

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier****Material Name**

Poco Graphite Synthetic Graphite - Semiconductor Grade

Product Description

This SDS covers the following Semiconductor Grades: ZEE, SFG, DFP, TRA, HPD, CZR, SCF, PLS, FM.

Substance name:	Graphite
CAS Number:	7782-42-5
EC Number:	231-955-3
Substance Registration Number(s):	01-2119486977-12-0051

Registration status

If this product is subject to REACH, then Registration numbers will be found in Section 3 and further information in Section 15.

1.2 Relevant identified uses of the substance or mixture and uses advised against**Identified uses**

semiconductor manufacture

Uses advised against

None known.

1.3 Details of the supplier of the safety data sheetEntegris GmbH
Hugo-Junkers-Ring 5, Gebäude 107/W, 01109 Dresden, Germany

Telephone Number: +49 (0) 351 795 97 0

Fax Number: +49 (0) 351 795 97 499

Only RepresentativeTetra Tech International, Inc.
Fuchsstrasse 1, 67688 Rodenbach, Germany
reach@tetratech.comEntegris, Inc.
129 Concord Road
Building 2
Billerica, MA 01821
USA

Telephone Number: +1-952-556-4181

Telephone Number: +1-800-394-4083 (toll free within North America)

E-mail: Product.stewardship@entegris.com

1.4 Emergency telephone number

+1-703-527-3887 - (24 hours) CHEMTREC – International

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture**

Classification according to Regulation (EC) No 1272/2008 [CLP]

None needed according to classification criteria.

2.2 Label elements

Labeling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard symbols

None needed according to classification criteria.

Signal word

None needed according to classification criteria

Hazard statements

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.

2.3 Other hazards

When processed by milling, grinding, sawing, 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).

SECTION 3: Composition / information on ingredients

3.1 SUBSTANCES

CAS EC No Registration No	Component Name Synonyms	1272/2008 (CLP)	Percent
7782-42-5 231-955-3 01-2119486977-12-0051	Graphite	--	>99

SECTION 4: First aid measures

4.1 Description of first aid measures

Inhalation

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

Skin

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.

Eyes

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, get medical attention.

4.2 Most Important Symptoms/Effects

Acute

No information on significant adverse effects.

Delayed

No information on significant adverse effects.

4.3 Indication of Immediate Medical Attention and Special Treatment

Treat symptomatically and supportively.

SECTION 5: Firefighting measures**5.1 Extinguishing media****Suitable extinguishing media**

Use extinguishing agents appropriate for surrounding fire.

Unsuitable Extinguishing Media

None known.

5.2 Special hazards arising from the substance or mixture

Negligible fire hazard.

Combustion

oxides of carbon

5.3 Advice for firefighters

Negligible fire 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. 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.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

Wear personal protective clothing and equipment. Avoid release to the environment. 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.

6.2 Environmental precautions

Avoid release to the environment.

6.3 Methods and Materials for Containment and Cleaning Up

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.

6.4 Reference to other sections

Safe handling: see section 7. Personal protection equipment (PPE): see section 8. Disposal: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

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

7.2 Conditions for safe storage, including any incompatibilities

None needed according to classification criteria.

Store and handle in accordance with all current regulations and standards. Store in a well-ventilated area.

Keep container tightly closed. 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

oxidizing materials

7.3 Specific end use(s)

semiconductor manufacture

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Component Exposure Limits

Graphite	7782-42-5
ACGIH:	2 mg/m ³ TWA (all forms except graphite fibers) respirable particulate matter
Austria:	5 mg/m ³ TWA [TMW] alveolar dust with <1% quartz, respirable fraction
	10 mg/m ³ STEL [KZW] alveolar dust with <1% quartz, respirable fraction 2 X 60 min
Belgium:	2 mg/m ³ TWA (except fibers) alveolar fraction
Bulgaria	5 mg/m ³ TWA inhalable fraction
Croatia	4 mg/m ³ TWA [GVI] respirable dust ; 10 mg/m ³ TWA [GVI] total dust
Czech Republic	2 mg/m ³ TWA as respirable fraction, <=5% Silica, Cristobalite, Tridymite and .gamma.-Aluminium oxide dust
Estonia	5 mg/m ³ TWA dust
Finland:	2 mg/m ³ TWA
France:	2 mg/m ³ TWA [VME] alveolar fraction
Germany (DFG):	1.5 mg/m ³ TWA MAK respirable fraction ; 4 mg/m ³ TWA MAK inhalable fraction
Greece:	10 mg/m ³ TWA inhalable fraction ; 5 mg/m ³ TWA respirable fraction
Ireland:	10 mg/m ³ TWA total inhalable dust ; 4 mg/m ³ TWA respirable dust
	30 mg/m ³ STEL (calculated) total inhalable dust ; 12 mg/m ³ STEL (calculated) respirable dust

Italy:	2 mg/m3 TWA (all forms except Graphite fibers) respirable fraction
Latvia	2 mg/m3 TWA
Lithuania	5 mg/m3 TWA [IPRD] dust
Poland	6 mg/m3 TWA [NDS] (synthetic) inhalable fraction
Portugal:	2 mg/m3 TWA [VLE-MP] (all forms except Graphite fibers) respirable fraction
Romania	2 mg/m3 TWA (Quartz <=5%) dust, respirable fraction
Slovak Republic	2 mg/m3 TWA respirable fraction, 5% or less fibrogenic component ; 10 mg/m3 TWA respirable fraction, greater than 5% fibrogenic component ; 10 mg/m3 TWA total aerosol
Spain:	2 mg/m3 TWA [VLA-ED] (see UNE EN 481:1995 on workplace atmospheres. Definition of fractions by particle size for aerosol measurement) dust; respirable fraction
Sweden:	5 mg/m3 TLV total dust
United Kingdom:	10 mg/m3 TWA inhalable dust ; 4 mg/m3 TWA respirable dust
	30 mg/m3 STEL (calculated) inhalable dust ; 12 mg/m3 STEL (calculated) respirable dust

Component Biological Exposure Limits

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

Derived No Effect Levels (DNELs)

No DNELs available.

Predicted No Effect Concentrations (PNECs)

No PNECs available.

8.2 Exposure Controls

Engineering controls

Provide local exhaust 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.

Eye/face protection

Wear safety glasses (EN 166).

Skin Protection

Wear appropriate chemical resistant clothing (EN ISO 6529).

Respiratory Protection

SCBA with full face piece should be available in case of emergency (EN 137).

Glove Recommendations

Wear appropriate chemical resistant gloves (EN 374).

Environmental exposure controls

Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	gray to black solid	Physical State	solid
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Odor	odorless	Color	gray to black
Odor Threshold	Not available	pH	Not available
Melting Point	Not available	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	1.4 - 2 g/cc
Physical Form	solid block	Sublimation	3650 °C
Molecular Formula	C	Molecular Weight	12.01
Oxidising properties	Not available	Explosive properties	Not available

9.2 Other information

No additional information available for the product.

SECTION 10: Stability and reactivity

10.1 Reactivity

No reactivity hazard is expected.

10.2 Chemical stability

Stable at normal temperatures and pressure.

10.3 Possibility of hazardous reactions

Will not polymerize.

10.4 Conditions to avoid

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

10.5 Incompatible materials

oxidizing materials

10.6 Hazardous decomposition products

Thermal decomposition products

oxides of carbon

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Component Analysis - LD50/LC50

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

Product Toxicity Data**Acute Toxicity Estimate**

No data available.

Irritation/Corrosivity Data

No data available.

Respiratory Sensitization

No data available.

Dermal Sensitization

No data available.

Germ Cell Mutagenicity

No data available.

Tumorigenic Data

No data available.

Component Carcinogenicity

None of this product's components are listed by IARC or DFG.

Toxicity for reproduction

No data available.

Specific Target Organ Toxicity - Single Exposure

No data available.

Specific Target Organ Toxicity - Repeated Exposure

No data available.

Aspiration hazard

No data available.

Additional Data

No data available.

SECTION 12: Ecological information**12.1 Toxicity****Component Analysis - Aquatic Toxicity**

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

12.2 Persistence and degradability

No data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

No data available.

12.6 Other adverse effects

No data available.

SECTION 13: Disposal considerations**13.1 Waste treatment methods**

Waste disposal according to directive 2008/98/EC, covering waste and dangerous waste.

Waste codes/waste designations according to LoW. EWC-code: 16 03 04.

Since emptied containers retain material residue, follow safe handling/label warnings even after container is emptied.

Release to the environment or sewage system is prohibited.

Dispose in accordance with all applicable federal, state/regional and local laws and regulations.

SECTION 14: Transport information

		ADR	RID	ICAO	IATA	ADN	IMDG
14.1	UN Number	Not regulated	Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
14.2	UN Proper Shipping Name	--	--	--	--	--	--
14.3	Transport Hazard Class(es)	--	--	--	--	--	--
14.4	Packing Group	--	--	--	--	--	--
14.5	Environmental Hazards	--	--	--	--	--	--
14.6	Special Precautions For User	--	--	--	--	--	--
14.7	Transport in Bulk According to Annex II of MARPOL and the IBC Code	--	--	--	--	--	--
14.8	Further information	--	--	--	--	--	--

International Bulk Chemical Code

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

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU - REACH (1907/2006) - Annex XIV List of Substances Subject to Authorization

No components of this material are listed.

EU - REACH (1907/2006) - Article 59(1) Candidate List of Substances Subject to Authorization

No components of this material are listed.

EU - REACH (1907/2006) - Annex XVII Restrictions of Certain Dangerous Substances, Mixtures and Articles

No components of this material are listed.

EU - Substances Depleting the Ozone layer (1005/2009)

No components of this material are listed.

EU - Persistent Organic Pollutants (850/2004)

No components of this material are listed.

EU - Export and Import Restrictions (689/2008) - Chemicals and Articles Subject to Export Ban

No components of this material are listed.

EU - Seveso III Directive (2012/18/EU) - Qualifying Quantities of Dangerous Substances

No components of this material are listed.

EU - Plant Protection Products (1107/2009/EC)

No components of this material are listed.

EU - Biocides (528/2012/EU)

No components of this material are listed.

EU - Water Framework Directive (2000/60/EC)

No components of this material are listed.

EU - Limitation of Emissions of Volatile Organic Compounds Due to the Use of Organic Solvents in Certain Activities and Installations (1999/13/EC)

No components of this material are listed.

EU - Detergent Regulation (648/2004/EC)

No components of this material are listed.

Germany Regulations

Germany Water Classification - Product

non-hazardous to water (nwg)

Germany Water Classification - Component

Graphite (7782-42-5)

ID Number 801 , not considered hazardous to water

Denmark Regulations

No components of this material are listed.

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	M X	T W	VN (Draft)
Yes	DSL	EIN	Yes	Yes	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes

15.2 Chemical Safety Assessment

A Chemical Safety Assessment for this substance is available upon request.

SECTION 16: Other information

16.1 Indication of changes

20/2/2018 - Update to Section(s) 1, 15. 6/11/2017 : Section 3 update: Replaced CAS #7440-44-0 with CAS #7782-42-5.

Preparation Date

15/03/2016

Revision date

6/11/2017

16.2 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; 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; 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)

16.3 Key literature references and sources for data

Available upon request.

16.4 Methods Used for Classification of Mixture According to Regulation (EC) No 1272/2008

Available upon request.

16.5 Relevant H- and EUH-phrases (Number and full text) and Notes

None needed according to classification criteria

16.6 Training advice

Read the Safety Data Sheet before handling product.

16.7 Further Information**Disclaimer:**

The information in this (Material) Safety Data Sheet ("(M)SDS") is believed to be current and accurate as of the time of shipment of the product by Entegris. Entegris makes no warranties, express or implied, with respect to such information, including, without limitation, the implied warranties of merchantability and fitness for a particular purpose. Entegris assumes no liability for any loss or injury which may result from the use of the information contained in this (M)SDS. The chemical, physical and toxicological properties of the Entegris product described in this (M)SDS have not been thoroughly investigated. Users are responsible for exercising due care in using the Entegris product, and for conducting their own investigation to determine whether the product is fit for their particular purpose and suitable for their method of use or application. It is the user's responsibility to ensure that its activities comply with all applicable laws and regulations. Entegris is a registered trademark of Entegris Inc. or an affiliated company. © 2015 Entegris Inc. or affiliated company. All rights reserved.