



MATERIAL SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: Friction Material, Lining

Manufacturer:

Federal-Mogul Corporation
26555 Northwestern Highway
Southfield, MI 48034

Product Number: No. 252 720R, 916-46Q2, 916-46Q3, 916-46Q3B, 1001-49, 1001-49A, 1132-36, 1150-22, 1222-1A, **1155-155, 1155-169, 1155-176, 1162-15, 1259-28C, 1272-15, 3030-158S, 3030-197, 3030-212, 3059-91, 3059-91A, 3059-100, 3059-100A, 3079-10, 3086-65, 3086-65A, 3100-7A, 3148-9B, 3148-10B, 3100-7A, Abex 682GG, Abex 6006EE, Abex 6022EE, Abex 6051EE, Abex 6091EE, B 369, BRSD2002, BRSD2004, BRSD2005, FA-003, FA-401, FA-402, FA-404, FA-804, FA-903, FA-904, FA-906, FA-908, FA-914, FA-916, FA-4001, FA-4001A, FA-4004, FER 3612F, FER 3154, FER 4661, FM-2123, FM-2159, FM-2170, FM-2176, FM-2244, FM-4112, MPV2000, MPV2001, MPV2002, MPV2012, MX, NA-27, NA-27A, TS 0112**

Corporate Phone: (248) 354-9844

Emergency Phone: 1-800-56-SPILL
(1-800-567-7455) 24-Hr

SECTION 2: COMPOSITION/INFORMATION ON ALL INGREDIENTS

Although some 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 all constituents present in quantities greater than 1% (0.1% for carcinogens) that may be released from the product by overheating, burning, machining, or abrading.

The formulations listed in Section 1 do not contain all of the ingredients listed below.

<u>Ingredient</u>	<u>CAS No.:</u>	<u>% Weight</u>	<u>OSHA PEL</u>	<u>ACGIH TLV (2005)</u>
Acrylic fibers (P.A.N. dia.>9 microns)	24980-62-9	>0.1	None Established	1 fiber/cc*
Aramid fiber (dia. >9 microns)	26125-61-1	>1	None Established	1 fiber/cc*
Barium sulfate	7727-43-7	>1	15 mg/m ³ (total particulate)	10 mg/m ³
Calcium Fluoride	7789-75-5	< 0.5	None Established	None Established
Calcium Oxide	1305-78-8	>1	5 mg/m ³	2 mg/m ³
Calgon (Sodium hexametaphosphate)	68915-31-1	>1	None Established	None Established
Carbon (purified)	7440-44-0	>1	None Established	None Established
Cashew resin – cured	8007-24-7	>1	None Established	None Established
Cashew resin – cured	68333-96-0	<1	None Established	None Established
Cashew particle	68333-94-8	<1	None Established	None Established
Cashew particle	68647-81-4	<1	None Established	None Established
Cashew particle	69012-00-6	<0.5	None Established	None Established
Coal (as Anthracite)	68409-95-0	<2	2.4 mg/m ³	0.4 mg/m ³ (respirable fraction)
Coke (petroleum)	64743-05-1	>1	None Established	None Established
Graphite (natural)	7782-42-5	>1	15 mppcf	2 mg/m ³ (respirable fraction)
Hydrated lime (Calcium hydroxide)	1305-62-0	<2	15 mg/ m ³ (total particulate)	5 mg/m ³
Iron powder (as iron)	7439-89-6	>1	None Established	None Established
Kyanite	1302-76-7	<1	None Established	None Established
Magnesium Oxide	1309-48-4	>1	15 mg/ m ³ (total particulate)	10 mg/ m ³ (inhalable particulate)
Molybdenum sulfide	1317-33-5	<0.5	None Established	None Established
Mullite	1302-93-8	>0.01	None Established	None Established
Nitrile rubber	9003-18-3	>1	None Established	None Established
Polybenzimidazole fiber (dia. >8 microns)	70955-78-1	<0.5	None Established	None Established
Phenolic resin-cured	9003-35-4	>1	None Established	None Established
Rubber (powdered)	9006-04-6	>1	None Established	None Established
SBR Rubber	9003-55-8	<0.5	None Established	None Established
Steel fiber	65997-19-5	>1	None Established	None Established
Titanium Dioxide (non fibrous)	1317-80-2	<0.5	15 mg/m ³ (total particulate)	10 mg/ m ³ (total particulate)

Trace impurities not listed may appear in Section 15

* As synthetic vitreous fibers per cubic centimeter of sampled air

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 ingredient and should be considered hazardous.

POTENTIAL HEALTH EFFECTS

Inhalation: Dust may cause irritation. Fume produced at high temperatures may cause metal fume fever, a 24-to 48-hour "flu-like" illness. Repeated inhalation of dust over time 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 over time may cause fibrotic lung disease 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
Acrylic fiber, Aramid Fiber, Titanium dioxide (non fibrous)	No	3	No
Barium sulfate, Calcium fluoride, Calcium oxide, Calgon (sodium hexametaphosphate), Carbon (purified), Cashew Resin-Cured, Coal, Coke, Graphite, Hydrated Lime, Iron Powder, Kyanite, Mullite, Nitrile rubber, Phenolic Resin-cured, Rubber (powdered), SBR rubber, Steel fiber, Zinc	No	No	No

Symptoms and Effects of Exposure to Selected Individual Components

ACRYLIC FIBERS (P.A.N. Fibers) (> 9 microns in diameter, considered non-respirable)

Inhalation hazard(s) – Overexposure to respirable fibers by inhalation may cause mild and temporary upper respiratory irritation, with discomfort or cough. The toxicological properties of this material have not been fully investigated. The oral and dermal animal testing LD₅₀ values were greater than 5.0 g/kg and 2.0 g/kg, respectively.

Other hazard(s) – Skin sensitization has not been observed in human tests. The mechanical action of fibers may cause slight skin irritation at clothing binding points and mild irritation of the eyes and nasal passages.

ARAMID FIBERS (> 9 microns in diameter, considered non-respirable)

Inhalation hazard(s) – 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 hazard(s) – 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.

BARIUM SULFATE

Inhalation hazard(s) – Should be treated as a nuisance dust. Exposure to barium sulfate may cause paroxysmal coughing, wheezing, difficult breathing, and upper respiratory tract irritation.

Other hazard(s) – Adverse effects have not been reported from ingestion. Eye contact may cause temporary discomfort and irritation.

Symptoms and Effects of Exposure to Selected Individual Components

CALCIUM FLUORIDE

Inhalation hazard(s) – Toxic effects are not reported, but exposure to dust may cause coughing and respiratory tract irritation.

Other hazard(s) – Contact may cause eye irritation Long-term fluoride exposure can cause fluorosis with bone degeneration and teeth mottling.

CALCIUM OXIDE

Inhalation hazards – Inhalation of dust causes irritation and inflammation to mucous membranes and respiratory passages.

Other hazards – Large doses taken internally cause nausea, vomiting and acidosis. May cause burns to mouth and stomach. Severe irritation to eyes, nose, and moist skin.

CALGON (SODIUM HEXAMETAPHOSPHATE)

Inhalation hazard(s) – Exposure to fine dust may cause mild irritation of respiratory tract.

Other hazard(s) – Prolonged exposure may cause mild transient eye or skin irritation. Material is non-hazardous, and is considered a nuisance dust.

CASHEW RESIN – CURED, CASHEW PARTICLE

Inhalation hazard(s) – 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 formaldehyde vapors and/or uncured cashew liquid being present, this may cause dermatitis and could lead to a form of nasal cancer.

COAL

Inhalation hazard(s) – May irritate mucous membranes by mechanical or chemical means. May contain up to 5% crystalline silica (quartz). See Silica hazards below.

Other hazard(s) – May cause slight to moderate eye irritation. May cause skin irritation.

COKE, CALCINED

Inhalation hazard(s) – May irritate mucous membranes by mechanical or chemical means. May cause lung inflammation.

Other hazard(s) – May cause slight to moderate eye irritation. May cause skin irritation.

GRAPHITE

Inhalation hazard(s) – 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.

HYDRATED LIME

Inhalation hazard(s) – Dust may cause irritation of nasal and respiratory passages.

Other hazard(s) – Lime is a strong eye irritant, and may cause corrosive damage and blindness. Exposure To dust may cause severe shin irritation, drying and burning, particularly with damaged skin. Swallowing excessive amounts may damage mucous membranes and the digestive system. There are no known chronic hazards.

IRON DUST

Inhalation hazard(s) – Repeated or prolonged exposures to iron may cause a form of benign pneumoconiosis called siderosis. Exposure is not generally associated with pulmonary fibrosis or disability unless there is concurrent exposure to other fibrosis-producing materials such as silica.

Other hazard(s) – Contact may cause skin and eye irritation.

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

KYANITE

Naturally occurring mullite with trace amounts of crystalline silica. Long term exposure may aggravate pre-existing respiratory conditions and may cause pneumoconiosis (kaolinosiis).

Inhalation hazard(s) – Dusts may cause irritation of nasal and respiratory tracts.

Other hazard(s) – May irritate eyes and abrade the skin.

MAGNESIUM OXIDE

Inhalation hazard(s) – Dusts may cause irritation of nasal and respiratory tracts.

Other hazard(s) – Overexposure may result in eye, skin or respiratory irritation over a long period of time.

MOLYBDENUM SULFIDE

Inhalation hazard(s) – Causes lung irritation, chest pain, difficult breathing and coughing.

Other hazard(s) – Nausea, stomach irritation, vomiting and minor irritation to skin. Can cause abrasive damage to outer eye surface.

MULLITE

Man made refractory, having stiochiometric composition $3\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$. see Kyanite (above)

NITRILE RUBBER

Inhalation hazard(s) - Gases and fumes from decomposition of this product may cause irritation of respiratory tract, skin, and eyes.

Other hazard(s) – Eyes – may cause eye irritation if material is introduced into the eye. Eyes may feel scratchy, become red, and tear.

PHENOLIC RESIN – CURED

Inhalation hazard(s) – Dust may cause irritation of nasal and respiratory tracts. Product is fully cured, so formaldehyde vapor should not be present. If formaldehyde was present, inhalation may cause a form of nasal cancer.

Other hazard(s) – Prolonged exposure can cause irritation, redness, tearing of the eyes, and may lead to sensitization of the skin and dermatitis.

RUBBER (POWDERED)

Inhalation hazard(s) – May cause mild irritation of the respiratory tract. Repeated and prolonged inhalation of dust may lead to a benign pneumoconiosis. This condition may cause some lung function impairment, but is reversible with reduced exposure.

Other hazard(s) – May cause mild transient eye irritation.

SILICA, Quartz

Inhalation hazard(s) – Acute: Exposure to silica dust may cause paroxysmal coughing, wheezing, dyspnea and upper respiratory tract irritation. Chronic: Prolonged exposure to silica dust may cause silicosis.

Crystalline silica has been classified by IARC as, Group 1, carcinogenic to humans. ACGIH classifies crystalline silica as A2, suspected human carcinogen.

Other hazard(s) – Eye or skin contact can cause temporary discomfort and irritation.

STEEL FIBER

Inhalation hazard(s) – Acute: Metal fume fever with symptoms of chills, fever, cough, muscle aches, and difficulty in breathing 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 hazard(s) – May cause mechanical damage to skin and eyes.

Symptoms and Effects of Exposure to Selected Individual Components (continued)**TITANIUM DIOXIDE (non fibrous only)**

Inhalation hazard(s) – May cause irritation of the respiratory system. Extreme exposures have been reported to lead to granulomatous lesions.

Other hazard(s) – Causes irritation to the eyes and skin. Considered a potential occupational carcinogen by NIOSH, but the IARC considers titanium dioxide to be Group 3, unclassifiable.

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:	2.8 – 3.5 g/cc	Evaporation Rate:	N/A
Water Solubility:	Insoluble	Appearance and Odor:	Grey or black solid with phenolic odor

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

SECTION 12: ECOLOGICAL INFORMATION

Not available.

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
Hazard Class:	N/A
Identification Number:	N/A
Packing Group:	N/A
Shipping Label:	None
Additional Marking Requirement:	None

SECTION 15: REGULATORY INFORMATION
<p>U.S. TSCA: All chemicals used in the manufacture of this product are listed on the U.S. Toxic Substances Control Act (TSCA) Inventory.</p> <p>California Proposition 65: This product may contain silica, an ingredient known to the State of California to cause cancer.</p> <p>SARA Title III – Section 313 Supplier Notification: N/A</p> <p>RCRA Hazardous Waste Code: N/A</p> <p>CERCLA Hazardous Substances: N/A</p> <p>OSHA: OSHA has not developed standards other than PELs specific to its constituents.</p> <p>WHMIS Classification: Not Available</p>

SECTION 16: OTHER INFORMATION
<p>Abbreviations:</p> <p>CAS No.: Chemical Abstract Services Number</p> <p>OSHA PEL: U.S. Occupational Safety and Health Administration Permissible Exposure Limits</p> <p>ACGIH TLV: American Conference of Governmental Industrial Hygienists Threshold Limit Value (2005)</p> <p>fibers/cc: Fibers per cubic centimeter of sampled air</p> <p>mg/m³: Milligrams of contaminant per cubic meter of sampled air, on a weight-to-volume basis</p> <p>mppcf: Millions of particles per cubic foot of sampled air</p> <p>N/A: Not Applicable</p> <p>NIOSH: National Institute for Occupational Safety and Health</p> <p>IARC: International Agency for Research on Cancer</p> <p>NTP: National Toxicology Program</p> <p>HEPA: High-efficiency particulate air</p>

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.