***Material Safety Data Sheet***

(Complies with 29 CFR 1910.1200)

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| **Section I** |
| Manufacturer | Carlisle Brake and Friction 920 Lake Rd. Medina, Ohio 44256 |
| Emergency Phone . | 330-725-4941 | Effective Date | July 15, 2009 |
| Chemical Name | Friction Material | Revision Date | March 30, 2011 |
| Tradename | Sintered Friction Material |
| Category | Inorganic—18H14 |  |

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| **Section II - Hazardous Ingredients / Identity** |
| Component | OSHA-PEL (mg/m3) | ACGIH-TLV (mg/m3) | % | CAS No. |
| Copper | 1.0 | 1.0 | Proprietary | 7440-50-8 |
| Tin | 2.0 | 2.0 | Proprietary | 7440-31-5 |
| Iron | Total=15.0 Resp.= 5.0 | 10.0 | Proprietary | 7439-89-6 |
| Lead | 0.05 | 0.15 | Proprietary | 7439-92-1 |
| Silicon dioxide | 0.1\* (Respirable fraction) | 0.1\* | Proprietary | 1348-42-2 |
| Carbon | Total = 15.0 Resp.= 5.0 | 10.0 | Proprietary | 7782-42-5 |
| Molybdenum disulfide | 15.0 | 10.0 | Proprietary | 1317-33-5 |
| Boron nitride | N /A | 5.0 | Proprietary |  |
| **Section III - Physical Characteristics** |
| Boiling Point | Lead 3137 F | Sp.Gr. (H2O=1) | Lead 11.3gm/cc |
| Vapor Press (mm Hg) | N/A | Solubility in Water | N/A |
| Reactivity in Water | N/A | Vapor Density (Air=1) | N/A |
| Melting Point | N/A | Color | Copper color |
| Appearance/Odor | No Odor |  |  |

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| **Section IV - Fire and Explosion Data** |
| Flashpoint | N/A | Method used | N/A |
| Flammable Limits (LEL/UEL) | N/A | Special Fire Fighting Procedure | None |
| Auto Ignition Temperature | N/A | Extinguishing Media | Dry chemical, graphite, dolomite, NaCl |
| Unusual Fire and Explosion Hazards | Powdered lead is listed as weakly explosive in U.S. Bureau of Mines Report F1-6516. Ignition temp. For layers is 210-460C. |

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| **Section V - Reactivity Data** |
| Stability | Stable |
| Incompatibility ( Materials to Avoid) | Strong oxidizing agents |
| Hazardous Decomposition Products | Nitrogen oxide if reacted with nitric acid. |
| Hazardous Polymerization | Will Not Occur |
| Conditions to Avoid | None |

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| **Section VI - Health Hazards** |

**Effects of Overexposure:**

Inhalation: a) Inhalation of high concentrations of copper dust may cause intense sneezing, nausia, weakness and fever. Can cause hemolysis of red blood cells, deposition of hemofuscin in the liver and possible injury to lung cells.

 b) Tin can cause neurologic disturbances including tremors and flaccid paralysis. Exposure to dust and fumes of tin oxide causes a mild pneumoconiosis.

 c) Iron can cause coughing, slight upper respiratory irritation, and a metallic taste in the mouth.

 d) Lead can cause sperm malformation, central nervous system disorders, peripheral neuropathy, gastro intestinal disturbances, kidney damage and anemia. Lead exposure has been reported to reduce mental ability and has been linked to birth defects. Lead is listed by IARC as Group 2B, possibly carcinogenic to humans and is also listed as a carcinogen by the EPA.

 e) Exposure to respirable crystalline quartz may cause delayed (chronic) lung disease (silicosis); acute or rapidly developing silicosis may occur in a short period of time in heavy exposure. Silicosis is a form of disabling pulmonary fibrosis which can be progressive and may lead to death. Crystalline quartz is listed by the IARC as a Group 2A (known carcinogen); and determined by the NTP as an anticipated human carcinogen.

 f) Chronic exposure to carbon as graphite dust can cause fibrosis, emphysema and corpulmonale.

Skin: Repeated exposure to copper (as salts) may cause dermatitis. Aluminum oxide may cause skin abrasions.

Eye: Copper may cause conjunctivitis or ulceration and turbidity of the cornea.

**Emergency Procedures**

Eye Contact: In case of contact, immediately flush with water for 15 minutes, including under the eyelids. Seek medical help immediately if material cannot be adequately removed from the eye.

Skin Contact: Wash thoroughly with soap and water.

Inhalation: Following exposure to a large amount of dust, remove from exposure. If breathing has stopped, perform artificial respiration. Contact a physician.

Ingestion: Under normal conditions of industrial use, ingestion is not expected to occur. Should ingestion occur, substantial lead exposure could result. (see inhalation). Get medical attention.

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| .**Section VII - Spill/Leak Procedures** |
| Handling, Storage | None applicable |
| DOT Shipping Rules | Non-hazardous as "article", no special precautions |
| Spill/Leak | Broom, Scoop, Vacuum. Avoid dusting. Wear respirator. |
| Waste Disposal Methods | Check with local counsel for applicable laws/regulations.  |

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| **Section VIII - Special Protection /Control Measures** |
| Respiratory Protection/Ventilation | Use a NIOSH approved respirator with appropriate filters when exposed to brake wear products. Use exhaust ventilation to keep exposure below exposure limits. |
| Protective Gloves | Recommended, particularly if sensitive skin. |
| Eye Protection | Recommended |
| Other Protective Equipment | Long sleeve shirts |

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| **Section IX - Special Precautions** |
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| **Disclaimer**The information contained herein is based on data available at this time and is believed to be accurate. No warranty, however, is expressed or implied in no event will Carlisle Brake and Friction be liable for incidental or consequential damages of any kind regarding the accuracy of this data or the results to be obtained from the use thereof. Since information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar, no responsibility is assumed for the results of its use. The person receiving this information should make his own determination of the suitability of the material for his particular purpose. |