



MATERIAL SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: OE Formulations (Disc & Drum) MSDS Number: No. 0238 1001-49, 1143-301, 1143-320M, 1150-22, 1222-1A, 1259-28C, 20PD, 30PD, 3042-11S, 3042-43S, 3100-7A, 3148-9A, 3148-9B, 3148-10B, 720R, 884, 916-46Q2, 916-46Q3, 916-46Q3B, AO44, FA-003, FA-804, FER-3638, FER-4088, FER-4088F, FER 4109, FER-4181, FER-4200, FER-4364, FM-2109, FM-2123, FM-2129, FM-2136, FM-2136A, FM-2136CH, FM-2154, FM-2155, FM-2159, FM-2160, FM-2170, FM-2176, FM-2211, FM-2234, FM-2244, FM-3000, FM-4112, HP12, KC80, L884, MX4200, NT-4, NU0100US	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
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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 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)
Acrylic Fibers	24980-62-9	>1	None Established	1 fiber/cc ^a
Aluminum	7429-90-5	>1	15 mg/m ³ c, d	10 mg/m ³
Alumina silicate	1335-30-4	>1	None Established	None Established
Aluminum oxide	1344-28-1	>1	15 mg/m ³ d	10 mg/m ³
Antimony sulfide	1345-04-6	>1	None Established	None Established
Aramid Fiber	26125-61-1	>1	1 fiber/cc ^a	1 fiber/cc ^a
Aramid Fiber	24938-64-5	>1	1 fiber/cc ^a	1 fiber/cc ^a
Asphaltum	12002-43-6	>1	None Established	None Established
Barium sulfate	7727-43-7	>1	15 mg/m ³ c	10 mg/m ³
Bismuth sulfide	1345-07-9	>1	None Established	None Established
Brass	NONE	>1	None Established	None Established
Bronze	12597-70-5	>1	None Established	None Established
Butylacrylate (n-)	141-32-2	>1	None Established	2 ppm ^b
Calcium fluoride	7789-75-5	>1	None Established	None Established
Calcium hydroxide (hydrated lime)	1305-62-0	>1	15 mg/m ³ d	5 mg/m ³
Calcium oxide	1305-78-8	>1	5 mg/m ³	2 mg/m ³
Cashew Resin – Cured	68333-94-8	>1	None Established	None Established
Cashew Resin – Cured	68583-07-3	>1	None Established	None Established
Cashew Resin – Cured	68583-06-2	>1	None Established	None Established
Cashew Resin – Cured	68602-89-1	>1	None Established	None Established
Cashew Resin – Cured	68413-25-2	>1	None Established	None Established
Cashew Resin – Cured	68647-81-4	>1	None Established	None Established
Copper (dust & fiber)	7440-50-8	>1	1 mg/m ³	1 mg/m ³
Copper sulfide	22205-45-4	>1	None Established	None Established
Glass Fiber	65997-17-3	>1	None Established	1 fiber/cc ^a (A3)
Graphite	7782-42-5	>1	15 mppcf ^e	2 mg/m ³ (respirable fraction)
Iron Oxide (as dust)	1309-37-1	>1	15 mg/m ³ c	10 mg/m ³
Iron Oxide (as dust)	1332-37-2	>1	None Established	None Established
Iron Powder (as Iron)	7439-89-6	>1	None Established	None Established
Iron Pyrite (as Iron)	1317-37-9	>1	None Established	None Established
Kyanite	1302-76-7	>1	None Established	None Established

SECTION 2: COMPOSITION/INFORMATION ON HAZARDOUS INGREDIENTS (continued)

Limestone	1317-65-3	>1	None Established	None Established
Magnesium oxide	1309-48-4	>1	10 mg/m ^{3d}	10 mg/m ³
Mica	12001-26-2	>1	20 mppcf, <1% silica	3 mg/m ³ (respirable fraction)
Mineral Fibers (Biosoluble)	65997-17-3	>1	None Established	1 fiber/cc ^a
Mineral Fiber (Biosoluble)	287922-11-6	>1	None Established	None Established
Molybdenum sulfide	1317-33-5	>1	None Established	10 mg/m ³
Mullite	1302-93-8	>1	None Established	None Established
Mullite	7631-86-9	>1	None Established	None Established
Nitrile Rubber	9003-18-3	>1	None Established	None Established
Petroleum Coke	64743-05-1	>1	None Established	None Established
Phenolic Resin-Cured	9003-35-4	>1	None Established	None Established
Polybenzimidazole fiber	709955-78-1	>1	None Established	None Established
Potassium titanate	13463-67-7	>1	None Established	None Established
Potassium titanate	12136-45-7	>1	None Established	None Established
Potassium titanate	39290-90-9	>1	None Established	None Established
Potassium titanate	12056-51-8	>1	None Established	None Established
Rubber (Powdered)	9006-04-6	>1	None Established	None Established
Silicon carbide	409-21-2	>1	15 mg/m ^{3c}	None Established
Silicone compounds	14962700-515	>1	None Established	None Established
Sodium hexametaphosphate	10124-56-8	>1	None Established	None Established
Steel Fiber	65997-19-5	>1	None Established	None Established
Sulfur	7704-34-9	>1	None Established	None Established
Tin	7440-31-5	>1	2 mg/m ³	2 mg/m ³
Tin sulfide (stannous)	1314-95-0	>1	None Established	None Established
Tin sulfide (stannic)	1315-01-1	>1	None Established	None Established
Tire Peels (rubber)	9006-04-6	>1	None Established	None Established
Tire Peels (reclaimed rubber)	139497-04-4	>1	None Established	None Established
Titanium dioxide	13463-97-7	>1	15 mg/m ³ (total dust)	10 mg/m ³
Vermiculite	1318-00-9	>1	None Established	None Established
Wollastonite	13983-17-0	>1	None Established	None Established
Zinc (Metal and Powder)	7440-66-6	>1	None Established	None Established
Zirconium hydroxide	14475-63-9	>1	5 mg/m ³ (as zirconium)	5 mg/m ³ (as zirconium)
Zirconium oxide	1314-23-4	>1	5 mg/m ³ (as zirconium)	5 mg/m ³ (as zirconium)
Zirconium silicate (Zirconite)	14940-68-2	>1	5 mg/m ³ (as zirconium)	5 mg/m ³ (as zirconium)

***: The products listed in Section 1 do not contain all of the ingredients listed above**^a: As synthetic vitreous fibers per cubic centimeter of sampled air^b: Parts of constituent per million parts of sampled air, on a volume-to-volume basis.^c: Milligrams of constituent per cubic meter of sampled air, on a weight-to-volume basis^d: As total particulate (not otherwise regulated)

A3: ACGIH has classified the compound as a confirmed animal carcinogen with unknown relevance to humans.

^e: Millions of particles per cubic foot of sampled air

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, or abrading) 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. Fume produced at high temperatures may cause metal fume fever, a 24-to 48-hour “flu-like” illness. 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 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 Wool/Fiber*	Yes
	3*
	No
Acrylic Fiber, Aramid Fiber, Antimony sulfide, n-Butyl acrylate, Glass Fiber, Titanium dioxide	No
	3
	No
Aluminum, Aluminum oxide, Alumina silicate, Asphaltum, Barium sulfate, Bismuth sulfide, Brass, Bronze, Calcium fluoride, Calcium hydroxide, Calcium oxide, Cashew Resin-Cured, Copper, Graphite, Iron oxide, Iron powder, Iron pyrite, Kyanite, Limestone, Magnesium oxide, Mica, Molybdenum sulfide, Mullite, Nitrile Rubber, Petroleum coke, Phenolic Resin-cured, Polybenzimidazole fiber, Potassium titanate, Rubber (Powdered), Silicon carbide, Silicone compounds, Sodium hexametaphosphate, Steel Fiber, Sulfur, Tin, Tin sulfides, Tire peels (rubber), Vermiculite, Wollastonite, Zinc metal, Zinc powder, Zirconium compounds	
	No
	No
	No

- * The mineral fibers used have 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. Metal fume fever is characterized by chills, fever, muscle aches, and metallic taste. 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 (continued)
Symptoms and Effects of Exposure to Selected Individual Components

ACRYLIC FIBERS

Inhalation hazards – 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 hazards – 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.

ALUMINA SILICATE

Inhalation hazards – Exposure may cause eye, nose, throat, lung, and skin irritation. Excessive exposure may cause emphysema and bronchitis.

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.

ALUMINUM OXIDE

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.

ANTIMONY COMPOUNDS

Inhalation hazards – There are no reported serious health risks from exposure other than a possible change in blood pressure. Prolonged exposure may cause irritation of the nose, throat, and mouth.

Other hazards – Skin or eye contact may result in coughing, dizziness, headache, nausea, vomiting, diarrhea, stomach cramps, and insomnia.

ARAMID FIBERS

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.

ASPHALTUM

Inhalation hazards – Acute overexposure may cause respiratory irritation, including coughing or breathing difficulty.

Other hazards – May be a severe digestive system irritant.

BARIUM SULFATE

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.

BISMUTH SULFIDE

Inhalation hazards – May cause irritation.

Other hazards – Ingestion - Bismuth salts are poorly absorbed. Should absorption occur, symptoms may include loss of appetite, headache, skin rashes, kidney damage and mild jaundice. Repeated or prolonged ingestion may cause a "bismuth line", black spots on gum, foul breath and salivation. Skin - May cause reactions and dermatitis. Eyes - May cause irritation.

Symptoms and Effects of Exposure to Selected Individual Components (continued)
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BRASS, BRONZE, AND COPPER

Inhalation hazards – Acute: may produce irritation of the nose and/or trachea. May produce acute gastroenteric symptoms resulting in vomiting or inflammation and may cause metal fume fever.

Chronic: prolonged exposure may cause injury to liver, kidneys or spleen; anemia may develop.

Chronic toxicity is reportedly confined to those persons suffering from pre-existing Wilson's disease.

Other hazards – Copper dusts and mists are eye and mucous membrane irritants may be skin sensitizers.

Acute exposure may cause metallic taste and nasal ulceration and perforation. Prolonged skin contact may produce sensitization dermatitis. Exposure may result in discoloration of the skin and hair. Ingestion of copper compounds may cause vomiting and collapse. Hemolysis, jaundice, anuria, hypertension and convulsions characterize acute poisoning.

BUTYLACRYLATE

Inhalation hazards – May cause upper respiratory irritation.

Other hazards – May cause eye irritation.

CALCIUM FLUORIDE

Inhalation hazards - Toxic effects are not reported, but exposure to dust may cause coughing and respiratory tract irritation.

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

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.

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.

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.

GLASS FIBERS (10 microns in diameter)

Inhalation hazards – Continuous filament fibrous glass is a mechanical irritant. Breathing dusts and fibers may cause short-term irritation of the mouth, nose and throat. Long-term breathing or skin conditions that are aggravated by mechanical irritants may be at a higher risk of worsening from use or contact with this product.

Other hazards – Skin contact with dust and fibers may cause itching and short-term irritation. Ingestion may cause short-term mechanical irritation of the stomach and intestines.

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

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.

IRON DUST (IRON OXIDE)

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

Other hazards – Contact may cause skin and eye irritation.

IRON PYRITE (IRON DISULFIDE)

Iron pyrite is classified as a nuisance particulate.

Inhalation hazards – Excessive inhalation of respirable dust may produce pleuritis, and/or fatal pneumonia. Acute – irritation of the eyes, skin, nose, throat and respiratory system. Chronic – exposure to high concentrations of dust and fume containing iron compounds (at least 6-10 years) may produce siderosis with changes visible on chest X-rays.

KYANITE (Naturally occurring stoichiometric oxide, $3\text{Al}_2\text{O}_3:2\text{SiO}_2$)

Inhalation hazard – May cause coughing, and shortness of breath.

Other hazards – May irritate eyes and abrade the skin.

LIMESTONE (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 – May cause mild transient eye irritation.

MAGNESIUM OXIDE

Inhalation hazard – Inhalation of fume may cause metal fume fever.

Other hazards – Serious hazard from burns. Overexposure may result in eye, skin or respiratory irritation over a long period of time.

MAN-MADE MINERAL FIBERS – (SYNTHETIC VITREOUS 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 $<1\ \mu\text{m}$) 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.

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

Thin amber flakes that are odorless. Long-term exposure to a respirable airborne concentration exceeding the TLV may lead to pneumoconiosis, but usually no functional lung impairment. The symptoms most frequently reported are chronic cough and dyspnea. May contain naturally occurring trace amounts of crystalline silica.

MOLYBDENUM SULFIDE

Inhalation hazards – Causes lung irritation, chest pain, difficult breathing and coughing.

Other hazards – Nausea, stomach irritation, vomiting and minor irritation to skin. Can cause abrasive damage to outer eye surface.

MULLITE (Manufactured stoichiometric oxide, $3\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$)

A mixture of bauxitic kaolin and amorphous glass. May contain naturally occurring trace amounts of crystalline silica. **Inhalation hazards** – Dust may cause irritation of nasal and respiratory tracts. Long-term exposure may aggravate pre-existing respiratory conditions and may cause pneumoconiosis (kaolinosis).

Other hazards – May cause irritation to the skin and eyes. Can cause abrasive damage to outer eye surface. Non-toxic if ingested.

NITRILE RUBBER

Inhalation hazards - Gases and fumes from thermal processing or decomposition of this product may cause irritation of respiratory tract, skin, and eyes.

Other hazards – May cause eye irritation if material is introduced into the eye. Eyes may feel scratchy, become red, and tear.

POTASSIUM TITANATE

Inhalation hazards – May cause irritation of respiratory system. May contain naturally occurring trace amounts of naturally occurring crystalline silica.

Other hazards – May be abrasive to skin and eyes.

Note: The potassium titanates used here are the non-acicular forms.

PETROLEUM COKE

Inhalation hazards – Overexposure to dust may result in chronic bronchitis.

Other hazards – Dust may be abrasive and irritating to eyes.

PHENOLIC RESIN – CURED

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

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

RUBBER (POWDERED)

Inhalation hazards – 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 hazards – Eyes – may cause mild transient eye irritation.

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

Inhalation hazards – Exposure to fine dust may cause mild irritation of respiratory tract.

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

SILICON CARBIDE

Inhalation hazards – May cause coughing/shortness of breath.

Other hazards – Abrasive to skin.

SILICON COMPOUNDS

Inhalation hazards – Dust may cause irritation of nasal and respiratory tracts.

Other hazards – May cause irritation of the eyes and skin..

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.

TIRE PEELS (RUBBER, RECLAIMED)

Inhalation hazards – Product may contain fibers that cause itching (see glass fibers). 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. (See rubber)

Other hazards – Eyes – may cause mild transient eye irritation.

TITANIUM DIOXIDE

Inhalation hazards – May cause irritation of the respiratory system. Extreme exposures have been reported to lead to granulomatous lesions.

Other hazards – 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.

TIN

Inhalation hazards – Acute and Chronic - When inhaled as dust or fume, tin leads to a benign pneumoconiosis without symptoms of interference with pulmonary functions.

Other hazards – May irritate stomach lining if ingested. Dust may irritate eyes.

WOLLASTONITE

Inhalation hazards – long-term cumulative inhalation of high concentrations may cause restriction of the large airways.

Other hazards – May cause minor skin irritation.

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

ZINC

Inhalation hazards – Exposure to zinc oxide can cause a flu-like illness called metal fume fever, with symptoms of metallic taste in the mouth, headaches, cough, shortness of breath, aches and chills, upset stomach and chest pain. Exposure to zinc dust may result in tightness in chest, cough, dizziness, fever, chills, nausea, vomiting.

Other hazards – Zinc oxide may be absorbed through the skin to produce the above symptoms. Repeated high exposure may cause ulcer symptoms and affect liver function.

ZIRCONIUM COMPOUNDS

Inhalation hazards – Avoid inhalation of zirconium-containing aerosols, which can cause lung granulomas.

Other hazards – Most zirconium compounds in common use are insoluble and are considered inert. Can cause damage to outer eye surface.

SECTION 4: FIRST AID MEASURES

Ingestion: Seek medical attention.

Inhalation: Move to fresh air. If irritation persists, seek medical attention.

Eye Contact: Flush with water to remove particulate. If irritation persists, 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, or abrading, 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, 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

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 known.

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

Soluble copper is known to be an ecotoxin. A study conducted by the Santa Clara Valley Authority identified copper from disc brake pad wear debris as a major contributor to the high level of copper in San Francisco Bay. These findings have been disputed and are currently under review by the Brake Manufacturers Council PEC Committee, Santa Clara Valley Authority, MEMA, and the International Copper Association.

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: 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 does not contain 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 may 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:

Ingredient:	CAS Number	% Weight
Aluminum (fume or dust)	7429-90-5	>1
Aluminum oxide (fibrous forms)	1344-28-1	>1
Antimony and Compounds	1345-04-6	>1
Copper and Compounds	7440-50-8	>1
Sodium hexametaphosphate	10124-56-8	>1%
Zinc (fume or dust)	7440-66-6	>1%

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 Service Number
 OSHA PEL: U.S. Occupational Safety and Health Administration Permissible Exposure Limit
 ACGIH TLV: American Conference of Governmental Industrial Hygienists Threshold Limit Value (2004)
 fibers/cc: Fibers per cubic centimeter of sampled air
 mg/m³: Milligrams of constituent per cubic meter of sampled air, on a weight-to-volume basis
 ppm: Parts of constituent per million parts of sampled air, on a volume-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.