.

Other hazards:

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

Component Name	CAS	Hazardous ingredients (% of the content)
Graphite	7782-42-5	40-60
Copper	7440-50-8	40-60

Impurities and stabilizing additives contributing to the GHS Classification

None

SECTION 4: First aid measures

Description of Necessary Measures

Inhalation:

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

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.

Ingestion:

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth.

Most Important Symptoms/Effects

Symptoms: Immediate:



Safety Data Sheet

Material Name: Poco Graphite Synthetic Graphite - Copper Impregnated - Semiconductor Grade; Poco Graphite 合成石墨 - 銅浸漬 - 半導體級

SDS ID: 0140 (TAIWAN)

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Symptoms: Delayed:

allergic reactions, mutagenic effects, cancer

Protection of first-aiders

Wear suitable protective clothing. Perform first aid measures in a safe area.

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. 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.

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.

Protective Equipment and Precautions for Firefighters:

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

Hazardous combustion products:

oxides of carbon, oxides of copper

SECTION 6: Accidental release measures

Personal precautions:

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



Safety Data Sheet

Material Name: Poco Graphite Synthetic Graphite - Copper Impregnated - Semiconductor Grade; Poco Graphite 合成石墨 - 銅浸漬 - 半導體級

SDS ID: 0140 (TAIWAN)

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

Precautions for safe handling:

Do not breathe dust. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product. Wear protective gloves/clothing and eye/face protection. Contaminated work clothing must not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. 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
ACGIH:	2 mg/m ³ TWA (all forms except graphite fibers) respirable particulate matter
Copper	7440-50-8
Taiwan:	0.2 mg/m ³ TWA fume ; 1 mg/m ³ TWA dust and mist
	0.6 mg/m ³ STEL fume ; 2 mg/m ³ STEL dust and mist
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.



Safety Data Sheet

Material Name: Poco Graphite Synthetic Graphite - Copper Impregnated - Semiconductor Grade; Poco Graphite 合成石墨 - 銅浸漬 - 半導體級

SDS ID: 0140 (TAIWAN)

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection:

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

Hand protection:

Wear appropriate chemical resistant gloves.

Eye/face protection:

Wear safety glasses. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection:

Wear appropriate chemical resistant clothing.

Hygiene Measures:

Use in accordance with good industrial hygiene practices.

SECTION 9: Physical and chemical properties

Appearance	gray to black solid block	Physical State	solid
Odor	odorless	Color	gray to black
Odor Threshold	Not available	pH	Not available
Melting Point	1083 °C (Copper)	Boiling Point	Not available
Boiling Point Range	Not available	Freezing point	Not available
Evaporation Rate	Not available	Flammability (solid, gas)	Not flammable
Autoignition Temperature	Not available	Flash Point	(Not flammable)
Lower Explosive Limit	Not available	Decomposition temperature	Not available
Upper Explosive Limit	Not available	Vapor Pressure	Not available
Vapor Density (air=1)	Not available	Specific Gravity (water=1)	Not available
Water Solubility	(Insoluble)	Partition coefficient: n-octanol/water	Not available
Viscosity	Not available	Kinematic viscosity	Not available
Solubility (Other)	Not available	Density	2.8 - 3.5 g/cc
Physical Form	solid block	Sublimation	3648.9 °C (graphite)



Safety Data Sheet

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Semiconductor Grade; Poco Graphite 合成石墨 - 銅浸漬 - 半導體級

SDS ID: 0140 (TAIWAN)

Molecular Weight Not available

SECTION 10: Stability and reactivity

Stability:

Stable at normal temperatures and pressure.

Possible hazardous reactions under specific conditions:

No reactivity hazard is expected.

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, skin, eyes

Inhalation:

May be harmful if inhaled, irritation, digestive system damage, immune system damage

Ingestion:

Fatal if swallowed, kidney damage, digestive tract damage

Skin Contact:

allergic reactions

Eye Contact:

irritation

Immediate Effects:

Fatal if swallowed, May be harmful if inhaled, respiratory tract irritation, eye irritation, allergic reactions, digestive tract damage, immune system damage, kidney damage

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.

Delayed Effects:

allergic reactions, mutagenic effects, cancer

Irritation/Corrosivity Data:

respiratory tract irritation, eye irritation



Safety Data Sheet

Material Name: Poco Graphite Synthetic Graphite - Copper Impregnated - Semiconductor Grade; Poco Graphite 合成石墨 - 銅浸漬 - 半導體級

SDS ID: 0140 (TAIWAN)

Respiratory Sensitization:

No data available.

Dermal Sensitization:

Component data indicate the substance is sensitizing.

Carcinogenicity:

Component Carcinogenicity

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

May cause cancer.

Mutagenic Data:

Available data characterizes this mixture as mutagenic.

Reproductive Effects Data:

No data available for the mixture.

Tumorigenic Data:

No data available for the mixture.

Specific Target Organ Toxicity - Single Exposure:

respiratory system, digestive system, immune system, kidneys

Specific Target Organ Toxicity - Repeated Exposure

No target organs identified.

Aspiration hazard:

No data available.

Medical Conditions Aggravated by Exposure:

kidney disorders, respiratory disorders, skin disorders and allergies, digestive disorders, immune system disorders

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]



Safety Data Sheet

Material Name: Poco Graphite Synthetic Graphite - Copper Impregnated -
Semiconductor Grade; Poco Graphite 合成石墨 - 銅浸漬 - 半導體級

SDS ID: 0140 (TAIWAN)

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 Environmental Media:

No data available for the mixture.

Other Ecological Information:

No data available.

SECTION 13: Disposal considerations

Disposal Methods:

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

Taiwan Regulations

Toxic and Concerned Chemical Substances Control Act

No component(s) of this product are identified in the Toxic and Concerned Chemical Substances Control Act.

Surface Water Body Classification and Water Quality Standards

The following component(s) of this material are listed:

Copper	7440-50-8
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Safety Data Sheet

Material Name: Poco Graphite Synthetic Graphite - Copper Impregnated - Semiconductor Grade; Poco Graphite 合成石墨 - 銅浸漬 - 半導體級

SDS ID: 0140 (TAIWAN)

	0.03 mg/l MAV
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Effluent Discharge Standards

The following component(s) are listed on the Effluent Discharge Standards.

Copper	7440-50-8
	1.5 mg/l MEL (completed the construction work, undergoing construction or have completed the project bidding before December 25, 2017, and with approved wastewater discharge at >500 m3/day will be implemented since January 1, 2021 have not completed the project bidding before December 25, 2017); 3 mg/l MEL (completed the construction work, undergoing construction or have completed the project bidding before December 25, 2017)

Waste Disposal Act - TCLP Leaching Standards

No component(s) of this product are identified in the Waste Disposal Act.

Agro-pesticide Management Act

None of this product's components are on the list.

Hazard Prevention Standard for Specified Chemical Substances

No component(s) of this product are identified in the Hazard Prevention Standard for Specified Chemical Substances.

Ozone Depleting Substances

No component(s) of this product are identified on the Ozone Depleting Substances list.

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



Safety Data Sheet

Material Name: Poco Graphite Synthetic Graphite - Copper Impregnated - Semiconductor Grade; Poco Graphite 合成石墨 - 銅浸漬 - 半導體級

SDS ID: 0140 (TAIWAN)

NFPA Ratings

Health: 3 Fire: 0 Instability: 0

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

Summary of Changes:

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

Key literature references and sources for data:

Available upon request.

Organization that prepared SDS:

Entegris

Preparation Date:

4/5/2016

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12/6/2021

Person who prepared SDS:

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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);



Safety Data Sheet

**Material Name: Poco Graphite Synthetic Graphite - Copper Impregnated -
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SDS ID: 0140 (TAIWAN)

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 2; Acute Toxicity - Inhalation Category 5; Serious Eye Damage/Eye Irritation Category 2A; Skin Sensitization Category 1; Germ Cell Mutagenicity Category 1; Carcinogenicity 1A; Specific Target Organ Toxicity - Single Exposure Category 1: digestive tract; Specific Target Organ Toxicity - Single Exposure Category 2: immune system, kidneys; 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.