FERODO
THE FIRST NAME IN BRAKES

FEDERAL MOGUL

SAFETY DATA SHEET

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product name: General Disc Brake Pad

Supplier:
Federal Mogul Friction Products Limited
Hayfield Road, Chapel-en-le-Frith
High Peak, SK23 0JP, UK
TEL: +44 (0) 1298 811300

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

Intended use: Brake Pads

Contact person: P.G.Underhill - Product Manager
e-mail: Paul.Underhill@federalmogul.com

2 HAZARDS IDENTIFICATION

The product has been classified according to the legislation in force. Dust can be created by the machining of finished products.

Classification: | Carc. Cat. 2; R45 | Repro. Cat. 2; R60 | Repro. Cat. 2; R61 | Mut. Cat. 3; R68 | R42/43 |N; R51/53 |

The full text for all R-Phrases are displayed in section 16.

Potential health effects

Inhalation: High concentrations of dust may irritate throat and respiratory system and cause coughing. May cause sensitisation by inhalation.

Eye contact: Dust in the eyes will cause irritation.

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

Ingestion: May cause discomfort if swallowed.

Other health effects: May cause cancer. Limited evidence of a carcinogenic effect. May impair fertility. May cause harm to the unborn child.

Potential physical / chemical effects: The product is non-combustible.

Environment: Toxic 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 from the product by operations such as overheating, burning, machining, abrading, or riveting.

Chemical name	EC No.	CAS-No.	Concentration *	Classification	Notes
1,4-Benzenedicarbonyl dichloride, polymer with 1,4-benzenediamine	Polymer	26125-61-1	>= 1%	Xn;R48/20	-
Aluminium powder (stabilised)	231-072-3	7429-90-5	>= 1%	F;R11, F;R15	-
Antimony sulphide	215-713-4	1345-04-6	>= 1%	Xn;R20	-
Barium sulphate	231-784-4	7727-43-7	>= 1%	-	-
Barium zinc sulfate sulfide	215-715-5	1345-05-7	>= 1%	Xn;R20/22	-
Borax	215-540-4	1303-96-4	>= 1%	Xi;R36/37/38, Repro. Cat. 2;R60, Repro. Cat. 2;R61	-
Calcium dihydroxide	215-137-3	1305-62-0	>= 1%	C;R34	-
Calcium fluoride	232-188-7	7789-75-5	>= 1%	Xi;R36/37/38	-
Calcium oxide	215-138-9	1305-78-8	>= 1%	Xi;R38, Xi;R41	-
Carbon black	215-609-9	1333-86-4	>= 1%	-	-
Cellulose	232-674-9	9004-34-6	>= 1%	-	-
Diantimony trioxide	215-474-6	1309-64-4	>= 1%	Carc. Cat. 3;R40	-
Dichromium iron tetraoxide	215-159-3	1308-31-2	>= 1%	Xi;R43, Carc. Cat. 2;R49, N;R51/53	-
Limestone	215-279-6	1317-65-3	>= 1%	-	-
Magnesium oxide	215-171-9	1309-48-4	>= 1%	-	-
Methenamine	202-905-8	100-97-0	>= 1%	F;R11, Xn;R42, Xi;R43	-
Mica	310-127-6	12001-26-2	>= 1%	-	-
Molybdenum disulphide	235-721-1	1317-33-5	>= 1%	-	-
N-cyclohexylbenzothiazole-2-sulphenamide	202-411-2	95-33-0	>= 1%	R43, N;R50/53	-
Phenol, polymer with formaldehyde	500-005-2	9003-35-4	>= 1%	-	-
Refractory ceramic fibres	266-046-0	65997-17-3	>= 1%	-	-
Silicon compounds	206-991-8	409-21-2	>= 1%	-	-
Stearic acid	200-313-4	57-11-4	>= 1%	-	-
Sulphur	231-722-6	7704-34-9	>= 1%	F;R11	-
Thiram	205-286-2	137-26-8	>= 1%	Xn;R20/22, Xi;R36/38, Xi;R43, Xn;R48/22, N;R50/53	-
Tin	231-141-8	7440-31-5	>= 1%	-	-
Tin sulphide	215-248-7	1314-95-0	>= 1%	-	-
Titanium dioxide	236-675-5	13463-67-7	>= 1%	-	-
Trichloroethylene	201-167-4	79-01-6	>= 1%	Xi;R36/38, Carc. Cat. 2;R45, R67, Mut. Cat. 3;R68, R52/53	-
Triiron tetraoxide	215-277-5	1317-61-9	>= 1%	-	-
Wollastonite	237-772-5	13983-17-0	>= 1%	-	-
Zinc oxide	215-222-5	1314-13-2	>= 1%	N;R50/53	-
Zirconium dioxide	215-227-2	1314-23-4	>= 1%	-	-
Iron oxide	215-168-2	1309-37-1	>= 1%	-	-
Aluminium oxide	215-691-6	1344-28-1	>= 1%	-	-
Methacrylate ester	221-950-4	3290-92-4	>= 1%	Xi;R36/37/38	-
Copper	231-159-6	7440-50-8	>= 1%	-	-
Zinc powder - zinc dust	231-175-3	7440-66-6	>= 1%	N;R50/53	-

(stabilized)					
Graphite	231-955-3	7782-42-5	>= 1%	-	-
Zircon	239-019-6	14940-68-2	>= 1%	-	-
Kaolin	310-194-1	1332-58-7	>= 1%	-	-
Dipotassium titanate	432-240-0	12056-51-8	>= 1%	N;R50	-

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

The full text for all R-Phrases are displayed in section 16.

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: Flush thoroughly with water for at least 15 minutes. Dust in the eyes: Make sure to remove any contact lenses from the eyes before rinsing. Get medical attention if irritation persists after washing.

Skin contact: Wash contact areas with soap and water. Get medical attention promptly if symptoms 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.

Inappropriate 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 vapours may be formed.

Hazardous combustion products: Ammonia, Carbon dioxide, Carbon monoxide, Metal oxides, Metallic fumes, Nitrogen oxides, Sulfur oxides

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

6 ACCIDENTAL RELEASE MEASURES

Personal precautions: Avoid dust formation. Avoid inhalation of dust and contact with skin and eyes. Wear necessary protective equipment. See Section 8 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: Avoid discharge into water courses or onto the ground. Collect and dispose of spillage as indicated in section 13.

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 minimise dust production. Observe good industrial hygiene practices.

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

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values:

Chemical name	Source	Type	Workplace exposure limits	Notes
1,4-Benzenedicarbonyl dichloride, polymer with 1,4-benzenediamine (Respirable.)	EH40/2005	TWA	0.5 fibers/mL	
Aluminium powder (stabilised) (Respirable dust.)	EH40/2005	TWA	4 mg/m3	
Antimony sulphide	EH40/2005	TWA	0.5 mg/m3	as Sb
Barium sulphate (Inhalable dust.)	EH40/2005	TWA	10 mg/m3	
Barium sulphate (Respirable dust.)	EH40/2005	TWA	4 mg/m3	
Barium zinc sulfate sulfide	EH40/2005	TWA	0.5 mg/m3	as Ba
Borax	EH40/2005	TWA	5 mg/m3	
Calcium dihydroxide	EH40/2005	TWA	5 mg/m3	
Calcium fluoride	EH40/2005	TWA	2.5 mg/m3	as F
Calcium oxide	EH40/2005	TWA	2 mg/m3	
Carbon black	EH40/2005	STEL	7 mg/m3	
Carbon black	EH40/2005	TWA	3.5 mg/m3	
Cellulose (Inhalable dust.)	EH40/2005	STEL	20 mg/m3	
Cellulose (Inhalable dust.)	EH40/2005	TWA	10 mg/m3	
Cellulose (Respirable dust.)	EH40/2005	TWA	4 mg/m3	
Diantimony trioxide	EH40/2005	TWA	0.5 mg/m3	as Sb
Dichromium iron tetraoxide	EH40/2005	TWA	0.05 mg/m3	as Cr
Dichromium iron tetraoxide	EH40/2005	TWA	0.5 mg/m3	as Cr
Limestone (Respirable.)	EH40/2005	TWA	4 mg/m3	
Limestone (Inhalable)	EH40/2005	TWA	10 mg/m3	
Limestone (Inhalable dust.)	EH40/2005	TWA	10 mg/m3	
Limestone (Respirable dust.)	EH40/2005	TWA	4 mg/m3	
Magnesium oxide (Respirable dust and/or fume.)	EH40/2005	TWA	4 mg/m3	as Mg
Magnesium oxide (Inhalable dust.)	EH40/2005	TWA	10 mg/m3	as Mg
Mica (Respirable dust.)	EH40/2005	TWA	0.8 mg/m3	
Molybdenum disulphide (Insoluble)	EH40/2005	STEL	20 mg/m3	as Mo
Molybdenum disulphide (Soluble)	EH40/2005	STEL	10 mg/m3	as Mo
Molybdenum disulphide (Insoluble)	EH40/2005	TWA	10 mg/m3	as Mo
Molybdenum disulphide (Soluble)	EH40/2005	TWA	5 mg/m3	as Mo
Silicon compounds (Respirable.)	EH40/2005	TWA	4 mg/m3	
Silicon compounds (Inhalable)	EH40/2005	TWA	10 mg/m3	
Stearic acid	EH40/2005	TWA	10 mg/m3	

Tin sulphide	EH40/2005	STEL	4 mg/m3	as Sn
Tin sulphide	EH40/2005	TWA	2 mg/m3	as Sn
Titanium dioxide (Respirable.)	EH40/2005	TWA	4 mg/m3	
Titanium dioxide (Inhalable)	EH40/2005	TWA	10 mg/m3	
Trichloroethylene	EH40/2005	STEL	150 ppm 820 mg/m3	Skin
Trichloroethylene	EH40/2005	TWA	100 ppm 550 mg/m3	Skin
Zinc oxide (Fume.)	EH40/2005	STEL	10 mg/m3	
Zinc oxide (Respirable dust.)	EH40/2005	TWA	4 mg/m3	
Zinc oxide (Total inhalable dust.)	EH40/2005	TWA	10 mg/m3	
Zinc oxide (Fume.)	EH40/2005	TWA	5 mg/m3	
Zirconium dioxide	EH40/2005	STEL	10 mg/m3	as Zr
Zirconium dioxide	EH40/2005	TWA	5 mg/m3	as Zr
Aluminium oxide (Inhalable dust.)	EH40/2005	TWA	10 mg/m3	
Aluminium oxide (Respirable dust.)	EH40/2005	TWA	4 mg/m3	
Copper (Inhalable dusts and mists)	EH40/2005	STEL	2 mg/m3	as Cu
Copper (Fume.)	EH40/2005	TWA	0.2 mg/m3	
Copper (Inhalable dusts and mists)	EH40/2005	TWA	1 mg/m3	as Cu
Graphite (Respirable dust.)	EH40/2005	TWA	4 mg/m3	
Graphite (Inhalable dust.)	EH40/2005	TWA	10 mg/m3	
Iron oxide (Fume.)	EH40/2005	STEL	10 mg/m3	as Fe
Iron oxide (Fume.)	EH40/2005	TWA	5 mg/m3	as Fe
Iron oxide (Respirable.)	EH40/2005	TWA	4 mg/m3	
Iron oxide (Inhalable)	EH40/2005	TWA	10 mg/m3	
Kaolin (Respirable dust.)	EH40/2005	TWA	2 mg/m3	
Zircon	EH40/2005	STEL	10 mg/m3	as Zr
Zircon	EH40/2005	TWA	5 mg/m3	as Zr

Engineering controls: Provide adequate ventilation. Observe occupational exposure limits and minimise the risk of inhalation of dust.

Respiratory protection: During dust-raising work: Use respiratory equipment with particle filter, type P1. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

Eye protection: If contact is likely, safety glasses with side shields are recommended.

Hand protection: Gloves are recommended for prolonged use. 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.

Environmental exposure controls: Environmental manager must be informed of all major spillages.

9 PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid
Colour: Grey

Odour: Characteristic
Odour threshold: No data available.
pH: No data available
Melting point: No data available.
Freezing point: Not applicable
Boiling Point: No data available.
Relative density: 3 (20°C)
Bulk density: 0.3 g/cc - 0.8 g/cc
Vapour pressure: No data available.
Vapour density (air=1): No data available.
Evaporation rate: No data available.
Solubility in water: Insoluble
Solubility (other): No data available.
Partition coefficient (n-octanol/water): No data available.
Viscosity: Not applicable
Flash point: No data available.
Autoignition temperature: No data available.
Flammability limit - lower(%): No data available.
Flammability limit - upper (%): No data available.

10 STABILITY AND REACTIVITY

Stability: Material is stable under normal conditions.

Conditions to avoid: Heat.

Materials to avoid: Strong oxidising agents.

Hazardous decomposition products:

At elevated temperatures:	Ammonia, Formaldehyde, Metallic fumes, Nitrogen oxides, Sulfur oxides

Possibility of hazardous reactions: Will not occur.

11 TOXICOLOGICAL INFORMATION

Specified substance(s)
Acute toxicity:

Chemical name	Test results
Antimony sulphide	Oral LD50 (Rat): 2001 mg/kg
Antimony sulphide	Inhalation LC50 (4 hour(s), Rat): 5.04 mg/l
Antimony sulphide	Dermal LD50 (Rat): 2001 mg/kg
Borax	Oral LD50 (Rat): 2660 mg/kg
Calcium dihydroxide	Oral LD50 (Rat): 7340 mg/kg
Carbon black	Oral LD50 (Rat): >15400 mg/kg
Carbon black	Dermal LC50 (Rabbit): >3000 mg/kg
Cellulose	Dermal LD50 (Rabbit): >2 g/kg
Cellulose	Oral LD50 (Rat): >5 g/kg
Diantimony trioxide	Oral LD50 (Rat): >34600 mg/kg
N-cyclohexylbenzothiazole-2-sulphena	Oral LD50 (Rat): 5300 mg/kg

mide	
N-cyclohexylbenzothiazole-2-sulphenamide	Dermal LD50 (Rabbit): 7940 mg/kg
Phenol, polymer with formaldehyde	Oral LD50 (Rat): 5 g/kg
Stearic acid	Dermal LD50 (Rabbit): > 5000 mg/kg
Sulphur	Dermal LD50 (Rat): > 2020 mg/kg
Sulphur	Oral LD50 (Rat): > 5050 mg/kg
Thiram	Oral LD50 (Rat): 560 mg/kg
Thiram	Inhalation LC50 (4 hour(s), Rat): 500 mg/m3
Dipotassium titanate	Oral LD50 (Rat): >2000 mg/kg
Dipotassium titanate	Inhalation LC50 (Rat): >2000 mg/m3
Methacrylate ester	Dermal LD50 (Rabbit): 16 ml/kg
Methacrylate ester	Oral LD50 (Rat): 5660 ul/kg

Inhalation: High concentrations of dust may irritate throat and respiratory system and cause coughing.

Eye contact: Dust may irritate the eyes. Exposed may experience eye tearing, redness, and discomfort.

Skin contact: Mildly irritating to skin with prolonged exposure.

Ingestion: May cause discomfort if swallowed.

Sensitisation: May cause sensitisation by inhalation. May cause sensitisation by skin contact.

Carcinogenicity: May cause cancer.

Listed carcinogens:

Chemical name	IARC	NTP	OSHA	ACGIH
Magnesium oxide	Not listed	Not listed	Not listed	A4
Diantimony trioxide	2B	Not listed	Not listed	A2
Antimony sulphide	3	Not listed	Not listed	Not listed
Calcium fluoride	Not listed	Not listed	Not listed	A4
Titanium dioxide	2B	Not listed	Not listed	A4
Barium zinc sulfate sulfide	Not listed	Not listed	Not listed	A4
Borax	Not listed	Not listed	Not listed	A4
Iron oxide	3	Not listed	Not listed	A4
Dichromium iron tetraoxide	3	Listed	Listed	A1
Zircon	Not listed	Not listed	Not listed	A4
Aluminium oxide	Not listed	Not listed	Not listed	A4
Stearic acid	Not listed	Not listed	Not listed	A4
1,4-Benzenedicarbonyl dichloride, polymer with 1,4-benzenediamine	3	Not listed	Not listed	Not listed
Zirconium dioxide	Not listed	Not listed	Not listed	A4
Carbon black	2B	Not listed	Not listed	A4
Trichloroethylene	2A	Listed	Not listed	A2
Kaolin	Not listed	Not listed	Not listed	A4
Barium sulphate	Not listed	Not listed	Not listed	A4
Refractory ceramic fibres	Not listed	Listed	Not listed	A2
Wollastonite	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.

Mutagenesis: Possible risk of irreversible effects.

Reproductive toxicity: May impair fertility. May cause harm to the unborn child.

Other effects: High concentrations of copper dust can cause irritation of the upper respiratory tract.

12 ECOLOGICAL INFORMATION

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

Specified substance(s)

Chemical name	Test
Borax	LC50 (4 day(s), Rainbow trout): 27 ppm (m)
Methenamine	LC50 (48 hour(s), Daphnia): 36000 mg/l
Methenamine	LC50 (96 hour(s), Fathead minnow): 49800 mg/l
N-cyclohexylbenzothiazole-2-sulphenamide	LC50 (96 hour(s), Fish): 5.4 mg/l
N-cyclohexylbenzothiazole-2-sulphenamide	IC50 (96 hour(s), Green algae): 1.1 mg/l
Thiram	LC50 (Bluegill sunfish): 0.23 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.

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.

European waste codes
Unused product: 16 03 03*
Container:15 01 02

14 TRANSPORT INFORMATION

ADR/RID Not regulated.

IMDG Not regulated.

IATA Not regulated.

15 REGULATORY INFORMATION

Contains: Dichromium iron tetraoxide, Borax, Methenamine, Trichloroethylene

Toxic.

Dangerous for the environment.

R45; May cause cancer. R60; May impair fertility. R61; May cause harm to the unborn child. R42/43; May cause sensitisation by inhalation and skin contact. R68; Possible risk of irreversible effects.
R51/53; Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S24; Avoid contact with skin. S36/37; Wear suitable protective clothing and gloves. S60; This material and its container must be disposed of as hazardous waste.

Young people under 18 years old are not allow to work with this product according to the EU Directive 94/33/EC on the protection of young people at work. Pregnant women should not work with the product, if there is the least risk of exposure.

Chemical name	CAS-No.	List citations
Dichromium iron tetraoxide	1308-31-2	1
Trichloroethylene	79-01-6	1

Regulatory lists searched: 1 = Carcinogen

16 OTHER INFORMATION

Wording of the R-phrases in sections 2 and 3: R11; Highly flammable. R15; Contact with water liberates extremely flammable gases. R20; Harmful by inhalation. R22; Harmful if swallowed. R34; Causes burns. R36; Irritating to eyes. R37; Irritating to respiratory system. R38; Irritating to skin. R40; Limited evidence of a carcinogenic effect. R41; Risk of serious damage to eyes. R42; May cause sensitisation by inhalation. R43; May cause sensitisation by skin contact. R45; May cause cancer. R48/20; Harmful: danger of serious damage to health by prolonged exposure through inhalation. R48/22; Harmful: danger of serious damage to health by prolonged exposure if swallowed. R49; May cause cancer by inhalation. R50/53; Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R50; Very toxic to aquatic organisms. R51/53; Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R52/53; Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R60; May impair fertility. R61; May cause harm to the unborn child. R68; Possible risk of irreversible effects.

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Issue date: 12-Oct-2007
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