1. Identification

Product identifier: FM2136A, FM2136, FM2136CH

Product code: 386

Recommended use: Friction material, drum brake.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer/Supplier: Federal-Mogul Motorparts

World Headquarters
27300 West 11 Mile Road
Southfield, Michigan 48034
USA

Contact person: msds.request@federalmogul.com

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

2. Hazard(s) identification

Physical hazards: Not classified.

Health hazards: Not classified.

OSHA defined hazards: Not classified.

Label elements

Hazard symbol: None.

Signal word: None.

Hazard statement: Exempt (manufactured article).

Precautionary statement

Prevention: Observe good industrial hygiene practices.

Response: No specific first aid measures noted.

Storage: Store in original container.

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

Hazard(s) not otherwise classified (HNOC): None known.

Supplemental information: None.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium sulphate</td>
<td>7727-43-7</td>
<td>15 - 45</td>
</tr>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>10 - 30</td>
</tr>
<tr>
<td>Zirconium dioxide</td>
<td>1314-23-4</td>
<td>10 - 30</td>
</tr>
<tr>
<td>Potassium titanium oxide</td>
<td>12056-51-8</td>
<td>10 - 17</td>
</tr>
<tr>
<td>Wollastonite</td>
<td>13983-17-0</td>
<td>3 - 7</td>
</tr>
<tr>
<td>Graphite</td>
<td>7782-42-5</td>
<td>2 - 6</td>
</tr>
<tr>
<td>Antimony sulfide</td>
<td>1345-04-6</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>
Composition comments

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

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.

Skin contact
Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if irritation develops and persists.

Eye contact
Dust in the eyes: Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyelids wide apart. Get medical attention if irritation develops and persists.

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

Most important symptoms/effects, acute and delayed
Exposed individuals may experience eye tearing, redness, and discomfort.

Indication of immediate medical attention and special treatment needed
Treat symptomatically.

General information
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media
Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media
None.

Specific hazards arising from the chemical
By heating and fire, toxic vapors/gases may be formed.

Special protective equipment and precautions for firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions
Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards
This product is not flammable. Will burn if involved in a fire.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
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 SDS for Personal Protective Equipment.

Methods and materials for containment and cleaning up
In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. 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 SDS.

Environmental precautions
Avoid discharge into drains, water courses or onto the ground. Collect and dispose of spillage as indicated in Section 13 of the SDS.

7. Handling and storage

Precautions for safe 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 SDS for Personal Protective Equipment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities
Store in tightly closed original container. Avoid conditions which create dust. Protect against direct sunlight.
### 8. Exposure controls/personal protection

#### Occupational exposure limits

**US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide (CAS 1344-28-1)</td>
<td>PEL</td>
<td>5 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mg/m³</td>
<td>Total dust.</td>
</tr>
<tr>
<td>Antimony sulfide (CAS 1345-04-6)</td>
<td>PEL</td>
<td>0.5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Barium sulphate (CAS 7727-43-7)</td>
<td>PEL</td>
<td>5 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mg/m³</td>
<td>Total dust.</td>
</tr>
<tr>
<td>Calcium dihydroxide (CAS 1305-62-0)</td>
<td>PEL</td>
<td>5 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mg/m³</td>
<td>Total dust.</td>
</tr>
<tr>
<td>Copper (CAS 7440-50-8)</td>
<td>PEL</td>
<td>1 mg/m³</td>
<td>Dust and mist.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1 mg/m³</td>
<td>Fume.</td>
</tr>
<tr>
<td>Graphite (CAS 7782-42-5)</td>
<td>PEL</td>
<td>5 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mg/m³</td>
<td>Total dust.</td>
</tr>
<tr>
<td>Zirconium dioxide (CAS 1314-23-4)</td>
<td>PEL</td>
<td>5 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

**US. OSHA Table Z-3 (29 CFR 1910.1000)**

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide (CAS 1344-28-1)</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mg/m³</td>
<td>Total dust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 mppcf</td>
<td>Total dust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mppcf</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td>Barium sulphate (CAS 7727-43-7)</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mg/m³</td>
<td>Total dust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 mppcf</td>
<td>Total dust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mppcf</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td>Graphite (CAS 7782-42-5)</td>
<td>TWA</td>
<td>15 mppcf</td>
<td></td>
</tr>
</tbody>
</table>

**US. ACGIH Threshold Limit Values**

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide (CAS 1344-28-1)</td>
<td>TWA</td>
<td>1 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td>Antimony sulfide (CAS 1345-04-6)</td>
<td>TWA</td>
<td>0.5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Barium sulphate (CAS 7727-43-7)</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>Inhalable fraction.</td>
</tr>
<tr>
<td>Calcium dihydroxide (CAS 1305-62-0)</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Copper (CAS 7440-50-8)</td>
<td>TWA</td>
<td>1 mg/m³</td>
<td>Dust and mist.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.2 mg/m³</td>
<td>Fume.</td>
</tr>
<tr>
<td>Graphite (CAS 7782-42-5)</td>
<td>TWA</td>
<td>2 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td>Zirconium dioxide (CAS 1314-23-4)</td>
<td>STEL</td>
<td>10 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Components</td>
<td>Value</td>
<td>Form</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>---------------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td>Antimony sulfide (CAS 1345-04-6)</td>
<td>TWA 0.5 mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barium sulphate (CAS 7727-43-7)</td>
<td>TWA 5 mg/m³</td>
<td>Respirable.</td>
<td></td>
</tr>
<tr>
<td>Calcium dihydroxide (CAS 1305-62-0)</td>
<td>TWA 5 mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper (CAS 7440-50-8)</td>
<td>TWA 1 mg/m³</td>
<td>Dust and mist.</td>
<td></td>
</tr>
<tr>
<td>Graphite (CAS 7782-42-5)</td>
<td>TWA 2.5 mg/m³</td>
<td>Respirable.</td>
<td></td>
</tr>
<tr>
<td>Poly (p-phenylenediamine terephthalamide) (CAS 26125-61-1)</td>
<td>TWA 3 fibers/cm³</td>
<td>Fiber.</td>
<td></td>
</tr>
<tr>
<td>Zirconium dioxide (CAS 1314-23-4)</td>
<td>STEL 10 mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TWA 5 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Biological limit values**

No biological exposure limits noted for the ingredient(s).

**Appropriate 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.

**Individual protection measures, such as personal protective equipment**

- **Eye/face protection**: Wear approved safety goggles.
- **Skin protection**
  - **Hand protection**: Wear protective gloves (i.e. latex, nitrile). Suitable gloves can be recommended by the glove supplier.
  - **Other**: Wear suitable protective clothing.
- **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. During dust-raising work: In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 1910.134. Respirator type: Any powered, air-purifying respirator with a high-efficiency particulate filter.
- **Thermal hazards**: Wear appropriate thermal protective clothing, when necessary.
- **General hygiene considerations**: 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.

**9. Physical and chemical properties**

- **Appearance**: Solid (article).
- **Physical state**: Solid.
- **Form**: Solid.
- **Color**: Gray/black.
- **Odor**: None.
- **Odor threshold**: Not applicable.
- **pH**: Not applicable.
- **Melting point/freezing point**: Not applicable.
- **Initial boiling point and boiling range**: Not applicable.
- **Flash point**: Not applicable.
- **Evaporation rate**: Not available.
- **Flammability (solid, gas)**: Not applicable.
Upper/lower flammability or explosive limits

Flammability limit - lower (%)
Not applicable.

Flammability limit - upper (%)
Not applicable.

Vapor pressure
Not applicable.

Vapor density
Not applicable.

Relative density
2 - 3.7 (20° C)

Solubility(ies)

Solubility (water)
Insoluble in water.

Partition coefficient (n-octanol/water)
Not applicable.

Auto-ignition temperature
Not applicable.

Decomposition temperature
Not available.

Viscosity
Not applicable.

Other information

Explosive properties
Not explosive.

Oxidizing properties
Not oxidizing.

10. Stability and reactivity

Reactivity
The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability
Material is stable under normal conditions.

Possibility of hazardous reactions
Will not occur.

Conditions to avoid
None known.

Incompatible materials
None known.

Hazardous decomposition products
Carbon oxides. Metallic fumes.

11. Toxicological information

Information on likely routes of exposure

Inhalation
Dust may cause eye, skin and respiratory tract irritation. Inhalation of powder or fumes may cause metal fume fever. Inhalation may lead to deposition in lung and in sufficient quantities produce baritosis.

Skin contact
Dust may irritate skin.

Eye contact
Dust may irritate the eyes.

Ingestion
May cause discomfort if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics
Exposed individuals may experience eye tearing, redness, and discomfort.

Information on toxicological effects

Acute toxicity
The ingredients may be released as general dust from the product by operations such as overheating, burning, machining, abrading, or riveting. Dust may cause eye, skin and respiratory tract irritation.

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium sulphate (CAS 7727-43-7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>307 g/kg</td>
</tr>
<tr>
<td>Copper (CAS 7440-50-8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inhalation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>&gt; 2.77 mg/l, 4 hours</td>
</tr>
</tbody>
</table>
FIR No. 173847 Contact product manufacturer for latest (M)SDS

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>Rat</td>
<td>481 mg/kg</td>
</tr>
<tr>
<td>Graphite (CAS 7782-42-5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Dermal</td>
<td>Mouse</td>
<td>&gt; 5000 mg/kg</td>
</tr>
<tr>
<td>Oral</td>
<td>Rat</td>
<td>&gt; 10000 mg/kg</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation Dust may irritate skin.
Serious eye damage/eye irritation Dust may irritate the eyes.

Respiratory or skin sensitization
- Respiratory sensitization: No data available.
- Skin sensitization: Not a skin sensitizer.
- Germ cell mutagenicity: No data available.
- Carcinogenicity: Not classified.

**IARC Monographs. Overall Evaluation of Carcinogenicity**
- Antimony sulfide (CAS 1345-04-6) 3 Not classifiable as to carcinogenicity to humans.
- Poly (p-phenylenediamine terephthalamide) (CAS 26125-61-1) 3 Not classifiable as to carcinogenicity to humans.
- Wollastonite (CAS 13983-17-0) 3 Not classifiable as to carcinogenicity to humans.

**NTP Report on Carcinogens**
- Not listed.

- Not regulated.

**Reproductive toxicity**
- No data available.

**Specific target organ toxicity - single exposure**
- No data available.

**Specific target organ toxicity - repeated exposure**
- No data available.

**Aspiration hazard**
- Not relevant, due to the form of the product.

**Chronic effects**
The ingredients may be released as general dust from the product by operations such as overheating, burning, machining, abrading, or riveting. May cause damage to the liver and kidneys. May cause lung damage.

**12. Ecological information**

**Ecotoxicity**
- Not relevant, due to the form of the product in its manufactured and shipped state.

**Persistence and degradability**
The product contains inorganic compounds which are not biodegradable.

**Bioaccumulative potential**
- No data available.

**Mobility in soil**
- Not relevant, due to the form of the product.

**Mobility in general**
- Not relevant, due to the form of the product.

**Other adverse effects**
This product contains one or more substances identified as hazardous air pollutants (HAPs) per the US Federal Clean Air Act (see section 15).

**13. Disposal considerations**

**Disposal instructions**
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.

**Local disposal regulations**
Dispose of in accordance with local regulations.

**Hazardous waste code**
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

**Waste from residues / unused products**
Dispose of waste and residues in accordance with local authority requirements.

**Contaminated packaging**
Since emptied containers retain product residue, follow label warnings even after container is emptied.
14. Transport information

DOT
Not regulated as dangerous goods.

IATA
Not regulated as dangerous goods.

IMDG
Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not established.

15. Regulatory information

US federal regulations
Under some use conditions, this material may be considered to be hazardous in accordance with OSHA 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Potassium titanium oxide (CAS 12056-51-8) 1.0 % One-Time Export Notification only.

CERCLA Hazardous Substance List (40 CFR 302.4)
Antimony sulfide (CAS 1345-04-6) Listed.
Barium sulphate (CAS 7727-43-7) Listed.
Copper (CAS 7440-50-8) Listed.

SARA 304 Emergency release notification
Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)
Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)
SARA 302 Extremely hazardous substance
Not listed.
SARA 311/312 Hazardous chemical
No
SARA 313 (TRI reporting)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>% by wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>1344-28-1</td>
<td>0.01 - 1</td>
</tr>
<tr>
<td>Antimony sulfide</td>
<td>1345-04-6</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>10 - 30</td>
</tr>
</tbody>
</table>

Other federal regulations
Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
Antimony sulfide (CAS 1345-04-6)
Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
Not regulated.

Safe Drinking Water Act (SDWA)
Not regulated.

US state regulations
US. Massachusetts RTK - Substance List
Aluminum oxide (CAS 1344-28-1)
Barium sulphate (CAS 7727-43-7)
Calcium dihydroxide (CAS 1305-62-0)
Copper (CAS 7440-50-8)
Graphite (CAS 7782-42-5)
Zirconium dioxide (CAS 1314-23-4)

US. New Jersey Worker and Community Right-to-Know Act
Aluminum oxide (CAS 1344-28-1)
Antimony sulfide (CAS 1345-04-6)
Barium sulphate (CAS 7727-43-7)
Calcium dihydroxide (CAS 1305-62-0)
Copper (CAS 7440-50-8)
Graphite (CAS 7782-42-5)
US. Pennsylvania Worker and Community Right-to-Know Law
- Aluminum oxide (CAS 1344-28-1)
- Antimony sulfide (CAS 1345-04-6)
- Barium sulphate (CAS 7727-43-7)
- Calcium dihydroxide (CAS 1305-62-0)
- Copper (CAS 7440-50-8)
- Graphite (CAS 7782-42-5)

US. Rhode Island RTK
- Aluminum oxide (CAS 1344-28-1)
- Antimony sulfide (CAS 1345-04-6)
- Barium sulphate (CAS 7727-43-7)
- Calcium dihydroxide (CAS 1305-62-0)
- Copper (CAS 7440-50-8)
- Graphite (CAS 7782-42-5)
- Poly (p-phenylenediamine terephthalamide) (CAS 26125-61-1)
- Zirconium dioxide (CAS 1314-23-4)

California Proposition 65
California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))
- Antimony sulfide (CAS 1345-04-6)
- Copper (CAS 7440-50-8)
- Poly (p-phenylenediamine terephthalamide) (CAS 26125-61-1)

International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A “Yes” indicates this product complies with the inventory requirements administered by the governing country(s). A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date: 29-June-2018
Revision date: -
Version #: 01
Further information: Dash "-"next to the NFPA ratings indicates Not Applicable.

NFPA ratings

List of abbreviations
- LD50: Lethal Dose, 50%.
- LC50: Lethal Concentration, 50%.

References
- HSDB® - Hazardous Substances Data Bank
- Registry of Toxic Effects of Chemical Substances (RTECS)
- IARC Monographs. Overall Evaluation of Carcinogenicity

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.