

## Safety Data Sheet

Material Name: Graphite with Tungsten Additive: AXF-5Q5W, AXF-5Q10W, AXF-5Q20W

SDS ID: 0148P

**Section 1 - PRODUCT AND COMPANY IDENTIFICATION****Material Name**

Graphite with Tungsten Additive: AXF-5Q5W, AXF-5Q10W, AXF-5Q20W

**Product Use**

Industrial and Medical applications

**Restrictions on Use**

None known.

**Details of the supplier of the safety data sheet**

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  
E-mail: Product.stewardship@entegris.com

**Section 2 - HAZARDS IDENTIFICATION****Classification in accordance with paragraph (d) of 29 CFR 1910.1200.**

None needed according to classification criteria.

**GHS Label Elements****Symbol(s)**

None needed according to classification criteria.

**Signal Word**

None needed according to classification criteria

**Hazard Statement(s)**

None needed according to classification criteria.

**Precautionary Statement(s)****Prevention**

None needed according to classification criteria.

**Response**

None needed according to classification criteria.

**Storage**

None needed according to classification criteria.

**Disposal**

Dispose of contents/container in accordance with local/regional/national/international regulations.

**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 16: Other information.

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**Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS**

CAS	Component Name	Percent
7782-42-5	Graphite	80-95
7440-33-7	Tungsten	5-20

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

**Section 4 - 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.

**Most Important Symptoms/Effects****Acute**

eye irritation

**Delayed**

circulatory system damage, liver damage

**Indication of any immediate medical attention and special treatment needed**

Treat symptomatically and supportively.

**Section 5 - FIRE FIGHTING MEASURES****Extinguishing Media****Suitable Extinguishing Media**

Use extinguishing agents appropriate for surrounding fire.

**Unsuitable Extinguishing Media**

None known.

**Special Hazards Arising from the Chemical**

Negligible fire hazard.

**Hazardous Combustion Products**

oxides of carbon, oxides of tungsten

**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.

**Special Protective Equipment and Precautions for Firefighters**

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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

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.

#### 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.

#### Environmental Precautions

Avoid release to the environment.

### Section 7 - HANDLING AND STORAGE

#### Precautions for Safe Handling

Wear eye/face protection. Wash thoroughly after handling. Avoid breathing dust. Avoid contact with eyes, skin and clothing.

#### 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. 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

### Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

#### Component Exposure Limits

Graphite	7782-42-5
ACGIH:	2 mg/m <sup>3</sup> TWA (all forms except graphite fibers ) respirable particulate matter
OSHA (US):	15 mg/m <sup>3</sup> TWA (synthetic ) total dust ; 5 mg/m <sup>3</sup> TWA (synthetic ) respirable fraction

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<b>Tungsten</b>	<b>7440-33-7</b>
ACGIH:	3 mg/m <sup>3</sup> TWA respirable particulate matter
NIOSH:	5 mg/m <sup>3</sup> TWA
	10 mg/m <sup>3</sup> STEL

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

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

**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.

**Individual Protection Measures, such as Personal Protective Equipment**

**Eye/face protection**

Wear safety glasses with side shields.

**Skin Protection**

Wear appropriate chemical resistant clothing.

**Respiratory Protection**

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

**Glove Recommendations**

Wear appropriate chemical resistant gloves.

<b>Section 9 - PHYSICAL AND CHEMICAL PROPERTIES</b>
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<b>Appearance</b>	gray to black solid	<b>Physical State</b>	solid
<b>Odor</b>	odorless	<b>Color</b>	gray to black
<b>Odor Threshold</b>	Not available	<b>pH</b>	Not available
<b>Melting Point</b>	Not available	<b>Boiling Point</b>	3648.9 °C
<b>Boiling Point Range</b>	Not available	<b>Freezing point</b>	Not available
<b>Evaporation Rate</b>	Not available	<b>Flammability (solid, gas)</b>	Not flammable
<b>Autoignition Temperature</b>	Not available	<b>Flash Point</b>	(Not flammable )
<b>Lower Explosive Limit</b>	Not available	<b>Decomposition temperature</b>	Not available
<b>Upper Explosive Limit</b>	Not available	<b>Vapor Pressure</b>	Not available
<b>Vapor Density (air=1)</b>	Not available	<b>Specific Gravity (water=1)</b>	Not available
<b>Water Solubility</b>	(Insoluble )	<b>Partition coefficient: n-octanol/water</b>	Not available

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<b>Viscosity</b>	Not available	<b>Kinematic viscosity</b>	Not available
<b>Solubility (Other)</b>	Not available	<b>Density</b>	1.8 - 2.4 g/cc
<b>Physical Form</b>	solid	<b>Sublimation</b>	3650 °C
<b>Molecular Weight</b>	Not available		

**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.

**Incompatible Materials**

oxidizing materials

**Hazardous decomposition products****Thermal decomposition products**

oxides of carbon, oxides of tungsten

**Section 11 - TOXICOLOGICAL INFORMATION****Information on Likely Routes of Exposure****Inhalation**

No information on significant adverse effects.

**Skin Contact**

No information on significant adverse effects.

**Eye Contact**

irritation

**Ingestion**

No information on significant adverse effects.

**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.

**Product Toxicity Data****Acute Toxicity Estimate**

No data available.

**Immediate Effects**

eye irritation

**Delayed Effects**

circulatory system damage, liver damage

**Irritation/Corrosivity Data**

eye irritation

**Respiratory Sensitization**

No data available.

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**Dermal Sensitization**

No data available.

**Component Carcinogenicity**

None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA.

**Germ Cell Mutagenicity**

No data available for the mixture.

**Tumorigenic Data**

No data available for the mixture.

**Reproductive Toxicity**

No data available for the mixture.

**Specific Target Organ Toxicity - Single Exposure**

No data available.

**Specific Target Organ Toxicity - Repeated Exposure**

circulatory system, liver

**Aspiration hazard**

No data available.

**Medical Conditions Aggravated by Exposure**

No data available.

**Section 12 - ECOLOGICAL INFORMATION****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**

No data available for the mixture.

**Other Toxicity**

No data available.

**Section 13 - DISPOSAL CONSIDERATIONS****Disposal Methods**

Dispose in accordance with all applicable regulations.

**Component Waste Numbers**

The U.S. EPA has not published waste numbers for this product's components.

**Section 14 - TRANSPORT INFORMATION****US DOT Information:**

UN/NA #: Not regulated

**IATA Information:**

UN#: Not regulated

**IMDG Information:**

UN#: Not regulated

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**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**

**U.S. Federal Regulations**

None of this product's components are listed 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), or require an OSHA process safety plan.

**SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories**

No hazard categories applicable.

**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
<b>Graphite</b>	<b>7782-42-5</b>	Yes	Yes	Yes	Yes	Yes
<b>Tungsten</b>	<b>7440-33-7</b>	Yes	Yes	Yes	Yes	Yes

**Not listed under California Proposition 65**

**Canada Regulations**

**Canadian WHMIS Ingredient Disclosure List (IDL)**

Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL

<b>Tungsten</b>	<b>7440-33-7</b>
	1 %

**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

**Tungsten (7440-33-7)**

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	DS L	EI N	Yes	Yes	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes

**U.S. Inventory (TSCA)**

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

**Section 16 - OTHER INFORMATION**

**Further information**

09/25/2017 - Update to Section(s) 3, 4, 11, 16. Section 3 update: Replaced CAS #7440-44-0 with CAS #7782-42-5. 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: Combustible Dust; Serious Eye Damage/Eye Irritation, Category 2A; Specific Target Organ Toxicity - Repeated Exposure, Category 2: circulatory system, liver.

**NFPA Ratings**

Health: 1 Fire: 0 Reactivity: 0

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

**Preparation Date**

12/18/2015

**Revision date**

09/25/2017

**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; 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; NDSL - Non-Domestic Substance List (Canada); NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PEL - Permissible Exposure Limit; PH - Philippines; RCRA



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- Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; 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 NCI (Draft) - Vietnam National Chemicals Inventory (NCI) (Draft); WHMIS - Workplace Hazardous Materials Information System (Canada) .

### **Other 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.