

**SAFETY DATA SHEET****Graphite Foil - Reinforced Sheets (2030R, 2030E, 2030S, 2030P)****SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION**

- Product Name:** Graphite Foil with Stainless Steel Reinforcement (2030R)
Graphite Foil with Stainless Steel Tang Reinforcement (2030E)
Graphite Foil with Wire Mesh Reinforcement (2030S)
Graphite Foil with Mylar Reinforcement (2030P)
Reinforced Graphite Sheets
Flexible Graphite Reinforced
- Chemical Name:** Graphite / Flexible Graphite
- Primary Use:** Graphite Foil products are excellent sealing materials and gaskets for high temperature, high pressure transfer of liquids, gases, steam, chemicals, and corrosives. Reinforced sheets have insert material in the middle of two graphite foil sheets.
- Identified Uses:** Material is typically used in refineries, chemical, and petrochemical plants, paper mills, other industrial applications and include but are not limited to the following:

General Foil uses:

- Separation layer for fuel cell and flow battery applications
- Thermally conductive and chemical resistant gaskets, seals, and liners
- Insulators Release foils in glasswork and hot presses
- EMI (electromagnetic interference) and chemical shield
- Thermal management and heat dissipation liner
- Cathodes for electrolysis of liquids
- Dry sheet lubricant, stress sensing, vibration damping, spark plasma sintering (SPS) and other thermal electronic / electrochemical applications

2030R, 2030E, 2030S

- Ideal sheet gasket material for industrial fluid sealing Recommended for 150-300 class service.
- Meets stringent emission regulations and is blow-out resistant.
- 2030E may substitute spiral wound gaskets

2030P

- Flange gaskets in relatively low pressure sealing conditions.

Distributor / Manufacturer:

CeraMaterials
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Emergency Contact: Jerry Weinstein
Product Stewardship: 518.701.6722
E-Mail: sales@ceramaterials.com
www.ceramaterials.com

24hr Emergency Contact Info:

Poison Control Center:	877.671.4608
CHEMTREC US Transportation:	800.424.9300
CHEMTREC International Transportation:	703.741.5500



SECTION 2 - HAZARDS IDENTIFICATION

Hazard Classification	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
Classification of substance	Not classified
GHS Label Elements	
Label elements	No label elements (non-hazardous product)
Signal word	No signal word (non-hazardous product)
Hazard symbol	No symbol (non-hazardous product)
Hazard statement	No known significant effects or critical hazards
Precautionary Statements	
Prevention	Not applicable
Response	Not applicable
Storage	Not applicable
Disposal	Not applicable
Hazards not otherwise classified	None known

SECTION 3 - COMPOSITION

<u>Chemical & Common Name</u>	<u>CAS#</u>	<u>% By Weight</u>
Flexible Graphite (Mineral Graphite, Carbon)	7782-42-5	≥ 14 - 99 %
Crystalline Silica (Impurity ash, silica, silica dioxide, quartz)	14808-60-7	≤ 0.2 %
316 Stainless Steel (Alloy of Fe, Ni, Cr, Mo, etc.)	N/D	5 - 85 %

***Composition below for grade 2030P**

<u>*Chemical & Common Name</u>	<u>CAS#</u>	<u>% By Weight</u>
Flexible Graphite (Mineral Graphite, Carbon)	7782-42-5	≥ 92 - 99 %
Crystalline Silica (Impurity ash, silica, silica dioxide, quartz)	14808-60-7	≤ 0.2 %
Polyester / Mylar / PET (Polyethylene terephthalate)	25038-59-9	1 - 7 %



SECTION 4 - FIRST AID MEASURES

Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion.

General Measures:

Remove individual from area of exposure.

Inhalation:

Remove affected personnel to an exposure-free (dust free) environment and keep at rest in a position comfortable for breathing. Give oxygen if breathing is difficult. Get medical attention if symptoms occur and respiratory tract irritation continues.

Skin

Remove contaminated clothing, brush material off skin, wash affected area with plenty of soap and water. Get medical attention if skin irritation develops or persists.

Eyes

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for & remove any contact lenses. Get medical attention if eye irritation develops or persists.

Ingestion:

Unlikely to occur. If gastrointestinal tract irritation develops. Wash out mouth with water. Remove individual to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur or persist.

Most Important Symptoms / Effects, Acute & Delayed:

None known.

Other possible effects:

The product is not a hazardous material in normal use. High concentration of graphite dust may be irritating to eyes, skin and respiratory tract. Inhalation of high concentrations of graphite dust over prolonged periods of time may cause pneumoconiosis. See section 8 for additional information on exposure controls and personal protection.

Indication of Immediate Medical Attention and Special Treatment: None known.

Notes to physicians:

Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments: No specific treatment



SECTION 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable extinguishing media	Flexible graphite is not flammable. Use an extinguishing agent suitable for the surrounding fire. The product should be cooled with water.
Unsuitable extinguishing media	No information available.
Specific hazards arising from the material	Thermal decomposition may produce smoke and oxides of carbon.
Special protective actions for fire-fighters	No special measures are required.
Special protective equipments for fire-fighters	Fire-fighters should wear appropriate protective clothing and breathing equipment appropriate to the surrounding fire.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures:

Wear appropriate respiratory and protective equipment specified in Section 8 based on exposure concentrations. Isolate spill area and provide ventilation. Avoid breathing dust or fume. Avoid contact with skin and eyes.

Methods and Materials for Containment and Cleaning Up:

Materials are solid. If fabrication is taking place, avoid creating dust. Scoop or vacuum up spill / dust using a vacuum system equipped with a high efficiency particulate air (HEPA) filtration system and place in a properly labeled closed container for further handling and disposal.

Environmental Precautions:

Do not allow to enter drains or sewers.

SECTION 7 - HANDLING AND STORAGE

Precautions for Safe Handling:

Normal handling and storing of graphite does not require special precautions. Minimize accumulation and creation of graphite debris and dust in the work area. Graphite is electrically conductive. Graphite debris and dust may cause shorting of electrical circuits or equipment malfunctioning. Practice good house keeping and provide adequate ventilation if dust is present. Avoid breathing dust or fumes. Avoid contact with skin and eyes. Wash thoroughly before eating or smoking. See Section 8 for information on personal protection equipment.



Conditions for Safe Storage:

Store original container in a cool, dry area. Keep container closed when not in use. No known incompatible substances under normal conditions. See section 10 for more information on incompatible materials.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available.

Engineering controls.

Use good housekeeping practices. Use general or local exhaust ventilation, dust collection, and other equipment designed to minimize dust and reduce concentrations of airborne contaminants / dust below occupational limits.

Individual protection measures, such as personal protective equipment.

Personal protective equipment:

Eye protection :

If dusts or debris are generated during processing, wear safety glasses with side shields or other forms of eye protection in compliance with appropriate OSHA standards.

Skin protection:

Wear personal protective equipment (e.g gloves to prevent cuts, abrasions and irritation during handling and processing), as necessary to prevent skin irritation. Washable or disposable clothing may be used. If possible, do not take unwashed clothing home. If soiled work clothing must be taken home, employees should be informed on best practices to minimize non-work dust exposure (e.g., vacuum cloths before leaving the work area, wash work clothing separately, and rinse washer before washing other household cloths).

Respiratory protection:

Use NIOSH-approved respiratory protective equipment if exposures exceed established limits. For example, a N-95 dust mask, half face-piece or full face-piece air purifying respirator equipped with a NIOSH certified P95 particulate filter cartridge or PAPR with tight-fitting full face-piece is recommended depending on the exposure level.

General Hygiene considerations:

As a good practice, wash hands before eating, drinking, or smoking and do not store food, eat, or drink, in areas where chemicals are handled.



OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)

EXPOSURE LIMITS

Chemical Name	CAS #	Agency	Type	Limit	
Flexible Graphite (carbon, mineral graphite)	7782-42-5	OSHA Z-1	PEL	5mg/m ³ [1]	
			PEL	15mg/m ³ [2]	
		OSHA Z-3	TWA	15 million particles	
			ACGIH TLV	TLV TWA	2 mg/m ³ [1]
			NIOSH	TWA	2.5 mg/m ³ [1]
Crystalline Silica (impurity ash, silica, quartz silica dioxide)	14808-60-7	OSHA Z-3	TWA	0.3mg/m ³ [2]	
			TWA	0.1m/m ³ [1]	
			TWA	2.4 million particles	
		ACGIH TLV	TLV TWA	0.025mg/m ³ [1]	

Footnotes:

- 1. Respirable fraction
- 2. Total Dust

TWA : Total-Weighted-Average

* Other jurisdictions may have different exposure limits & control guidelines. Users are advised to consult & comply with local regulations

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance & State:	Black Solid	LEL/UEL:	No data available
Odor:	Odorless	Vapor pressure:	No data available
Odor threshold:	Not applicable	Vapor density:	Not applicable
pH:	Not applicable	Specific Gravity:	0.7 - 5.1 (Graphite 1.1, Steel 8.0) 0.8 - 1.7 (2030P Grade)
Melting point:	5400°F 2982°C	Water Solubility:	Insoluble
Boiling point:	No data available	Viscosity:	Not applicable
Flash point:	Not applicable	Autoignition temperature:	No data available
Evaporation rate:	Not applicable	Decomposition temperature:	No data available
Flammability (solid, gas):	No data available	Partition coefficient (n-octanol/water):	No data available

SECTION 10 - STABILITY AND REACTIVITY

Chemical Stability	The product is stable under conditions of normal use.
Incompatibility	Strong oxidizing agent.
Conditions to avoid	None.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Carbon dioxide CO ₂
Hazardous polymerization	Not applicable



SECTION 11 - TOXICOLOGICAL INFORMATION

Information On Toxicological Information

Likely Routes of Exposure Inhalation, skin and eyes.
Symptoms of Exposure No adverse effects under normal exposure conditions. Dust may cause irritation to eyes, abraded skin, and respiratory tract if inhaled.

Toxicological data

Acute Toxicity

Table with 4 columns: Name, Route, Species, Value. Row 1: Graphite, Oral, Rat, LD50 > 1000 mg/kg

Skin corrosion / irritation No adverse effects are expected.
Serious eye damage / eye irritation No adverse effects are expected.
Respiratory sensitization No data.
Skin sensitization Not a skin sensitizer.
Central Nervous System (CNS) Depression Very unlikely, not data available.
Peripheral Neuropathy Very unlikely, no data available.
Reproductive / Developmental Toxicity No data.
Germ cell mutagenicity No data.
Carcinogenicity Graphite is not classified. Impurity ash crystalline silica is classified as known or suspected human carcinogen by IATC, NTP, and ACGIH.
Single exposure target organ effects No data.
Prolonged / repeated exposure target organ effects No data.
Aspiration hazard Not classified.
Chronic effects Unlikely.

Additional toxicological information is available through the U.S. National Institute for Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemical Substances (RTECS).

See website: https://www.cdc.gov/niosh/npg/npgdrtec.html

Graphite RTECS # MD9659600
Carbon RTECS # FF5250100

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity Not an environmental hazard.
Persistence and degradability Not degradable
Bioaccumulative potential Not applicable
Mobility in soil There is no data available.
Other adverse effects No known other adverse effects to the environment



SECTION 13 - DISPOSAL CONSIDERATIONS

Disposal Methods:

The generation of waste should be avoided or minimized wherever possible. Recover and recycle if practical, or utilize an approved landfill. This material is not specifically listed as hazardous waste in federal regulations. Disposal of this product, solutions, and any by-products should comply with the requirements of the environmental protection and waste disposal legislation in your geographical location (Federal, local, regional, state, or provincial regulations).

Hazardous waste code:

Not established.

Product

Dispose of in accordance with Federal, State, and Local regulations.

Packaging

Dispose of in accordance with Federal, State, and Local regulations.

Waste from residues / unused products:

Follow the same disposal requirements for the packaging material.

SECTION 14 - TRANSPORT INFORMATION

This product (Graphite) is not regulated as a hazardous material for transportation purposes by any known authority. (DOT, IATA, IMDG)

Shipping Regulations:	Not regulated.
UN Number:	Not assigned.
UN Proper Shipping Name:	Not specified.
Transport Hazard Class:	Not classified.
Packaging Group:	Not applicable.
Environmental Hazards (e.g., Marine pollutant (Yes / No) :	No.
Transport in bulk (According to Annex II of MARPOL 73/78 and the IBC Code):	Not available.
Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises:	None.



SECTION 15 - REGULATORY INFORMATION

US Federal Regulations.

Under some use conditions, this material may be considered to be hazardous in accordance with OSHA 29 CFR 1910.1200

US State Regulations.

WARNING: This product contains chemical known to the state of California to cause cancer: Impurity Ash Content: Crystalline silica CAS 14808-60-7 (less than 0.2%)
California Proposition 65 Carcinogens & Reproductive Toxicity (CRT): Listed substance.

International Regulations.

This product is listed by multiple countries as inventory - chemical substance. It complies with the inventory requirements administered by the governing county.

SECTION 16 - OTHER INFORMATION

Hazardous Materials Identification System (HMIS) Hazard Rating:

Health	1*
Flammability	0
Physical Hazard	0
Personal Protective Equipment	X**

*Indicates possible chronic health effects from continuing exposures

**To be determined by the user

Effective Date: May 1, 2018

Revision Summary: Company Information updated.

Revision Date: July 28, 2020

SDS Prepared By: CeraMaterials

Disclaimer

The information presented herein is presented in good faith and believed to be accurate as the effective date of this Safety Data Sheet. Employers may use this SDS to supplement other information gathered by them in their efforts to assure the health and safety of their employees and the proper use of the product. This summary of the relevant data reflects professional judgement; employers should note that information perceived to be less relevant has not been included in this SDS. Therefore, given the summary nature of this document, CeraMaterials does not extend any warranty (expressed or implied), assume any responsibility, or make any representation regarding the completeness of this information or its suitability for the purposes envisioned by the user.