FEDERAL MOGUL

# MATERIAL SAFETY DATA SHEET

## SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

**Product Name: Friction Material, Brake Lining**

**Product Number: No. 0209**

FA903, FA904, FA906, FA908, FA910, FA912, FA914, FA916, DEX101, DEX103

**Manufacturer:**
Federal Mogul Corporation
26555 Northwestern Highway
Southfield, MI 48033
**24hr Emerg # (Infotrac): 1-800-535-5053**
**International: 001-352-323-3500**
**Non-Emerg #: 248-354-9844**

## SECTION 2: COMPOSITION/INFORMATION ON HAZARDOUS INGREDIENTS

Although several of the ingredients used to formulate this product may be hazardous in their raw state, the manufacturing process results in a solid, infusible form, binding or otherwise rendering the mixture inert. We have identified below those hazardous constituents present in quantities greater than 1% (0.1% for carcinogens) that may be released from the product by overheating, burning, machining, or abrading.

| Ingredient* | CAS No.: | % Weight | OSHA PEL | ACGIH TLV (2004) |
|---|---|---|---|---|
| Fused Alumina | 1344-28-1 | >1 | 15 mg/m$^3$ [a,b] | 10 mg/m$^3$ |
| Barytes | 7727-43-7 | >1 | 15 mg/m$^3$ [b] | 10 mg/m$^3$ |
| Calcium carbonate (limestone) | 1317-65-3 | >1 | 15 mg/m$^3$ [b] | 10 mg/m$^3$ |
| Calcium hydroxide (hydrated lime) | 1305-62-0 | >1 | 15 mg/m$^3$ [b] | 5 mg/m$^3$ |
| Carbon black | 1333-86-4 | >1 | 3.5 mg/m$^3$ | 3.5 mg/m$^3$ (A4) |
| Cashew Resin – Cured | 69012-00-6 | >1 | None Established | None Established |
| Cellulose | 9004-34-6 | >1 | 15 mg/m$^3$ [b] | 10 mg/m$^3$ |
| Ceramic | 8031-18-3 | >1 | None Established | None Established |
| Coal, sea | 68409-95-0 | >1 | None Established | None Established |
| Coke (petroleum) | 64743-05-1 | >1 | None Established | None Established |
| Graphite | 7782-42-5 | >1 | 15 mppcf [c] | 2 mg/m$^3$ (respirable fraction) |
| Kevlar | 26125-61-1 | >1 | None Established | None Established |
| HYCAR | 9003-18-3 | >1 | None Established | None Established |
| Linseed oil – 100% solids | 67746-08-1 | >1 | None Established | None Established |
| Mineral Fibers (glass) | 65997-17-3 | >1 | 1 fiber/cc [d] | 1 fiber/cc [d] (A3) |
| Mineral Fiber (Biosoluble) | 194718-72-4 | >1 | None Established | None Established |
| PAN | 24980-62-9 | >1 | None Established | None Established |
| Steel Fiber | 65997-19-5 | >1 | None Established | None Established |
| Sulfur | 7704-34-9 | >1 | None Established | None Established |
| Wollastonite | 13983-17-0 | >1 | None Established | None Established |

*: The products listed in Section 1 do not contain all of the ingredients listed above
d: As synthetic vitreous fibers per cubic centimeter of sampled air
a: Milligrams of compound per cubic meter of sampled air, on a weight-to-volume basis
b: As total particulate (not otherwise regulated)
A4: ACGIH has classified the compound as not classifiable as a human carcinogen
c: Millions of particles per cubic foot of sampled air
A3: ACGIH has classified this compound as a confirmed animal carcinogen with unknown relevance to humans

OSHA Regulatory Status: This product is classified as hazardous under OSHA regulations.

## SECTION 3: HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW

Shipped friction materials are not considered hazardous, but operations (overheating, burning, machining, abrading, or riveting) that can create airborne dust should be avoided. Such operations could cause exposures in excess of permissible exposure limits for the respective ingredients and should be considered hazardous.

## SECTION 3: HAZARDS IDENTIFICATION (continued)

### POTENTIAL HEALTH EFFECTS

**Inhalation:** Dust may cause irritation, coughing, shortness of breath. Repeated inhalation of dust may affect a variety of organs (See Chronic Section below).

**Skin**: May cause irritation. Prolonged skin contact may cause skin sensitization and/or dermatitis.

**Eye:** Dust may cause irritation and redness. Particles may scratch the eye.

**Ingestion:** Ingestion may cause irritation, nausea, vomiting, and diarrhea.

**Chronic:** Repeated inhalation of dust may cause fibrotic lung disease, decreased breathing capacity, and increased risk of sinus and respiratory cancer. Long-term dust inhalation may also harm the nervous, gastrointestinal, renal (kidneys), and hematological (blood) systems.

**Carcinogenicity:**

| COMPONENT | NTP | IARC | OSHA |
|---|---|---|---|
| Mineral Fibers (special purpose glass fibers) | No | 2B | No |
| Carbon black | No | 2B | No |
| Ceramic Fibers | B | 2B | No |
| Alumina, Barytes, Brass, Calcium carbonate (limestone), Calcium hydroxide, Cashew Resin-Cured, Cellulose, Coal, Coke, Graphite, Kevlar, Hycar, Linseed Oil, Mineral fiber (biosoluble*) PAN, Steel Fiber, Sulfur, Wollasonite | No | No | No |

***** The mineral fiber used has been classified as biosoluble and exonerated under ECC directive 97/69/EC, Note Q. The IARC has recently changed the classification of Mineral Fibers to Group 3 “unclassifiable” from Group 2 “possible carcinogen.”

**Signs and Symptoms:** Skin may become red and itchy with repeated contact. Anemia may cause dizziness and fatigue. Muscle weakness, fatigue, irritability, poor memory, and headache may indicate neurological effects. Gastrointestinal effects may result in nausea, abdominal pain, diarrhea, constipation, nausea and vomiting.

**Medical Conditions Aggravated by Exposure:** Overexposure may aggravate pre-existing skin, respiratory, kidney, blood, gastrointestinal and nervous system disorders.

**Target Organs:** Skin, eyes, lungs, gastrointestinal system.

**POTENTIAL HEALTH EFFECTS**
**Symptoms and Effects of Exposure to Selected Individual Components**

**ALUMINA**
**Inhalation hazards –** Exposure to alumina may cause coughing and shortness of breath.
Chronic: Prolonged exposure may affect breathing capacity.
**Other hazards** – Ingestion is not recommended, but adverse effects have not been reported. Alumina is not absorbed through the skin, but contact may cause abrasion. Dust may irritate eyes.

**BARYTES**
**Inhalation hazards** – Should be treated as a nuisance dust. Exposure to barium sulfate may cause paroxysmal coughing, wheezing, difficult breathing, and upper respiratory tract irritation.
**Other hazards** –Adverse effects have not been reported from ingestion. Eye contact may cause temporary discomfort and irritation.

**CALCIUM CARBONATE**
A white, finely pulverized powder with no odor.
**Inhalation hazards** – Limestone dust is considered a nuisance dust. Prolonged exposure may cause irritation to throat and lungs. Silica content is not considered high enough to cause silicosis unless exposures are extremely high and prolonged.
**Other hazards** – Eyes – may cause mild transient eye irritation.

**CALCIUM HYDROXIDE (HYDRATED LIME)**
**Inhalation hazards** – Dust may cause irritation of nasal and respiratory passages.
**Other hazards** – Lime is a strong eye irritant, and may cause corrosive damage and blindness. Exposure to dust may cause severe skin irritation, drying and burning, particularly to damaged skin. Swallowing excessive amounts may damage mucous membranes and the digestive system. There are no known chronic hazards.

**CARBON BLACK**
**Inhalation hazards** – Should be treated as a nuisance dust. Exposure may cause temporary upper respiratory tract discomfort. IARC classifies carbon black as Group 2, possibly carcinogenic to humans. Proposition 65 lists carbon black as a cancer-causing chemical.

**CASHEW RESIN – CURED**
**Inhalation hazards** – Cured cashew particles are generally considered to be a nuisance dust, but prolonged exposure may cause irritation of nasal and respiratory tracts leading to sensitization. In the unlikely event of formalin vapors and/or uncured cashew liquid being present, this may cause dermatitis and could lead to a form of nasal cancer.

**CELLULOSE**
A non-toxic, fibrous flock, practically odorless.
**Inhalation hazard** – Acute: dryness of nose, eye irritation, and nasal obstruction. Chronic: no data available.

**CERAMIC FIBERS**
**Inhalation hazards** – Overexposure to respirable fibers by inhalation may cause mild and temporary upper respiratory irritation, with discomfort or cough. NTP has listed respirable ceramic fibers as Group B, reasonably anticipated to cause cancer in humans. IARC has listed ceramic fibers as Group 2B, possibly carcinogenic to humans. ACGIH classifies refractory ceramic fibers as A2, a suspected human carcinogen.
**Other hazards** – The mechanical action of fibers may cause slight skin irritation and mild irritation of the eyes and nasal passages. Ingestion may cause gastrointestinal irritation, vomiting, and diarrhea.

**COAL**
**Inhalation hazards** – May irritate mucous membranes by mechanical or chemical means. May cause lung inflammation.
**Other hazards** – May cause slight to moderate eye irritation. May cause skin irritation.

**Symptoms and Effects of Exposure to Selected Individual Components (continued)**

**COKE, CALCINED**
**Inhalation hazards** – May irritate mucous membranes by mechanical or chemical means. May cause lung inflammation.
**Other hazards** – May cause slight to moderate eye irritation. May cause skin irritation.

**HYCAR – ACRYLONITRILE/BUTADIENE POLYMER**
**Inhalation hazards** – May cause respiratory tract irritation.
**Other hazards** – May cause skin or eye irritation.

**GRAPHITE**
**Inhalation hazards –** Acute: exposure may result in cough, dyspnea, black sputum, and fibrosis. Chronic: Prolonged exposure may cause pneumoconiosis. It is reported that diseases of the respiratory and cardiovascular system may be aggravated by exposure.

**KEVLAR – ARAMID FIBER**
**Inhalation hazards –** Overexposure to respirable fibers by inhalation may cause mild temporary upper respiratory irritation, with discomfort or cough. Based on animal testing, prolonged and repeated exposure to excessive concentrations of respirable fibers may cause permanent lung injury.
**Other hazards** – Skin sensitization has not been observed in human tests. The mechanical action of fibers may cause slight skin irritation at clothing points and mild irritation of the eyes and nasal passages.

**LINSEED OIL**
**Inhalation hazard** – No known adverse health effects.
**Other hazards** – Eye contact may cause redness or irritation.

**MAN-MADE MINERAL FIBERS – (SPECIAL PURPOSE GLASS FIBERS)**
**Inhalation hazards** – Exposure to respirable fibers by inhalation may cause temporary upper respiratory irritation, with discomfort and cough. Prolonged exposure may cause chronic lung disease. IARC classifies man-made mineral fibers (diameter <1 μm) as Group 2B, possibly carcinogenic to humans. ACGIH classifies synthetic vitreous fibers as A3, an animal carcinogen with unknown relevance to humans.
**Other hazards** – The mechanical action of fibers may cause skin irritation and irritation of the eyes and nasal passages. Ingestion may cause gastrointestinal irritation, vomiting, and diarrhea.
Note: The emergence of "biosoluble" forms of man-made fibers has allowed these fiber types to be omitted from classification as a carcinogen according to Note Q in EU Commission Directive 97/69/EC.

**PAN – POLYACRYLIC NITRILE**
**Inhalation hazards** – May cause respiratory tract irritation.
**Other hazards** – May cause skin or eye irritation.

**STEEL FIBER**
**Inhalation hazards** – Acute: Metal fume fever with symptoms of chills, fever, cough, muscle aches, and difficulty in breathing from manganese; silicon can cause respiratory tract irritation; copper can cause irritation of eyes, nose, throat and lungs with a possibility of metal fume fever, chills, nausea, fever, dry throat, cough, and metallic taste. Chronic: Repeated exposure to iron over time may cause lung changes and benign pneumoconiosis; cumulative central nervous system and lung damage may occur with manganese as well as insomnia, and malaise; may cause irritation of the lungs and discoloration of the skin and hair.
**Other hazards** – May cause mechanical damage to skin and eyes.

**SULFUR**
**Inhalation hazards** – Exposure may cause irritation to mucous membranes and upper respiratory tract. Symptoms include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.
**Other hazards** – May also irritate by ingestion and skin absorption.

**Symptoms and Effects of Exposure to Selected Individual Components (continued)**

**WOLLASTONITE**
A non-metallic mineral powder, white in color with a faint odor.
**Inhalation hazards** – long-term cumulative inhalation of high concentrations may cause restriction of the large airways.
**Other hazards** – May cause minor skin irritation.

## SECTION 4: FIRST AID MEASURES

| | |
|---|---|
| **Ingestion:** | Seek medical attention. |
| **Inhalation:** | Move to fresh air. Seek medical attention. |
| **Eye Contact:** | Flush with water to remove particulate. Seek medical attention. |
| **Skin Contact:** | Wash thoroughly with soap and water. If persistent irritation develops, seek medical attention. |

## SECTION 5: FIRE FIGHTING MEASURES

**Flashpoint:** N/A **LEL:** N/A **UEL:** N/A **Autoignition Temperature:** This product is inherently flame resistant, but may ignite at temperatures exceeding 1,112°F (600°C) in an oxygen-enriched atmosphere.

**Extinguishing Media:** Use media suitable for surrounding fire.

**Unusual Fire and Explosion Hazards:** None

**Special Fire Fighting Procedures:** Heating to very high temperatures may result in toxic decomposition products (See Section 10).

## SECTION 6: ACCIDENTAL RELEASE MEASURES

If a release of dust occurs during machining, abrading, or riveting, remove dust by vacuuming or wet mopping. Vacuums used for this purpose should be equipped with HEPA filters. Do not use compressed air to blow dust in the workplace.

## SECTION 7: HANDLING AND STORAGE

Store in a dry place. Shipping and storage may result in accumulation of dust in shipping containers. If this occurs, dispose of the container in an airtight polyethylene bag (see disposal instructions below) or remove dust by vacuuming or wet mopping. Vacuums used for this purpose should be equipped with HEPA filters. Do not use compressed air to blow dust from storage containers.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**Ventilation Protection:** Any operation which may produce dust, including machining, grinding, riveting, or abrading this product, should be adequately exhausted to prevent inhalation of dust.

**Respiratory Protection:** Use a NIOSH-approved respirator if there is a potential for exposure to dust, vapor, or fume exceeding PELs or TLVs. (See 29 CFR 1910.134, respiratory protection standard).

**Skin Protection:** If skin irritation occurs, gloves and other protective garments may be worn.

**Eyes:** Wear safety glasses or goggles, as necessary, if dust exposure is possible.

**Other:** None known.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES (as lead)

| | | | |
|---|---|---|---|
| **Boiling Point:** | N/A | **Vapor Pressure:** | N/A |
| **Melting Point:** | N/A | **Vapor Density (air = 1):** | N/A |
| **pH:** | N/A | **% Volatile:** | N/A |
| **Specific Gravity:** | 2.00 – 3.70 g/cc | **Evaporation Rate:** | N/A |
| **Water Solubility:** | Insoluble | **Appearance and Odor:** | Solid, phenolic |

## SECTION 10: STABILITY AND REACTIVITY

**Stability:** Stable at normal temperatures and storage conditions.

**Incompatibility (Materials/Conditions to Avoid):** None.

**Hazardous Polymerization:** Will not polymerize. This product is fully cured in the manufacturing process.

**Decomposition Products:** Oxides of carbon, nitrogen and sulfur; hydrocarbons; ammonia; and other trace organic compounds.

## SECTION 11: TOXICOLOGICAL INFORMATION

**Inhalation:** Refer to Section 3

**Skin**: Refer to Section 3

**Eye:** Refer to Section 3

**Ingestion:** Refer to Section 3

**Acute:** Skin and eye irritation may occur with repeated contact to dust.

**Chronic:** This product is a mixture of chemicals physically bonded together. Therefore, in the "as supplied " state, this product is considered non-hazardous. If dust is generated, some of the ingredients can have acute and chronic effects (See Section 3 for details).

## SECTION 12: ECOLOGICAL INFORMATION

Not Applicable

## SECTION 13: DISPOSAL CONSIDERATIONS

Federal and state law regulates disposal of solid waste. Waste should be placed in airtight containers. Disposal must be in accordance with 49CFR261, 40CFR262, and applicable state and local regulations.

## SECTION 14: TRANSPORTATION INFORMATION

| | |
|---|---|
| **Proper Shipping Name:** | Not regulated by these modes of transportation |
| **Hazard Class:** | None |
| **Identification Number:** | None |
| **Packing Group:** | N/A |
| **Shipping Label:** | None |
| **Additional Marking Requirement:** | None |

## SECTION 15: REGULATORY INFORMATION

**U.S. TSCA:** All chemicals used in the manufacture of this product are listed on the U.S. Toxic Substances Control Act (TSCA) Inventory

**California Proposition 65:** This product contains ingredients known to the State of California to cause cancer, birth defects or other reproductive effects.

**SARA Title III – Section 313 Supplier Notification:** This product does not contain the following chemicals subject to SARA Title III/CERCLA "reportable quantities" (RQs) and/or "threshold planning quantities" (TPQs) and/or are classified as "Toxic Chemicals" under the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and 40 CFR 372.

**RCRA Hazardous Waste Code:** Not Available

**CERCLA Hazardous Substances:** Not Available

**OSHA:** Not Available

**WHMIS Classification:** Not Available

## SECTION 16: OTHER INFORMATION

Abbreviations:

| | |
|---|---|
| CAS #: | Chemical Abstract Services Number |
| OSHA PEL: | U.S. Occupational Safety and Health Administration Permissible Exposure Limits |
| ACGIH TLV: | American Conference of Governmental Industrial Hygienists Threshold Limit Value (2004) |
| fibers/cc: | Fibers per cubic centimeter of sampled air |
| $mg/m^3$: | Milligrams of constituent per cubic meter of sampled air, on a weight-to-volume basis |
| N/A: | Not Applicable |
| NIOSH | National Institute for Occupational Safety and Health |
| IARC: | International Agency for Research on Cancer |
| NTP: | National Toxicology Program |
| HEPA: | High-efficiency particulate air |

***This product does not contain any deliberate addition of asbestos.***

The information provided on this data sheet was abstracted from a supplier MSDS and standard references in occupational health and toxicology. Federal-Mogul makes no representation or warranty with respect to the information obtained from such references. The information provided is, however, as of the date below, true and accurate to the best of Federal-Mogul's knowledge.