**** MATERIAL SAFETY DATA SHEET ****

Graphite Powder
10561

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Graphite Powder
Catalog Numbers:
    G67 500, G67500
Synonyms:
    Black lead, crystallized carbon, mineral carbon, plumbago, CI 77265
Company Identification: Fisher Scientific
    1 Reagent Lane
    Fairlawn, NJ 07410
For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>%</th>
<th>EINECS#</th>
</tr>
</thead>
<tbody>
<tr>
<td>7782-42-5</td>
<td>GRAPHITE</td>
<td>&gt;99</td>
<td>231-955-3</td>
</tr>
<tr>
<td>14808-60-7</td>
<td>Quartz</td>
<td>&lt;1</td>
<td>238-878-4</td>
</tr>
</tbody>
</table>
Hazard Symbols: None Listed.
Risk Phrases: None Listed.

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW
Appearance: green, blue, steel gray or black.
Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Contains trace amounts of quartz which may lead to fibrotic lung disease, silicosis or cancer.
Target Organs: Lungs.

Potential Health Effects
Eye:
Causes eye irritation. May cause conjunctivitis.
Skin:
May cause skin irritation.
Ingestion:
Ingestion of large amounts may cause gastrointestinal irritation.
Inhalation:
Dust is irritating to the respiratory tract.
Chronic:
Prolonged exposure to respirable crystalline quartz may cause delayed lung injury/fibrosis (silicosis).

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin:
Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.
Ingestion:
If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.
Inhalation:
Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician:
Treat symptomatically and
Antidote:
None reported.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dust can be an explosion hazard when exposed to heat or flame. Flammable solid. Can be easily ignited and burns vigorously.
Extinguishing Media:
For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:
Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:
Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage:
Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Keep from contact with oxidizing materials.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:
Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAPHITE</td>
<td>2 mg/m³ respirable dust: 2.5 mg/m³ TWA, 1250 mg/m³ IDLH</td>
<td>see Table Z-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(respirable fraction) (all forms except graphite)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quartz</td>
<td>0.05 mg/m³ (this TLV is for the respirable fraction of dust) as respirable dust: 0.05 mg/m³ TWA, NIOSH Potential Occupational Carcinogen - see Appendix A Potential NIOSH carcinogen. [25 mg/m³ (cristobalite, tridymite); 50 mg/m³ (quartz, tripoli)]</td>
<td>see Table Z-3</td>
<td></td>
</tr>
</tbody>
</table>

OSHA Vacated PELs:
GRAPHITE:
respirable dust: 2.5 mg/m³ TWA
Quartz:
respirable dust: 0.1 mg/m³ TWA
Personal Protective Equipment

Eyes:
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:
Wear appropriate gloves to prevent skin exposure.

Clothing:
Wear appropriate protective clothing to minimize contact with skin.

Respirators:
Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Solid
Appearance: green, blue, steel gray or black
Odor: odorless
pH: Not available.
Vapor Pressure: Negligible.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not applicable.
Boiling Point: 7592 deg F
Freezing/Melting Point: 6606-6687F
Autoignition Temperature: 1346 deg F (730.00 deg C)
Flash Point: Not available.
NFPA Rating: Not published.
Explosion Limits, lower: Not available.
Explosion Limits, upper: Not available.
Decomposition Temperature: Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: 2.09-2.25
Molecular Formula: C
Molecular Weight: 12

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.

Conditions to Avoid:
Incompatible materials, ignition sources, dust generation, moisture, excess heat.

Incompatibilities with Other Materials:
May react vigorously or violently when mixed with strong oxidizing agents such as chlorates, bromates and nitrates, especially when heated. Incompatible with chlorinated paraffins, lead oxide, manganese oxide, iron oxide, liquid oxygen, oils, and moisture. Chlorinetrifluoride, fluoride and potassium superoxide. Reacts at 300C with potassium, sodium, rubidium and cesium to give intercalation compounds. These compounds ignite in air and may react explosively with water.

Hazardous Decomposition Products:
Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
   CAS# 7782-42-5: MD9659600
   CAS# 14808-60-7: VV7330000
LD50/LC50:
   Not available.
   Not available.
Carcinogenicity:
   GRAPHITE -
      Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
   Quartz -
      ACGIH: A2 - Suspected Human Carcinogen
      California: carcinogen (airborne particles of respirable size); initia
      NIOSH: occupational carcinogen
      NTP: Known carcinogen
      OSHA: Possible select carcinogen (listed as ** undefined **).
      IARC: Group 1 carcinogen
Epidemiology:
   No data available.
Teratogenicity:
   No data available.
Reproductive Effects:
   No data available.
Neurotoxicity:
   No data available.
Mutagenicity:
   No data available.
Other Studies:
   No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.
US EPA guidelines for the classification determination are listed in
40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

Canadian TDG
   No information available.
**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL
TSCA
- CAS# 7782-42-5 is listed on the TSCA inventory.
- CAS# 14808-60-7 is listed on the TSCA inventory.

Health & Safety Reporting List
- None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules
- None of the chemicals in this product are under a Chemical Test Rule.

Section 12b
- None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule
- None of the chemicals in this material have a SNUR under TSCA.

SARA
- Section 302 (RQ)
  - None of the chemicals in this material have an RQ.
- Section 302 (TPQ)
  - None of the chemicals in this product have a TPQ.

SARA Codes
- CAS # 14808-60-7: chronic.

Section 313
- No chemicals are reportable under Section 313.

Clean Air Act:
- This material does not contain any hazardous air pollutants.
- This material does not contain any Class 1 Ozone depletors.
- This material does not contain any Class 2 Ozone depletors.

Clean Water Act:
- None of the chemicals in this product are listed as Hazardous Substances under the CWA.
- None of the chemicals in this product are listed as Priority Pollutants under the CWA.
- None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
- None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

GRAPHITE can be found on the following state right to know lists:
- California, Florida, Pennsylvania, Minnesota, Massachusetts.
Quartz can be found on the following state right to know lists:

WARNING: This product contains Quartz, listed as "** undefined **", a chemical known to the state of California to cause cancer.

California No Significant Risk Level:
- None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives
- Hazard Symbols: Not available.
- Risk Phrases: Not available.
- Safety Phrases: Not available.

WGK (Water Danger/Protection)
- CAS# 7782-42-5: 0
- CAS# 14808-60-7: No information available.

United Kingdom Occupational Exposure Limits
- CAS# 7782-42-5: OES-United Kingdom, TWA total inhalable dust: 10 mg/m3 TWA; respirable dust: 4 mg/m3 TWA

Canada
- CAS# 7782-42-5 is listed on Canada's DSL List.
- CAS# 14808-60-7 is listed on Canada's DSL List.
- This product has a WHMIS classification of D2A.
CAS# 7782-42-5 is not listed on Canada's Ingredient Disclosure List.  
CAS# 14808-60-7 is listed on Canada's Ingredient Disclosure List.

Exposure Limits
CAS# 7782-42-5: OEL-AUSTRALIA: TWA 10 mg/m^3  
OEL-BELGIUM: TWA 10 mg/m^3  
OEL-BELGIUM: TWA 2.5 mg/m^3  
OEL-FINLAND: TWA 5 mg/m^3  
OEL-FRANCE: TWA 10 mg/m^3  
OEL-GERMANY: TWA 6 mg/m^3  
OEL-THE NETHERLANDS: TWA 10 mg/m^3  
OEL-THE NETHERLANDS: TWA 2.5 mg/m^3  
OEL-POLAND: TWA 2 mg/m^3  
OEL-SWEDEN: TWA 5 mg/m^3  
OEL-SWITZERLAND: TWA 2.5 mg/m^3  
OEL-UNITED KINGDOM: TWA 10 mg/m^3  
OEL-UNITED KINGDOM: TWA 5 mg/m^3  
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV  
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV  

CAS# 14808-60-7: OEL-BELGIUM: TWA 0.1 mg/m^3  
OEL-DENMARK: TWA 0.1 mg/m^3  
OEL-FINLAND: TWA 0.2 mg/m^3  
OEL-GERMANY: TWA 0.15 mg/m^3  
OEL-RUSSIA: STEL 14 mg/m^3  
OEL-SWEDEN: TWA 0.1 mg/m^3  
OEL-SWITZERLAND: TWA 0.15 mg/m^3  
OEL-THAILAND: TWA 10 mg/m^3 (resp. dust)  
OEL-THAILAND: TWA 30 mg/m^3 (total dust)  
OEL-UNITED KINGDOM: TWA 0.1 mg/m^3 (resp. dust)  
OEL-UNITED KINGDOM: TWA 0.3 mg/m^3 (total dust)  
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV  
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV  

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 12/12/1997 Revision #2 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

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