Safety Data Sheet

Section 1: Identification of the Substance/ Mixture and of the Company/ Undertaking

1.1 Product identifier
Product Name: Synthetic Graphite Electrode

1.2 Relevant identified uses of the substance or mixture and uses advised against
Relevant identified use(s): Electric Arc Furnaces

Details of the supplier of the safety data sheet
Manufacturer: Superior Graphite
10 S. Riverside Plaza
Chicago, IL 60606
United States

Telephone (General): 312-559-2999 - (8am-5pm CST, M-F)

1.3 Emergency telephone number
Manufacturer: 1-800-424-9300  - For Hazardous Materials [or Dangerous Goods] Incident Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night
Manufacturer: +1 703-527-3887 - Outside USA and Canada (collect calls accepted)

Section 2: Hazards Identification

EU/EEC
According to: EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture
CLP: Not classified
DSD/DPD: Not classified

2.2 Label Elements
CLP
Hazard statements: No label element(s) required

DSD/DPD

2.3 Other Hazards
CLP
May form combustible dust concentrations in air.
According to Regulation (EC) No. 1272/2008 (CLP) this material is not considered hazardous.

DSD/DPD
May form combustible dust concentrations in air.
According to European Directive 1999/45/EC this material is not considered dangerous.
United States (US)
According to: OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture
OSHA HCS 2012

2.2 Label elements
OSHA HCS 2012

Hazard statements
May form combustible dust concentrations in air.

2.3 Other hazards
OSHA HCS 2012


Canada
According to: WHMIS

2.1 Classification of the substance or mixture
WHMIS

2.2 Label elements
WHMIS

2.3 Other hazards
WHMIS

May form combustible dust concentrations in air.

In Canada, the product mentioned above is not considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

3.1 Substances

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Identifiers</th>
<th>%</th>
<th>LD50/LC50</th>
<th>Classifications According to Regulation/Directive</th>
<th>Comments</th>
</tr>
</thead>
</table>

3.2 Mixtures

Material does not meet the criteria of a mixture.

Section 4 - First Aid Measures

4.1 Description of first aid measures
Inhalation

Move victim to fresh air. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. If breathing is difficult get medical attention.

Skin

IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse. If irritation develops and persists, get medical attention.

Eye

In case of contact with substance, immediately flush eyes with running water for at least 20 minutes. Get medical attention.

Ingestion

Do NOT induce vomiting. Rinse mouth. Do not give anything by mouth to an unconscious person. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

4.4 Other information

Call 911 or emergency medical service. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

Section 5.1 Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media

LARGE FIRE: Water spray, fog or regular foam.
SMALL FIRES: Dry chemical, CO2, water spray or regular foam.

Unsuitable Extinguishing Media

No data available.

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards

Dust dispersed in air in sufficient concentrations and in the presence if an ignition source is an explosion hazard.

Hazardous Combustion Products

Graphite will burn, giving off carbon dioxide and potentially carbon monoxide.

5.3 Advice for firefighters

Wear positive pressure self-contained breathing apparatus (SCBA).
‘Structural firefighters’ protective clothing will only provide limited protection.
LARGE FIRES: Move containers from fire area if you can do it without risk.
LARGE FIRES: Do not scatter spilled material with high pressure water streams.
LARGE FIRES: Dike fire-control water for later disposal.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions

Avoid contact with material that generates respirable dust unless proper PPE is used.
Do not walk through spilled material.

Emergency Procedures

Use normal clean up procedures. Ventilate closed spaces before entering.

6.2 Environmental precautions

Avoid run off to waterways and sewers.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

Carefully shovel or sweep up spilled material and place in suitable container.
Avoid generating dust.

6.4 Reference to other sections
Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling

- Use only with adequate ventilation. Use appropriate Personal Protective Equipment (PPE). Do not breathe dust. Avoid accumulation of dust. Good housekeeping practices should be in place to prevent accumulation of dusts on surfaces. If dusts are generated during processing eliminate ignition sources. Take precautionary measures against static charges. Graphite is conductive and can cause short circuits and other electrical malfunctions. Graphite causes slippery conditions. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

7.2 Conditions for safe storage, including any incompatibilities

Storage

- Ventilate enclosed areas. Keep container closed.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Exposure Limits Supplemental</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Graphite (7782-42-5): Mineral Dusts: (15 mppcf TWA (natural))</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Result</th>
<th>ACGIH</th>
<th>NIOSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphite (7782-42-5) TWA</td>
<td>2 mg/m³ TWA (all forms except graphite fibers, respirable fraction)</td>
<td>2.5 mg/m³ TWA (natural, respirable dust)</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Engineering Measures/Controls

- Adequate ventilation systems as needed to control concentrations of airborne contaminants below applicable threshold limit values. All dust control equipment should contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment. Make sure that dust handling systems are designed to prevent escape of dust into the work area and that they do not leak.

Personal Protective Equipment

Respiratory

- For limited exposure use an N95 dust mask. For prolonged exposure use an air-purifying respirator with high efficiency particulate air (HEPA) filters. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/face

- Wear protective eyewear (goggles, face shield, or safety glasses). Eye wash station should be available.

Hands

- Wear protective gloves.

Skin/Body

- Wear long sleeves and/or protective coveralls.

Environmental Exposure Controls

- Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent...
spills, atmospheric release and release to waterways.

Key to abbreviations
ACGIH = American Conference of Governmental Industrial Hygiene
NIOSH = National Institute of Occupational Safety and Health
OSHA = Occupational Safety and Health Administration
TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Material Description</th>
<th>Physical Form</th>
<th>Appearance/Description</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Solid</td>
<td>Gray solid with no odor.</td>
</tr>
<tr>
<td>Color</td>
<td>Gray</td>
<td>Odor</td>
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<tr>
<td>Odor Threshold</td>
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<table>
<thead>
<tr>
<th>General Properties</th>
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<tbody>
<tr>
<td>Boiling Point</td>
<td>Data lacking</td>
<td>Melting Point</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Data lacking</td>
<td>pH</td>
</tr>
<tr>
<td>Specific Gravity/Relative Density = 2.25 Water=1</td>
<td>Data lacking</td>
<td>Water Solubility</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Data lacking</td>
<td>Explosive Properties</td>
</tr>
<tr>
<td>Oxidizing Properties:</td>
<td>Data lacking</td>
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</table>

<table>
<thead>
<tr>
<th>Volatility</th>
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</thead>
<tbody>
<tr>
<td>Vapor Pressure</td>
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<td>Vapor Density</td>
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<tr>
<td>Evaporation Rate</td>
<td>Data lacking</td>
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</table>

<table>
<thead>
<tr>
<th>Flammability</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>Not relevant</td>
<td>UEL</td>
</tr>
<tr>
<td>LEL</td>
<td>Not relevant</td>
<td>Autoignition</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Data lacking</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Octanol/Water Partition coefficient</td>
<td>Data lacking</td>
<td></td>
</tr>
</tbody>
</table>

9.2 Other Information

No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions

Will not occur.

10.4 Conditions to avoid

Accumulation of dusts - mixtures of graphite dust and air are explosive when ignited.

10.5 Incompatible materials

Strong oxidizing agents, acids, and alkalis.

10.6 Hazardous decomposition products
Section 11 - Toxicological Information

11.1 Information on toxicological effects

<table>
<thead>
<tr>
<th>Components</th>
<th>Multi-dose Toxicity: Inhalation-Hamster TCLo • 3 mg/m³ 6 Hour(s) 78 Week(s)-Intermittent; Lungs, Thorax, or Respiration: Fibrosis (interstitial); Lungs, Thorax, or Respiration: Changes in lung weight; Tumorigen / Carcinogen: Inhalation-Rat TCLo • 50 mg/m³ 6 Hour(s) 71 Week(s)-Intermittent; Tumorigenic: Carcinogenic by RTECS criteria: Liver: Tumors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz (&lt;0.1%) 14808-60-7</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>GHS Properties</th>
<th>Classification</th>
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<tbody>
<tr>
<td>Acute toxicity</td>
<td>EU/CLP • Data lacking</td>
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<tr>
<td></td>
<td>OSHA HCS 2012 • Data lacking</td>
</tr>
<tr>
<td>Aspiration Hazard</td>
<td>EU/CLP • Data lacking</td>
</tr>
<tr>
<td></td>
<td>OSHA HCS 2012 • Data lacking</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>EU/CLP • Data lacking</td>
</tr>
<tr>
<td></td>
<td>OSHA HCS 2012 • Data lacking</td>
</tr>
<tr>
<td>Germ Cell Mutagenicity</td>
<td>EU/CLP • Data lacking</td>
</tr>
<tr>
<td></td>
<td>OSHA HCS 2012 • Data lacking</td>
</tr>
<tr>
<td>Skin corrosion/Irritation</td>
<td>EU/CLP • Data lacking</td>
</tr>
<tr>
<td></td>
<td>OSHA HCS 2012 • Data lacking</td>
</tr>
<tr>
<td>Skin sensitization</td>
<td>EU/CLP • Data lacking</td>
</tr>
<tr>
<td></td>
<td>OSHA HCS 2012 • Data lacking</td>
</tr>
<tr>
<td>STOT-RE</td>
<td>EU/CLP • Data lacking</td>
</tr>
<tr>
<td></td>
<td>OSHA HCS 2012 • Data lacking</td>
</tr>
<tr>
<td>STOT-SE</td>
<td>EU/CLP • Data lacking</td>
</tr>
<tr>
<td></td>
<td>OSHA HCS 2012 • Data lacking</td>
</tr>
<tr>
<td>Toxicity for Reproduction</td>
<td>EU/CLP • Data lacking</td>
</tr>
<tr>
<td></td>
<td>OSHA HCS 2012 • Data lacking</td>
</tr>
<tr>
<td>Respiratory sensitization</td>
<td>EU/CLP • Data lacking</td>
</tr>
<tr>
<td></td>
<td>OSHA HCS 2012 • Data lacking</td>
</tr>
<tr>
<td>Serious eye damage/Irritation</td>
<td>EU/CLP • Data lacking</td>
</tr>
<tr>
<td></td>
<td>OSHA HCS 2012 • Data lacking</td>
</tr>
</tbody>
</table>

Route(s) of entry/exposure: Inhalation, Skin, Eye, Ingestion
Medical Conditions: Disorders of the lungs.
Aggravated by Exposure: None.
Potential Health Effects:
Inhalation
- Acute (Immediate): Exposure to dust may cause irritation.
- Chronic (Delayed): No data available.
Skin
- Acute (Immediate): Exposure to dust may cause mechanical irritation.
- Chronic (Delayed): No data available.
**Eye**

**Acute (Immediate)**
- Exposure to dust may cause mechanical irritation. Excessive concentrations of nuisance dust in the workplace may reduce visibility and may cause unpleasant deposits in eyes.

**Chronic (Delayed)**
- No data available.

**Ingestion**

**Acute (Immediate)**
- Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes.

**Chronic (Delayed)**
- No data available.

**Carcinogenic Effects**
- This material contains Quartz which is considered a carcinogen, however this material as a whole is not classified as a carcinogen.

<table>
<thead>
<tr>
<th>Carcinogenic Effects</th>
<th>CAS</th>
<th>IARC</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>14808-60-7</td>
<td>Group 1-Carcinogenic</td>
<td>Known Human Carcinogen</td>
</tr>
</tbody>
</table>

Key to abbreviations

TC = Toxic Concentration

---

**Section 12 - Ecological Information**

**12.1 Toxicity**
- Data lacking.

**12.2 Persistence and degradability**
- Data lacking.

**12.3 Bioaccumulative potential**
- Data lacking.

**12.4 Mobility in Soil**
- Data lacking.

**12.5 Results of PBT and vPvB assessment**
- PBT and vPvB assessment has not been conducted for this material.

**12.6 Other adverse effects**
- No studies have been found.

---

**Section 13 - Disposal Considerations**

**13.1 Waste treatment methods**

**Product waste**
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

**Packaging waste**
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

---

**Section 14 - Transport Information**

<table>
<thead>
<tr>
<th>14.1 UN number</th>
<th>14.2 UN proper shipping name</th>
<th>14.3 Transport hazard class(es)</th>
<th>14.4 Packing group</th>
<th>14.5 Environmental hazards</th>
</tr>
</thead>
</table>

14.6 Special precautions for user

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Data lacking.

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

SARA Hazard Classifications

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>Canada DSL</th>
<th>Canada NDSL</th>
<th>EU EINECS</th>
<th>EU ELNICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphite</td>
<td>7782-42-5</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Quartz</td>
<td>14808-60-7</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Canada - WHMIS - Classifications of Substances

- Quartz 14808-60-7 D2A (In certain cases, this classification does not apply. For more information, consult the section Substance Specific Issues - Silica, crystalline, encapsulated on Health Canada's WHMIS Division website.)
- Graphite 7782-42-5 D2A (natural); D2B (synthetic)

Canada - WHMIS - Ingredient Disclosure List

- Quartz 14808-60-7 1 %
- Graphite 7782-42-5 Not Listed

Environment

Canada - CEPA - Priority Substances List

- Quartz 14808-60-7 Not Listed
- Graphite 7782-42-5 Not Listed

Europe

Other

- EU - Hazardous Substances Restricted or Prohibited in Electrical Equipment (2011/65/EU) (RoHS)
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

Japan
### Environment

**Inventory - Japan - Industrial Safety and Health Law Substances (ISHL)**

- Quartz 14808-60-7 Not Listed
- Graphite 7782-42-5 Not Listed

**Other**

- **Japan - Chemical Substance Control Law (CSCL) - Monitoring Chemical Substances**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **Japan - Poisonous and Deleterious Substances - Substances Not Considered Deleterious**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **Japan - Poisonous and Deleterious Substances - Substances Not Considered Poisonous**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

### United States

**Labor**

- **U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **U.S. - OSHA - Specifically Regulated Chemicals**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

**Environment**

- **U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **U.S. - CERCLA/SARA - Section 313 - Emission Reporting**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing**
United States - California

Environment

- **U.S. - California - Proposition 65 - Carcinogens List**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed
  - Carcinogen, initial date 10/1/88 (airborne particles of respirable size)

- **U.S. - California - Proposition 65 - Developmental Toxicity**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **U.S. - California - Proposition 65 - Reproductive Toxicity - Female**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

- **U.S. - California - Proposition 65 - Reproductive Toxicity - Male**
  - Quartz 14808-60-7 Not Listed
  - Graphite 7782-42-5 Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

15.3 Other Information

- WARNING: This product contains a chemical known to the State of California to cause cancer.

Section 16 - Other Information

<table>
<thead>
<tr>
<th>Last Revision Date</th>
<th>28/October/2014</th>
</tr>
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<tbody>
<tr>
<td>Preparation Date</td>
<td>28/October/2014</td>
</tr>
<tr>
<td>Disclaimer/Statement of Liability</td>
<td>The information contained herein is based on data available. However, no warranty is expressed or implied regarding the accuracy of the data or the results obtained from the use thereof. Because the information contained herein may be applied under conditions beyond our control, we assume no responsibility for its use.</td>
</tr>
</tbody>
</table>

Key to abbreviations

NDA = No data available