



Safety Data Sheet

Material Name Poco Graphite Synthetic Graphite - Nickel Impregnated, AXF-5QN

SDS ID: 0014P

Section 1 - IDENTIFICATION

Product Identifier: Poco Graphite Synthetic Graphite - Nickel Impregnated, AXF-5QN

Recommended Use

semiconductor manufacture

Restrictions on Use

None known.

Entegris, 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)

Emergency Telephone Number:
CHEMTREC - U.S. - 1-800-424-9300
CHEMTREC - Intl. - 1-703-527-3887

Email of Competent Person

Product.stewardship@entegris.com

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with 29 CFR 1910.1200

- Combustible dust
- Skin Corrosion / Irritation, Category 2
- Eye Damage / Irritation, Category 2A
- Respiratory sensitizer, Category 1
- Skin sensitizer, Category 1
- Germ Cell Mutagenicity, Category 2
- Carcinogenicity, Category 1A
- Toxic to Reproduction, Category 2
- Specific Target Organ Toxicity - Single Exposure, Category 1 (kidneys and respiratory system)
- Specific Target Organ Toxicity - Single Exposure, Category 2 (systemic toxicity)
- Specific Target Organ Toxicity - Repeated Exposure, Category 1 (respiratory system)
- Hazardous to the Aquatic Environment - Acute Hazard, Category 1 (59 % unknown)

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Hazardous to the Aquatic Environment - Chronic Hazard, Category 2 (59 % unknown)

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

DANGER

Hazard Statement(s)

May form combustible dust concentrations in air during processing activities (including but not limited to: cutting, sanding, drilling, machining, dust control equipment, other dust generating activities)

Causes skin irritation

Causes serious eye irritation

May cause allergy or asthma symptoms or breathing difficulties if inhaled

May cause an allergic skin reaction.

Suspected of causing genetic defects

May cause cancer

Suspected of damaging fertility or the unborn child

Causes damage to kidneys and respiratory system.

May cause damage to systemic toxicity.

Causes damage to respiratory system through prolonged or repeated exposure.

Very toxic to aquatic life

Toxic to aquatic life with long lasting effects

Precautionary Statement(s)

Prevention

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. Wear respiratory protection. Contaminated work clothing should not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid release to the environment.

Response

IF exposed or concerned: Get medical advice/attention. IF INHALED: If breathing is difficult, remove person to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician. IF ON SKIN: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. Collect spillage.

Storage

Store locked up.

Disposal

Dispose in accordance with all applicable regulations.

Hazard(s) Not Otherwise Classified

None known.

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Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component	Percent
7440-44-0	Graphite, Synthetic	40-60
7440-02-0	Nickel	40-50
7440-47-3	Chromium	1-10
7439-89-6	Iron	1-10
7440-21-3	Silicon	1-10

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Nickel inorganic compounds, Chromium compounds, Iron compounds.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

The chemical identity and/or percentage of composition is being withheld as a trade secret.

Section 4 - FIRST AID MEASURES

Description of Necessary Measures

Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. 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.

Most Important Symptoms/Effects

Acute

respiratory tract irritation, skin irritation, eye irritation, allergic reactions, kidney damage, respiratory system damage, systemic toxicity damage

Delayed

allergic reactions, mutagenic effects, cancer, reproductive effects, respiratory system damage

Indication of Immediate Medical Attention and Special Treatment

For inhalation, consider oxygen.

Section 5 - FIRE FIGHTING MEASURES

Suitable Extinguishing Media

Use extinguishing agents appropriate for surrounding fire.

Unsuitable Extinguishing Media

None known.

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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 spray until well after the fire is out. Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products. Dike for later disposal.

Special 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* * *

Personal Precautions, Protective Equipment and Emergency Procedures

Avoid release to the environment. Collect spillage. Minimize dust generation and accumulation. Keep unnecessary people away, isolate hazard area and deny entry. Provide adequate ventilation. Wear personal protective clothing and equipment. If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. 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. See also Section 8 for additional information on hygiene measures. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. See Section 13 for waste disposal information.

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. **Small spills:** Move containers away from spill to a safe area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. **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. See Section 1 for emergency contact information and Section 13 for waste disposal.

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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. Wear respiratory protection. Contaminated work clothing should not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid significant deposits of material, especially on horizontal surfaces, which may become airborne and form combustible dust clouds and may contribute to secondary explosions. Use only with 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. Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored, and processed. 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. Dust levels must be kept within prescribed limits. Spilled product should be cleaned up and a high standard of housekeeping maintained. Transfer product using proper grounding and bonding procedures to avoid static accumulation. See also Section 8 for additional information on hygiene measures. Users of this material should perform combustibility testing, prior to use, specific to their use conditions if dust is to be generated.

Conditions for Safe Storage, including any Incompatibilities

Store and handle in accordance with all current regulations and standards. Store locked up. Keep container tightly closed. Store in a well-ventilated place. Keep separated from incompatible substances. Maintain graphite blocks in stable position. Any machined 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.

Incompatibilities: acids, bases, combustible materials, halogens, metal carbide, metal salts, metals, oxidizing materials, peroxides, reducing agents

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Nickel (7440-02-0)

OSHA (final): 1 mg/m³ TWA
OSHA (vacated): 1 mg/m³ TWA
ACGIH: 1.5 mg/m³ TWA (inhalable fraction)
NIOSH: 0.015 mg/m³ TWA

Chromium (7440-47-3)

OSHA (final): 1 mg/m³ TWA
OSHA (vacated): 1 mg/m³ TWA
ACGIH: 0.5 mg/m³ TWA
NIOSH: 0.5 mg/m³ TWA
Europe: 2 mg/m³ TWA

Silicon (7440-21-3)

OSHA (final): 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)
OSHA (vacated): 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)
NIOSH: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable dust)

Component Biological Limit Values

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

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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.

Individual Protection Measures, such as Personal Protective Equipment

Eyes/Face Protection

Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin Protection

Wear appropriate chemical resistant clothing.

Glove Recommendations

Wear appropriate chemical resistant gloves.

Respiratory Protection

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

* * *Section 9 - PHYSICAL AND CHEMICAL PROPERTIES* * *

Physical State:	Solid	Appearance:	solid
Physical Form:	solid	Odor:	odorless
Odor Threshold:	Not available	pH:	Not available
Melting/Freezing Point:	1453 °C	Boiling Point:	Not available
Flash Point:	Not flammable	Decomposition Temp.:	Not available
Evaporation Rate:	Not available	LEL:	Not available
UEL:	Not available	Vapor Pressure:	Not available
Vapor Density (air = 1):	Not available	Density:	3.2 g/cc
Water Solubility:	Not available	Log Kow:	Not available
Auto Ignition Temp.:	Not available	Viscosity:	Not available
Sublimation Point:	3648.9 °C (Graphite)	Volatility:	Not available
Coefficient of Water/Oil Dist:	Not available	Flammability (solid, gas):	Not flammable

Other Property Information

No additional information is available.

* * *Section 10 - STABILITY AND REACTIVITY* * *

Reactivity

No reactivity hazard 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.

Incompatible Materials

acids, bases, combustible materials, halogens, metal carbide, metal salts, metals, oxidizing materials, peroxides, reducing agents

Decomposition Products

miscellaneous decomposition products

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Section 11 - TOXICOLOGICAL INFORMATION

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, Synthetic (7440-44-0)

Oral LD50 Rat >10000 mg/kg

Nickel (7440-02-0)

Oral LD50 Rat >9000 mg/kg

Iron (7439-89-6)

Oral LD50 Rat 984 mg/kg

Silicon (7440-21-3)

Oral LD50 Rat 3160 mg/kg

RTECS Acute Toxicity (selected)

The components of this material have been reviewed, and RTECS publishes the following endpoints:

Iron (7439-89-6)

Oral: 750 mg/kg Oral Rat LD50; 30 gm/kg Oral Rat LD50

Silicon (7440-21-3)

Oral: 3160 mg/kg Oral Rat LD50

Acute Toxicity Level

Iron (7439-89-6)

Non Toxic: ingestion

Silicon (7440-21-3)

Moderately Toxic: ingestion

Information on Likely Routes of Exposure

Inhalation

irritation, allergic reactions, respiratory system damage, cancer

Ingestion

gastrointestinal irritation

Skin Contact

irritation, allergic reactions

Eye Contact

irritation

Immediate Effects

respiratory tract irritation, skin irritation, eye irritation, allergic reactions, kidney damage, respiratory system damage, systemic toxicity damage

Delayed Effects

allergic reactions, mutagenic effects, cancer, reproductive effects, respiratory system damage

Medical Conditions Aggravated by Exposure

respiratory disorders, skin disorders and allergies

Irritation/Corrosivity Data

respiratory tract irritation, skin irritation, eye irritation

RTECS Irritation

The components of this material have been reviewed, and RTECS publishes the following endpoints:

Silicon (7440-21-3)

3 mg Eyes Rabbit mild

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Local Effects

Nickel (7440-02-0)

Irritant: inhalation, skin

Target Organs

Nickel (7440-02-0)

immune system (sensitizer)

Respiratory Sensitization

Component data indicate the substance is sensitizing.

Dermal Sensitization

Component data indicate the substance is sensitizing.

Carcinogenicity

Component Carcinogenicity

ACGIH, IARC, OSHA, NIOSH, and NTP carcinogen lists have been checked for selected similar materials or those components with CAS registry numbers. Only those components found on any of these lists will be shown below. A component not appearing was not found on any of the lists and is not considered to be a carcinogen by these sources.

Nickel (7440-02-0)

ACGIH: A5 - Not Suspected as a Human Carcinogen

IARC: Monograph 49 [1990]; Supplement 7 [1987] (Group 2B (possibly carcinogenic to humans))

NIOSH: potential occupational carcinogen

NTP: Reasonably Anticipated To Be A Human Carcinogen

Chromium (7440-47-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 49 [1990]; Supplement 7 [1987] (Group 3 (not classifiable))

Mutagenic Data

Available data characterizes this substance as mutagenic.

Reproductive Effects Data

Available data characterizes this substance as a reproductive hazard.

RTECS Reproductive Effects

The components of this material have been reviewed, and RTECS publishes the following endpoints:

Graphite, Synthetic (7440-44-0)

167 mg/kg Subcutaneous Rat TDLo (pregnant 8 day(s))

Nickel (7440-02-0)

158 mg/kg Oral Rat TDLo (Multigeneration)

Tumorigenic Data

No data available for the mixture.

Specific Target Organ Toxicity - Single Exposure

respiratory system, kidneys, systemic toxicity

Specific Target Organ Toxicity - Repeated Exposure

respiratory system

Aspiration Hazard

No data available.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity

Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

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Component Analysis - Aquatic Toxicity

Nickel (7440-02-0)

Fish: 96 Hr LC50 Brachydanio rerio: >100 mg/L; 96 Hr LC50 Cyprinus carpio: 1.3 mg/L [semi-static]; 96 Hr LC50 Cyprinus carpio: 10.4 mg/L [static]

Algae: 72 Hr EC50 Pseudokirchneriella subcapitata: 0.18 mg/L; 96 Hr EC50 Pseudokirchneriella subcapitata: 0.174 - 0.311 mg/L [static]

Invertebrate: 48 Hr EC50 Daphnia magna: >100 mg/L; 48 Hr EC50 Daphnia magna: 1 mg/L [Static]

Persistence and Degradability

No information available for the mixture.

Bioaccumulative Potential

No information available for the mixture.

Mobility

No information available for the mixture.

Other Adverse Effects

No data available.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Dispose in accordance with all applicable regulations.

Component Waste Numbers

Chromium (7440-47-3)

RCRA: 5.0 mg/L regulatory level

Section 14 - TRANSPORT INFORMATION

US DOT Information

Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Contains: Nickel)

UN/NA #: UN3077 **Hazard Class:** 9 **Packing Group:** III

Required Label(s): 9

Component Marine Pollutants (DOT)

This material does not contain any chemicals listed on the Hazardous Materials Table required by US DOT to be identified as a marine pollutant.

IATA Information

Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Contains: Nickel)

UN #: UN3077 **Hazard Class:** 9 **Packing Group:** III

Required Label(s): 9

IMDG Information

Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Contains: Nickel)

UN #: UN3077 **Hazard Class:** 9 **Packing Group:** III

Required Label(s): 9

Component Marine Pollutants (IMDG)

This material does not contain any chemicals listed in Chapter 3.2 - Dangerous Good List - required by IMDG to be identified as a marine pollutant.

Marine Pollutant(s) based on 2.9.3 of the UN Model Regulations

NICKEL

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Section 15 - REGULATORY INFORMATION

Component Analysis

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

Nickel (7440-02-0)

SARA 313: 0.1 % de minimis concentration

CERCLA: 100 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 45.4 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

Chromium (7440-47-3)

SARA 313: 1.0 % de minimis concentration

CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm)

SARA 311/312 Hazardous Categories

Acute Health: Yes **Chronic Health:** Yes **Fire:** No **Pressure:** No **Reactive:** No

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
Nickel	7440-02-0	Yes	Yes	Yes	Yes	Yes
Chromium	7440-47-3	Yes	Yes	Yes	Yes	Yes
Iron	7439-89-6	Yes	No	No	No	No
Silicon	7440-21-3	No	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

U.S. Inventory (TSCA)

All the components of this substance are listed on or are exempt from the TSCA inventory listing.

Component Analysis - Inventory

Component	CAS	US
Graphite, Synthetic	7440-44-0	Yes
Nickel	7440-02-0	Yes
Chromium	7440-47-3	Yes
Iron	7439-89-6	Yes
Silicon	7440-21-3	Yes

EU - REACH (1907/2006) - Article 59(1) Candidate List of Substances for Eventual Inclusion in Annex XIV

No component(s) of this material are listed.

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

No component(s) of this material are listed.

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EU - REACH (1907/2006) - Annex XVII Restrictions of Certain Dangerous Substances, Mixtures and Articles
Nickel (7440-02-0)

Use restricted. See item 27.

Section 16 - OTHER INFORMATION

NFPA Ratings: Health: 2 Fire: 0 Reactivity: 0

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

New SDS: 4/16/2015

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; BOD - Biochemical Oxygen Demand; C - Celsius; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; DOT - Department of Transportation; EPA - Environmental Protection Agency; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; Kow - Octanol/water partition coefficient; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; OSHA - Occupational Safety and Health Administration; RCRA - Resource Conservation and Recovery Act; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

Disclaimer

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End of Sheet 0014P