MATERIAL SAFETY DATA SHEET

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name: ABEX, FA, FERODO, FM, GNBX, TQ, WE, BBS (see section 16)

Product No.: 237

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: Drum brake lining. Friction Material

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

2 HAZARDS IDENTIFICATION

Emergency Overview
Physical State: Linings
Color: Gray
Odor: Resin

WARNING!
Dust can be created by the machining of finished products. Cancer hazard - can cause cancer. Causes skin, eye and respiratory tract irritation. Harmful if inhaled. May cause allergic skin reaction.

Potential Health Effects

Inhalation: The ingredients may be released as general dust from the product by operations such as overheating, burning, machining, abrading, or riveting. Harmful if inhaled. Dust irritating to respiratory tract. Inhalation of powder or fumes may cause metal fume fever. Inhalation may lead to deposition in lung and in sufficient quantities produce baritosis.

Eye Contact: Dust in the eyes will cause irritation. Exposed individuals may experience eye tearing, redness, and discomfort.

Skin Contact: The ingredients may be released as general dust from the product by operations such as overheating, burning, machining, abrading, or riveting. Dust: Causes skin irritation. May cause allergic skin reaction.

Ingestion: The ingredients may be released as general dust from the product by operations such as overheating, burning, machining, abrading, or riveting. May cause discomfort if swallowed.

Chronic Health Effects: The ingredients may be released as general dust from the product by

operations such as overheating, burning, machining, abrading, or riveting. Cancer hazard - can cause cancer. May cause lung damage. Prolonged and repeated overexposure to dust can lead to benign pneumoconiosis. May cause damage to the liver and kidneys.

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

Potential Physical / Chemical Effects: This product is not flammable or combustible.

OSHA Regulatory Status: This product is hazardous according to OSHA 29CFR 1910.1200.

Environment: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

3 COMPOSITION / INFORMATION ON INGREDIENTS

General Information: This product contains a variety of ingredients all of which have become part of a bound system both physically and chemically and do not necessarily exhibit the properties of the individual components. The ingredients may be released as general dust from the product by operations such as overheating, burning, machining, abrading, or riveting. The formulations listed in Section 1 do not contain all of the ingredients listed below.

Chemical Name	CAS-No.	Concentration*
†Acrylic Fibers	24980-62-9	> 1%
†Aluminium oxide	1344-28-1	> 1%
†Aluminum powder (stabilized)	7429-90-5	> 1%
†Barium sulphate	7727-43-7	> 1%
†Calcium carbonate	471-34-1	> 1%
†Calcium hydroxide	1305-62-0	> 1%
†Carbon black	1333-86-4	> 1%
†Cashew, nutshell liq.	8007-24-7	> 1%
†Cellulose	9004-34-6	> 1%
†Ceramic fiber	142844-00-6	> 1%
†Copper	7440-50-8	> 1%
†Crystalline silica	1317-95-9	> 1%
†Diantimony trioxide	1309-64-4	> 1%
†Glass fiber	65997-17-3	> 1%
†Graphite	7782-42-5	> 1%
†Limestone	1317-65-3	> 1%
†Mica	12001-26-2	> 1%
†Para-aramid polymer	26125-61-1	> 1%
†Silicon oxide	7631-86-9	> 1%
†Sulfur	7704-34-9	> 1%
†Talc	14807-96-6	> 1%
†Wollastonite	13983-17-0	> 1%
†Zinc Oxide	1314-13-2	> 1%

† This chemical is hazardous according to OSHA/WHMIS criteria.

4 FIRST AID MEASURES

Inhalation: Move injured person into fresh air and keep person calm under observation. If necessary, seek hospital and take along these instructions.

Eye Contact: Do not rub eye. Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyes wide apart. Get medical attention promptly if symptoms occur after washing.

Skin Contact: Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms persist or occur after washing.

Ingestion: If swallowed, rinse mouth with water (only if the person is conscious). Get medical attention if any discomfort continues.

5 FIRE-FIGHTING MEASURES

Extinguishing Media: This product is not flammable. Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable Extinguishing Media: None.

Special Fire Fighting Procedures: Use standard firefighting procedures and consider the hazards of other involved materials.

Unusual Fire & Explosion Hazards: The product is non-combustible. If heated, toxic vapors may be formed.

Hazardous Combustion Products: Antimony oxides, Calcium oxides, Carbon Dioxide, Carbon Monoxide, Metallic fumes, Sulfur Oxides, Zinc oxides

Protective Measures: Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace.

Flammability Class: Dust: NFPA Rating Fire = 1. Materials that must be preheated before ignition can occur.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use explosion-proof electrical equipment if airborne dust levels are high. Avoid dust formation. Avoid inhalation of dust and contact with skin and eyes. Wear necessary 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. Do not vacuum clean unless vacuum cleaners are equipped with HEPA filter. For waste disposal, see section 13 of the MSDS.

Environmental Precautions: Do not allow to enter drains, sewers or watercourses. Collect and dispose of spillage as indicated in section 13 of the MSDS.

Notification Procedures: In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

7 HANDLING AND STORAGE

Handling: Provide adequate ventilation. Avoid dust formation. Avoid inhalation of dust and contact with skin and eyes. Use work methods which minimize dust production. See Section 8 of the MSDS for Personal Protective Equipment. Observe good industrial hygiene practices.

Storage: Store in tightly closed original container. Avoid conditions which create dust. Protect against direct sunlight. Store away from incompatible materials.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits:

Chemical Name	Source	Type	Exposure Limits	Notes
Aluminium oxide (Respirable fraction.)	US. OSHA Z-1 PEL	TWA	5 mg/m³	
Aluminum powder (stabilized) (Respirable fraction.)	US. ACGIH TLV	TWA	1 mg/m³	
Aluminum powder (stabilized) (Respirable dust.)	US. OSHA Z-1 PEL	TWA	5 mg/m³	as Al
Aluminum powder (stabilized) (Total dust.)	US. OSHA Z-1 PEL	TWA	15 mg/m³	as Al
Barium sulphate	US. ACGIH TLV	TWA	10 mg/m³	
Barium sulphate (Respirable fraction.)	US. OSHA Z-1 PEL	TWA	5 mg/m³	
Calcium carbonate (Total dust.)	US. OSHA Z-1 PEL	TWA	15 mg/m³	
Calcium carbonate (Respirable fraction.)	US. OSHA Z-1 PEL	TWA	5 mg/m³	
Calcium hydroxide	US. ACGIH TLV	TWA	5 mg/m³	
Calcium hydroxide (Respirable fraction.)	US. OSHA Z-1 PEL	TWA	5 mg/m³	
Carbon black	US. ACGIH TLV	TWA	3.5 mg/m³	
Carbon black	US. NIOSH Guide	IDLH	1750 mg/m³	
Carbon black	US. OSHA Z-1 PEL	TWA	3.5 mg/m³	
Cellulose	US. ACGIH TLV	TWA	10 mg/m³	
Cellulose	US. NIOSH Guide	IDLH	-	
Cellulose (Respirable fraction.)	US. OSHA Z-1 PEL	TWA	5 mg/m³	
Ceramic fiber	US. ACGIH TLV	TWA	0.2 fibers/cm³	
Copper (Fume.)	US. ACGIH TLV	TWA	0.2 mg/m³	
Copper	US. NIOSH Guide	IDLH	100 mg/m³	
Copper (Fume.)	US. OSHA Z-1 PEL	TWA	0.1 mg/m³	as Cu
Crystalline silica (Respirable fraction.)	US. ACGIH TLV	TWA	0.1 mg/m³	as quartz
Diantimony trioxide	US. ACGIH TLV	TWA	0.5 mg/m³	as Sb
Diantimony trioxide	US. NIOSH Guide	IDLH	50 mg/m³	
Diantimony trioxide	US. OSHA Z-1 PEL	TWA	0.5 mg/m³	as Sb
Glass fiber (Inhalable fraction.)	US. ACGIH TLV	TWA	5 mg/m³	
Glass fiber	US. NIOSH Guide	IDLH	-	
Graphite (Respirable fraction.)	US. ACGIH TLV	TWA	2 mg/m³	
Graphite	US. NIOSH Guide	IDLH	1250 mg/m³	

Graphite	US. OSHA Z-3 PEL	TWA	15 Mppcf	
Limestone	US. NIOSH Guide	IDLH	-	
Limestone (Respirable fraction.)	US. OSHA Z-1 PEL	TWA	5 mg/m³	
Mica (Respirable fraction.)	US. ACGIH TLV	TWA	3 mg/m³	
Mica	US. NIOSH Guide	IDLH	1500 mg/m³	
Mica	US. OSHA Z-3 PEL	TWA	20 Mppcf	
Silicon oxide	US. NIOSH Guide	IDLH	3000 mg/m³	
Silicon oxide	US. OSHA Z-3 PEL	TWA	20 Mppcf	
Talc (Respirable fraction.)	US. ACGIH TLV	TWA	2 mg/m³	
Talc	US. NIOSH Guide	IDLH	1000 mg/m³	
Talc	US. OSHA Z-3 PEL	TWA	20 Mppcf	
Talc (Respirable.)	US. OSHA Z-3 PEL	TWAC	0.1 mg/m³ 2.4 Mppcf	
Talc (Total dust.)	US. OSHA Z-3 PEL	OSHA Z3 (TWA)	0.3 mg/m³	
Zinc Oxide (Respirable fraction.)	US. ACGIH TLV	TWA	2 mg/m³	
Zinc Oxide (Respirable fraction.)	US. ACGIH TLV	STEL	10 mg/m³	
Zinc Oxide	US. NIOSH Guide	IDLH	500 mg/m³	
Zinc Oxide (Fume.)	US. OSHA Z-1 PEL	TWA	5 mg/m³	
Zinc Oxide (Respirable fraction.)	US. OSHA Z-1 PEL	TWA	5 mg/m³	

Consult Canadian Provincial Regulations and/or Mexican Regulations on exposure limits, if applicable.

Engineering Controls: Use explosion-proof electrical equipment if airborne dust levels are high. Provide adequate ventilation. Observe occupational exposure limits and minimize the risk of inhalation of dust.

Respiratory Protection: During dust-raising work: Respirator type: Air-purifying respirator with a high efficiency particulate filter.

Eye Protection: Wear approved safety goggles.

Hand Protection: Wear protective gloves. Suitable gloves can be recommended by the glove supplier.

Skin Protection: Wear suitable protective clothing.

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. Observe any medical surveillance requirements.

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

9 PHYSICAL AND CHEMICAL PROPERTIES

Color: Gray
Odor: Resin
Odor Threshold: No data available.
Physical State: Linings
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 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: 2.2 - 3.2 (20°C)
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.
Volatile Organic Compounds (VOC): Not applicable.
Viscosity: Not applicable.

10 STABILITY AND REACTIVITY

Stability: Material is stable under normal conditions.

Conditions to Avoid: None known.

Incompatible Materials: Oxidizing agents. Acids.

Hazardous Decomposition Products:

At Elevated Temperatures:	Calcium oxides, Carbon Dioxide, Carbon Monoxide, Metallic fumes, Sulfur Oxides, Zinc oxides

Possibility of Hazardous Reactions: Will not occur.

11 TOXICOLOGICAL INFORMATION

Specified Substance(s)
Acute Toxicity:

Chemical Name	Test Results
Aluminium oxide	Inhalation TCLo-Lowest Toxic Conc. (5 hour(s), Rat): 200 mg/m³
Aluminium oxide	Intraperitoneal LD50 (Mouse): >3600 mg/kg
Calcium carbonate	Oral LD50 (Rat): 6450 mg/kg
Calcium hydroxide	Oral LD50 (Rat): 7340 mg/kg
Diantimony trioxide	Oral LD50 (Rat): >34600 mg/kg
Carbon black	Dermal LD50 (Rabbit): > 3000 mg/kg
Carbon black	Oral LD50 (Rat): > 15400 mg/kg
Sulfur	Dermal LD50 (Rat): > 2020 mg/kg
Sulfur	Oral LD50 (Rat): > 5050 mg/kg
Cellulose	Inhalation LC50 (4 hour(s), Rat): >5800 mg/m³
Zinc Oxide	Inhalation LC50 (Mouse): 2500 mg/m³
Zinc Oxide	Oral LD50 (Rat): 8437 mg/kg

Listed Carcinogens:

Chemical Name	IARC	NTP	OSHA	ACGIH
Silicon oxide	3	Not Listed	Not Listed	Not Listed
Ceramic fiber	2B	Not Listed	Not Listed	A2
Crystalline silica	1	Listed	Not Listed	Not Listed
Wollastonite	3	Not Listed	Not Listed	Not Listed
Talc	Not Listed	Not Listed	Not Listed	A4
Diantimony trioxide	2B	Not Listed	Not Listed	A2
Para-aramid polymer	3	Not Listed	Not Listed	Not Listed
Carbon black	2B	Not Listed	Not Listed	A4

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

Acute Toxicity:

Test Results: No test data available for the product.

Other Acute: The ingredients may be released as general dust from the product by operations such as overheating, burning, machining, abrading, or riveting. Harmful if inhaled. Causes skin, eye and respiratory tract irritation. May cause allergic skin reaction. Inhalation of powder or fumes may cause metal fume fever.

Chronic Toxicity: The ingredients may be released as general dust from the product by operations such as overheating, burning, machining, abrading, or riveting. Cancer hazard - can cause cancer. May cause lung damage. Prolonged and repeated overexposure to dust can lead to benign pneumoconiosis. May cause damage to the liver and kidneys.

12 ECOLOGICAL INFORMATION

Ecotoxicity: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Specified Substance(s)

Chemical Name	Test
Calcium hydroxide	LC50 (96 hour(s), Fish): 33.9 mg/l
Carbon black	EC50 (24 hour(s), Daphnia magna): >5600 mg/l
Carbon black	EC50 (72 hour(s), Green alga): >10000 mg/l
Carbon black	LC50 (96 hour(s), Zebra Fish): >1000 mg/l

Mobility: The product is insoluble in water and will sediment in water systems.

Persistence and Degradability: The product contains inorganic compounds which are not biodegradable.

Bioaccumulation Potential: No data available.

Other Adverse Effects: 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

Canadian Controlled Products Regulations: This product has been classified according to the hazard criteria of the Canadian Controlled Products Regulations, Section 33, and the MSDS contains all required information.

WHMIS Classification: D2A, D2B

Mexican Dangerous Statement: This product is dangerous according to Mexican regulations.

US Regulations

CERCLA Hazardous Substance List (40 CFR 302.4):

Chemical Name	RQ
Copper	5000 lbs
Barium sulphate	1000 lbs
Diantimony trioxide	1000 lbs
Zinc Oxide	-

- : No reportable quantity.

SARA Title III

Section 302 Extremely Hazardous Substances (40 CFR 355, Appendix A): Not regulated.

Section 311/312 (40 CFR 370):

[X] Acute (Immediate) [X] Chronic (Delayed) [ ] Fire [ ] Reactive [ ] Pressure Generating

Section 313 Toxic Release Inventory (40 CFR 372):

Chemical Name	CAS-No.	Reporting threshold for other users	Reporting threshold for manufacturing

			and processing
Copper	7440-50-8	10000 lbs	25000 lbs
Diantimony trioxide	1309-64-4	10000 lbs	25000 lbs
Aluminum (Fume or dust)	7429-90-5	10000 lbs	25000 lbs
Aluminium oxide	1344-28-1	10000 lbs	25000 lbs
Zinc Oxide	1314-13-2	10000 lbs	25000 lbs

For reporting purposes: the De Minimis Concentration for a toxic chemical in a mixture is 0.1% for carcinogens as defined in 29 CFR 1910.1200(d)(4) or 1% for others.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
Not regulated.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3): Diantimony trioxide

Drug Enforcement Act: Not regulated.

TSCA

TSCA Section 4(a) Final Test Rules & Testing Consent Orders: Not regulated.

TSCA Section 5(a)(2) Final Significant New Use Rules (SNURs) (40CFR 721, Subpt. E): Not regulated.

TSCA Section 5(e) PMN-Substance Consent Orders: Not regulated.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D): Ceramic fiber

State Regulations

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): Carbon black; Crystalline silica; Diantimony trioxide

Massachusetts Right-To-Know List: Aluminium oxide; Aluminum powder (stabilized); Barium sulphate; Calcium carbonate; Calcium hydroxide; Carbon black; Cellulose; Copper; Crystalline silica; Diantimony trioxide; Glass fiber; Graphite; Limestone; Mica; Silicon oxide; Sulfur; Talc; Zinc Oxide

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

Minnesota Hazardous Substances List: Aluminium oxide; Aluminum powder (stabilized); Barium sulphate; Calcium hydroxide; Carbon black; Cellulose; Copper; Crystalline silica; Diantimony trioxide; Glass fiber; Graphite; Limestone; Mica; Silicon oxide; Zinc Oxide

New Jersey Right-To-Know List: Aluminium oxide; Aluminum powder (stabilized); Barium sulphate; Calcium hydroxide; Carbon black; Copper; Crystalline silica; Diantimony trioxide; Glass fiber; Mica; Silicon oxide; Sulfur; Talc; Zinc Oxide

Pennsylvania Right-To-Know List: Aluminium oxide; Aluminum powder (stabilized); Barium sulphate; Calcium carbonate; Calcium hydroxide; Carbon black; Cellulose; Copper; Crystalline silica; Diantimony trioxide; Glass fiber; Graphite; Limestone; Mica; Silicon oxide; Sulfur; Talc; Zinc Oxide

Rhode Island Right-To-Know List: Aluminium oxide; Calcium hydroxide; Carbon black; Cellulose; Copper; Crystalline silica; Diantimony trioxide; Glass fiber; Graphite; Limestone; Mica; Sulfur; Talc; Zinc Oxide

16 OTHER INFORMATION

HAZARD RATINGS

	Health Hazard	Fire Hazard	Instability	Special Hazard
NFPA	2	1	0	--

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe
NFPA Label colored diamond code: Blue - Health; Red - Flammability; Yellow - Instability; White - Special Hazards

	Health Hazard	Flammability	Physical Hazard	Personal Protection
HMIS	2*	1	0	E

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe *- Chronic Health Effect
Personal Protection codes: E - Safety Glasses, Gloves, Dust Respirator
HMIS Label colored bar code: Blue - Health; Red - Flammability; Orange - Physical Hazards; White - Special

General Information: ABEX (6020, 6035, 6037, 6047, 6048, 6068, 6079, 6080, 6082, 6097, 6103, 6110, 6125, 6126, 6127, 6135, 6150, 6206, 6224, 685, 697)
FA (903, 904, 906, 908, 910, 912, 916, NB-1, PM23-1)
FERODO (3038, 3057, 3074, 3075, 3076, 3102, 3135, 3137, 3165, 3169, 3172, 3177, 3184, 3185, 3187, 3190, 3198, 372, 373, 374, 3219)
FM (2031, 2041, 2058, 2059, 2088, 2089, 2090, 2100, 2116, 2151, 2153, 2181, 2185, 2188, 2189, 2200, 2202, 2203, 2204, 2206, 2216, 2237)
BBS 34, GNBX (3)
TQ (201, 202, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214)
WE (103,105, 106,130, 133, 134,147,153, 155, 156,157, 158, 159,160,161, 162, 163, 164, 167, 168, 169, 170, 171, 172, 173, 174, 175)

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