



MATERIAL SAFETY DATA SHEET

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: FM2136, FM2136A, FM2155

Product No.: MSDS 0283

Manufacturer Name:

Federal Mogul World Headquarters
26555 Northwestern Highway
Southfield, Michigan 48033

Emergency Telephone:

24hr EP (INFOTRAC): 1-800-535-5053
International: (001) 352-323-3500

Non-emergency Telephone:

1-248-354-9844

Intended Use: Brake Pads

Contact Person: MSDS Request (voicemail)
1-248-354-9844

2 HAZARDS IDENTIFICATION

Emergency Overview

Physical State: Solid

Color: Gray-brown

Odor: Resin

Although several of the ingredients used to formulate this product may be hazardous in the raw state, the manufacturing process results in a solid infusible form, binding and otherwise, rendering the product inert. The ingredients may be released from the product by operations such as overheating, burning, machining, abrading, or riveting. **DANGER!** Causes skin and eye burns. Causes respiratory tract irritation. May cause allergic respiratory and skin reactions.

Potential Health Effects

Inhalation: The ingredients may be released from the product by operations such as overheating, burning, machining, abrading, or riveting. Irritating to respiratory system. May cause sensitization by inhalation. Contains a substance which may cause cancer by inhalation.

Eye Contact: The ingredients may be released from the product by operations such as overheating, burning, machining, abrading, or riveting. Causes eye burns. Risk of serious damage to eyes.

Skin Contact: The ingredients may be released from the product by operations such as overheating, burning, machining, abrading, or riveting. Causes burns. May cause sensitization by skin contact.

Ingestion: Not relevant, due to the form of the product.

Chronic Health Effects: The ingredients may be released from the product by operations such as overheating, burning, machining, abrading, or riveting. Danger of adverse health effects by prolonged exposure. Possible human cancer hazard.

Target Organ(s): | Eye | Kidney | Liver | Lung | Skin |

OSHA Regulatory Status: When used for its intended purpose, this material is classified as hazardous in accordance with OSHA 29CFR 1910.1200.

3 COMPOSITION / INFORMATION ON INGREDIENTS

General Information: The ingredients may be released from the product by operations such as overheating, burning, machining, abrading, or riveting.

Chemical Name	CAS-No.	Concentration*
†Barium sulphate	7727-43-7	> 1%
†Copper	7440-50-8	> 1%
†Wollastonite	13983-17-0	> 1%
†Antimony sulphide	1345-04-6	> 1%
†Graphite	7782-42-5	> 1%
†Zirconium oxide	1314-23-4	> 1%
†Titanium dioxide	13463-67-7	> 1%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

† This chemical is hazardous according to OSHA criteria.

4 FIRST AID MEASURES

Inhalation: Move to fresh air. If breathing stops, provide artificial respiration. For breathing difficulties, oxygen may be necessary. Get medical attention immediately.

Eye Contact: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention immediately.

Skin Contact: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If skin irritation or an allergic skin reaction develops, get medical attention. Get medical attention immediately.

Ingestion: Get medical attention.

5 FIRE-FIGHTING MEASURES

Extinguishing Media: Extinguish with foam, carbon dioxide, dry powder or water fog.

Unsuitable Extinguishing Media: Not applicable.

Special Fire Fighting Procedures: Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Unusual Fire & Explosion Hazards: None known.

Hazardous Combustion Products: Ammonia, Carbon Dioxide, Carbon Monoxide, Carbon Oxides, Formaldehyde, Hydrogen Cyanide, Metallic fumes, Nitrogen Oxides, Silicon dioxide

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions: Avoid contact with spilled material. Avoid generation and spreading of dust. Wear appropriate personal protective equipment. See Section 8 of the MSDS for Personal Protective Equipment.

Spill Cleanup Methods: Collect powder using special dust vacuum cleaner with particle filter or carefully sweep into closed container.

Environmental Precautions: Collect and dispose of spillage as indicated in section 13 of the MSDS. Avoid discharge into drains, water courses or onto the ground.

7 HANDLING AND STORAGE

Handling: Avoid all personal contact. Avoid dust formation. The ingredients may be released from the product by operations such as overheating, burning, machining, abrading, or riveting. Provide adequate ventilation. Provide easy access to water supply and eye wash facilities.

Storage: Store in a cool, dry place. Store in tightly closed original container. Avoid conditions which create dust.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits:

Chemical Name	Source	Type	Exposure Limits	Notes
Antimony sulphide	ACGIH	TWA	0.5 mg/m ³	as Sb
Antimony sulphide	NIOSH Guide	IDLH	50 mg/m ³	
Antimony sulphide	US. OSHA Table Z-1	TWA	0.5 mg/m ³	as Sb
Barium sulphate	ACGIH	TWA	10 mg/m ³	
Barium sulphate (Respirable fraction.)	US. OSHA Table Z-1	TWA	5 mg/m ³	
Copper (Fume.)	ACGIH	TWA	0.2 mg/m ³	
Copper	NIOSH Guide	IDLH	100 mg/m ³	
Copper (Fume.)	US. OSHA Table Z-1	TWA	0.1 mg/m ³	as Cu
Graphite (Respirable fraction.)	ACGIH	TWA	2 mg/m ³	
Graphite	NIOSH Guide	IDLH	1250 mg/m ³	
Graphite	OSHA Z3	TWA	15 Mppcf	
Graphite (Respirable fraction.)	US. OSHA Table Z-1	TWA	5 mg/m ³	
Titanium dioxide	ACGIH	TWA	10 mg/m ³	
Titanium dioxide	NIOSH Guide	IDLH	5000 mg/m ³	
Titanium dioxide (Total dust.)	US. OSHA Table Z-1	TWA	15 mg/m ³	
Zirconium oxide	ACGIH	STEL	10 mg/m ³	as Zr
Zirconium oxide	ACGIH	TWA	5 mg/m ³	as Zr
Zirconium oxide	NIOSH Guide	IDLH	50 mg/m ³	
Zirconium oxide	US. OSHA Table	TWA	5 mg/m ³	as Zr

	Z-1			
--	-----	--	--	--

Engineering Controls: If enclosed handling cannot be guaranteed, ventilation and protective clothing must be used. Adequate ventilation should be provided so that exposure limits are not exceeded. The risk of inhalation of dust must be minimized as much as possible. An eye wash and safety shower must be available in the immediate work area. This product may be capable of generating 0.1 ppm or greater formaldehyde vapors under certain use conditions. According to OSHA 29 CFR 1910.1048, formaldehyde vapors may be considered hazardous if workplace airborne concentrations exceed 0.1 ppm.

Respiratory Protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.

Eye Protection: Wear safety glasses with side shields (or goggles) and a face shield.

Hand Protection: Wear chemical-resistant gloves. Contact glove manufacturer for specific information.

Skin Protection: Wear appropriate clothing to prevent any possibility of skin contact.

Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Environmental Exposure Controls: Environmental manager must be informed of all major spillages.

9

PHYSICAL AND CHEMICAL PROPERTIES

Color: Gray-brown

Odor: Resin

Odor Threshold: No data available.

Physical State: Solid

pH: No data available

Melting Point: No data available.

Freezing Point: Not applicable.

Boiling Point: No data available.

Flash Point: No data available.

Evaporation Rate: No data available.

Flammability (Solid): No data available.

Flammability Limit - Upper (%): No data available.

Flammability Limit - Lower (%): No data available.

Vapor Pressure: No data available.

Vapor Density (Air=1): No data available.

Specific Gravity: 2 - 3

Solubility in Water: No data available.

Solubility (Other): No data available.

Partition Coefficient (n-Octanol/water): No data available.

Autoignition Temperature: No data available.

Decomposition Temperature: No data available.

Viscosity: No data available.

10 STABILITY AND REACTIVITY

Stability: This product is stable under expected conditions of use.

Conditions to Avoid: None known.

Incompatible Materials: Strong oxidizing agents.

Hazardous Decomposition Products:

At Elevated Temperatures:	Ammonia, Formaldehyde, Hydrogen Cyanide, Metallic fumes, Nitrogen Oxides
---------------------------	--

Possibility of Hazardous Reactions: No data available.

11 TOXICOLOGICAL INFORMATION

Specified Substance(s)

Acute Toxicity:

Component Chemical Name	Test Results
Antimony sulphide	Dermal LD50 (Rat): 2001 mg/kg
Antimony sulphide	Inhalation LC50 (4 hour(s), Rat): 5.04 mg/l
Antimony sulphide	Intraperitoneal LDLo (Rat): 1390 mg/kg
Antimony sulphide	Oral LD50 (Rat): 2001 mg/kg

Listed Carcinogens:

Chemical Name	IARC	NTP	OSHA	ACGIH
Wollastonite	3	Not Listed	Not Listed	Not Listed
Barium sulphate	Not Listed	Not Listed	Not Listed	A4
Zirconium oxide	Not Listed	Not Listed	Not Listed	A4
Titanium dioxide	2B	Not Listed	Not Listed	A4
Antimony sulphide	3	Not Listed	Not Listed	Not Listed

IARC: 1 = Carcinogenic to Humans; 2A = Probably Carcinogenic to Humans; 2B = Possibly Carcinogenic to Humans; 3 = Not classifiable as to carcinogenicity to humans; 4 = Probably not carcinogenic to humans; Not listed = Not evaluated by IARC.

ACGIH: A1 = Confirmed Human Carcinogen; A2 = Suspected Human Carcinogen; A3 = Confirmed Animal Carcinogen; A4 = Not classifiable as a human carcinogen; A5 = Not suspected to be a human carcinogen; Not listed = Not evaluated by ACGIH.

Product Information

Other Acute: Dusts may irritate the respiratory tract, skin and eyes. The ingredients may be released from the product by operations such as overheating, burning, machining, abrading, or riveting. Causes skin and eye burns. Causes respiratory tract irritation. May cause allergic respiratory and skin reactions.

Chronic Toxicity: The ingredients may be released from the product by operations such as overheating, burning, machining, abrading, or riveting. Possible cancer hazard - may cause cancer based on animal

data. May cause lung damage based on animal data. May cause damage to the liver and kidneys.

12	ECOLOGICAL INFORMATION
-----------	-------------------------------

Ecotoxicity: The environmental hazard of the product is considered to be limited.

Mobility: No data available

Persistence and Degradability: No data available

Bioaccumulation Potential: No data available

13	DISPOSAL CONSIDERATIONS
-----------	--------------------------------

General Information: Dispose of waste and residues in accordance with local authority requirements.

Disposal Methods: Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

Container: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14	TRANSPORT INFORMATION
-----------	------------------------------

DOT Not Regulated

TDG Not Regulated

IATA Not Regulated

IMDG Not Regulated

15	REGULATORY INFORMATION
-----------	-------------------------------

Inventory Status: All ingredients are either listed or exempt from listing on TSCA.

US Regulations

CERCLA Hazardous Substance List (40 CFR 302.4):

Chemical Name	RQ
Barium sulphate	1000 lbs
Copper	5000 lbs

SARA Title III

Section 302 Extremely Hazardous Substances (40 CFR 355, Appendix A): None

Section 311/312 (40 CFR 370):

☒ Acute (Immediate) ☒ Chronic (Delayed) ☐ Fire ☐ Reactive ☐ Pressure Generating

Section 313 Toxic Release Inventory (40 CFR 372):

Chemical Name	CAS-No.	Concentration
Copper	7440-50-8	> 1%
Antimony sulphide	1345-04-6	> 1%

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130): None

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3): None

Drug Enforcement Act: None

TSCA: No component is listed on TSCA Sections 4(a), 5(a)(2), 5(e) or 12(b).

State Regulations

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): None

Massachusetts Right-To-Know List: Barium sulphate; Copper; Graphite; Titanium dioxide; Zirconium oxide

Michigan Critical Materials List (Michigan Natural Resources and Environmental Protection Act (Act. 451 of 1994)): Copper

Minnesota Hazardous Substances List: Antimony sulphide; Barium sulphate; Copper; Graphite; Titanium dioxide; Zirconium oxide

New Jersey Right-To-Know List: Antimony sulphide; Barium sulphate; Copper; Titanium dioxide

Pennsylvania Right-To-Know List: Barium sulphate; Copper; Graphite; Titanium dioxide

Rhode Island Right-To-Know List: Antimony sulphide; Copper; Graphite; Titanium dioxide; Zirconium oxide

16 OTHER INFORMATION

HAZARD RATINGS

	Health Hazard	Fire Hazard	Reactivity Hazard	Special Hazard
NFPA	3	1	0	--

	Health Hazard	Fire Hazard	Reactivity Hazard	Personal Protection
HMIS	3*	1	0	J

0 - Minimal; 1- Slight; 2 - Moderate; 3 - Serious; 4 - Severe * - Chronic Health Effect

J - Goggles, Gloves, Apron, Dust, Vapor Respirator

Issued by: Federal Mogul Corporation

Issue Date: 29-Mar-2007

Supersedes Date: 29-Mar-2007

SDS No.: 1005410

Disclaimer: The information provided on this data sheet was abstracted from supplier material safety data sheets 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 is however, as of the date provided, true and accurate to the best of Federal-Mogul's knowledge, and should be used to make an independent determination of the methods to safeguard workers and the environment.