



MATERIAL SAFETY DATA SHEET

Prepared in accordance with ISO 11014-1/ ANSI standard
Z400.1-2004

Revision Date: 06/April/2007

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: **CARBON BLACK**

Synonyms: Carbon Black, Furnace Black

This SDS is valid for the following grades: Carbon Black grade series: BLACK PEARLS®, ELFTEx®, MOGUL®, MONARCH®, REGAL®, SPHERON®, STERLING®, VULCAN®, CSX™, CRX™, IRX™, UNITED®, MACHEM®. Oxidized grades include: BLACK PEARLS® / MOGUL® L, BLACK PEARLS® / MOGUL® E, MOGUL® H, BLACK PEARLS® / MONARCH® 1000,1300,1400,1500, REGAL® 400/400R. The foregoing are trademarks of the Cabot Corporation.
***Excludes: Monarch® 4750, Black Pearls® 4350/4750 and all oil pellet grades.**

Use of the Substance/Preparation: Various, Industrial Products

Supplier:
Cabot Corporation
157 Concord Road
Billerica, MA 01821
UNITED STATES
Tel: 1-978-670-6961
Fax: 1-978-670-6955

Emergency Telephone Number: US: CHEMTREC 1-800-424-9300 or 1-703-527-3887
US: Cabot 1-978-663-3455
Canada: CANUTEC 1-613-996-6666
Cabot (UK): (+44) 1446.736999

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW - CAUTION: Black powder or pellets. Dust may be irritating to eyes and respiratory tract. Do not expose to temperatures above 300°C. Hazardous products of decomposition and/or combustion can include carbon monoxide, carbon dioxide, oxides of sulfur, and organic products of decomposition.

Principle Routes of Exposure: Inhalation, Eye contact, Skin contact

POTENTIAL HEALTH EFFECTS

Eye Contact: May cause mechanical irritation. Irritating, but will not permanently injure eye tissue. Low hazard for usual industrial or commercial handling.

Skin Contact: No adverse effects expected.

Inhalation: Dust may be irritating to respiratory tract. Provide appropriate exhaust ventilation at machinery and at places where dust can be generated. See also Section 8.

Ingestion: Health injuries are not known or expected under normal use. Low hazard for usual industrial or commercial handling.

Carcinogenic Effects: Substance listed by IARC (International Agency for Research on Cancer). See also Section 11.

Target Organ Effects: Lungs**Medical Conditions Aggravated by Exposure:** Asthma, Respiratory disorder**Potential Environmental Effects:** No special environmental precautions required. Not soluble in water. See also Section 12.**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Chemical Name	CAS Number	EINECS Number	Weight %	EU Classification
Carbon Black	1333-86-4	215-609-9	100	None

4. FIRST AID MEASURES**Skin Contact:** Wash thoroughly with soap and water. Seek medical attention if symptoms develop.**Eye Contact:** Flush eyes immediately with large amounts of water for 15 minutes. Seek medical attention if symptoms develop.**Inhalation:** If cough, shortness of breath or other breathing problems occur, move to fresh air. Seek medical attention if symptoms persist. If necessary, restore normal breathing through standard first aid measures.**Ingestion:** Do not induce vomiting. If conscious, give several glasses of water. Never give anything by mouth to an unconscious person.**Notes to Physician:** Treat symptomatically.**5. FIRE AND IGNITION INFORMATION**

Flash Point:	Not applicable.
Explosion Limits in Air - Upper (%):	Not determined
Explosion Limits in Air - Lower (%):	50 g/m ³ (dust)
OSHA Flammability Classification:	Not applicable
Autoignition Temperature:	> 140°C (transport)
Method:	IMDG-Code
Minimum Ignition Temperature:	> 500°C (BAM Furnace) VDI 2263 > 315°C (Godberg-Greenwald Furnace) VDI 2263
Dust Explosion Classification:	ST 1 (VDI 2263)
Minimum Ignition Energy:	> 10,000 mJ
Method:	VDI 2263
Maximum Absolute Explosion Pressure:	10 bar at an initial starting pressure of 1 bar. Higher starting initial pressures will yield higher explosion pressures.
Method:	VDI 2263
Ignition Energy:	> 1 kJ
Method:	VDI 2263
Burn Velocity:	> 45 seconds (not classifiable as "Highly Flammable", or "Easily Ignitable")
Maximum Rate of Pressure Rise:	30 - 400 bar/sec
Method:	VDI 2263 and ASTM E1226-88

Extinguishing Media:	Use foam, carbon dioxide (CO ₂), dry chemical or water spray. A fog is recommended if water is used. DO NOT USE a solid water stream as it may scatter and spread fire.
Special Protective Equipment for Firefighters:	Wear suitable protective equipment. In the event of fire, wear self-contained breathing apparatus.
Specific Hazards:	It may not be obvious that carbon black is burning unless the material is stirred and sparks are apparent. Carbon black that has been on fire should be observed closely for at least 48 hours to ensure no smoldering material is present. Burning produces irritant fumes. The product is insoluble and floats on water. If possible, try to contain floating material. This material creates a fire hazard because it floats on water.
Hazardous Decomposition and/or Combustion Products:	Carbon monoxide, Carbon dioxide, Oxides of sulphur, Organic products of decomposition.
Risk of Dust Explosion:	Do not create a dust cloud by using a brush or compressed air.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:	CAUTION: Wet carbon black produces slippery walking surfaces. Avoid dust formation. Ensure adequate ventilation. Use personal protective equipment. See also Section 8.
Methods for Cleaning Up:	Clean up promptly by vacuum. Use of a vacuum with high efficiency particulate air (HEPA) filtration is recommended. Do not create a dust cloud by using a brush or compressed air. Pick up and transfer to properly labelled containers. See Section 13.
Environmental Precautions:	Do not allow material to contaminate ground water system. The product is insoluble and floats on water. If possible, try to contain floating material. Local authorities should be advised if significant spillages cannot be contained.

7. HANDLING AND STORAGE

Handling:	Avoid contact with skin and eyes. Do not breathe dust. Provide appropriate exhaust ventilation at machinery and at places where dust can be generated. Do not create a dust cloud by using a brush or compressed air. Fine dust is capable of penetrating electrical equipment and may cause electrical shorts. Take precautionary measures against static discharge.
Storage:	Keep in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Do not store together with strong oxidizing agents. Do not store together with volatile chemicals as they may be adsorbed onto product. Keep in properly labeled containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

The table below is a summary. Please see the specific legislation for complete information.

Carbon Black, CAS RN 1333-86-4:	Australia:	3.0 mg/m ³ , TWA
	Belgium - OEL:	3.6 mg/m ³ , TWA
	Canada:	3.5 mg/m ³ , TWA
	China:	4.0 mg/m ³ , TWA
		8.0 mg/m ³ , STEL
	Finland:	3.5 mg/m ³ , TWA
		7.0 mg/m ³ , STEL
	France - INRS:	3.5 mg/m ³ , TWA/VME
	Germany - TRGS 900:	3.0 mg/m ³ , respirable TWA
		10.0 mg/m ³ , inhalable TWA
	Germany - MAKs:	1.5 mg/m ³ , respirable TWA
		4.0 mg/m ³ , inhalable TWA
	Ireland:	3.5 mg/m ³ , TWA
		7.0 mg/m ³ , STEL
	Italy - OEL:	3.5 mg/m ³ , TWA
	Korea:	3.5 mg/m ³ , TWA
	Netherlands - MAC:	3.5 mg/m ³ , TWA
	Norway:	3.5 mg/m ³ , TWA
	Spain:	3.5 mg/m ³ , TWA
	Sweden - TLV:	3.0 mg/m ³ , TWA
	United Kingdom - WEL:	3.5 mg/m ³ , inhalable TWA (a)
		7.0 mg/m ³ , inhalable STEL
	US ACGIH - TLV:	3.5 mg/m ³ , TWA
	US OSHA - PEL:	3.5 mg/m ³ , TWA

Note: Unless otherwise indicated as "respirable" or "inhalable", the exposure limit represents a "total" value. The inhalable exposure limit has been demonstrated to be more restrictive than the total exposure limit, by a factor of approximately 3.

(a) - In its facilities globally, Cabot Corporation manages to the United Kingdom WEL of 3.5 mg/m³ inhalable TWA.

INRS: Institut National de Recherche et de Securite (National Institute of Research and Security)

MAC: Maximaal Aanvaarde Concentraties (Maximum allowed concentration)

MAK: Maximale Arbeitsplatzkonzentration (Maximum Workplace Concentration)

PEL: Permissible Exposure Limit

OEL: Occupational Exposure Limit

STEL: Short Term Exposure Limit

TLV: Threshold Limit Value

TRGS: Technische Regeln für Gefahrstoffe (Technical Rule for Hazardous Materials)

TWA: Time Weighted Average

US ACGIH: United States American Conference of Governmental Industrial Hygienists

US OSHA: United States Occupational Safety and Health Administration

VME: Valeur Moyenne d'Exposition (Average Level of Exposure)

WEL: Workplace Exposure Limit

ENGINEERING CONTROLS

Ensure adequate ventilation to maintain exposures below occupational limits.
Provide appropriate exhaust ventilation at machinery and at places where dust can be generated.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection:

An approved air-purifying respirator (APR) for particulates may be permissible where airborne concentrations are expected to exceed occupational exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air supplied respirator if there is any potential for uncontrolled release, exposure levels are not known, or any circumstances where air-purifying respirators may not provide adequate protection. Use of respirators must include a complete respiratory protection program in accordance with national standards and current best practices.

The following agencies/organizations approve respirators and/or criteria for respirator programs:

US: NIOSH approval under 42 CFR 84 required.

OSHA (29 CFR 1910.134). ANSI Z88.2-1992 (Respiratory Protection).

EU: CR592 Guidelines for the Selection and Use of Respiratory Protection.

Germany: DIN/EN 143 Respiratory Protective Devices for Dusty Materials.

UK: BS 4275 Recommendations for the Selection, Use and Maintenance of Respiratory Protective Equipment. HSE Guidance Note HS (G)53 Respiratory Protective Equipment.

Hand Protection:

Wear protective gloves to prevent soiling of hands.

Eye Protection:

Wear eye/face protection. Safety glasses with side-shields. Goggles.

Skin and Body Protection:

Wear suitable protective clothing. Wash clothing daily. Work clothing should not be allowed out of the workplace.

Other:

Handle in accordance with good industrial hygiene and safety practice. Emergency eyewash and safety shower should be located nearby.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Black Powder or Pellets
Odor:	None
pH:	4 - 11 [50 g/l water, 68°F (20°C)] (non-oxidized carbon black) 2 - 4 (oxidized carbon black)
Vapor Pressure:	Not determined
Boiling Point/Range:	Not applicable
Melting Point/Range:	Not applicable
Water Solubility:	Insoluble
Density:	1.7 - 1.9 g/cm ³ @ 20°C
Bulk Density:	20 - 550 kg/m ³
Specific Gravity:	Not determined
% Volatile (by Weight):	< 2.5% @ 950°C (non-oxidized carbon black) 2 - 11% (oxidized carbon black)

Evaporation Rate:	Not applicable
Viscosity:	Not determined
Partition Coefficient (n-octanol/water):	Not determined

10. STABILITY AND REACTIVITY

Stability:	Stable.
Reactivity:	May react exothermically upon contact with strong oxidizers.
Incompatible Materials:	Strong oxidizers such as chlorates, bromates, and nitrates.
Hazardous Polymerization:	Hazardous polymerization does not occur.
Mechanical Sensitivity (shock):	Not sensitive to mechanical impact.
Conditions to Avoid:	Do not expose to temperatures above 300°C. Keep away from oxidizing agents in order to avoid exothermic reactions.
Hazardous Decomposition and/or Combustion Products:	Carbon monoxide, Carbon dioxide, Oxides of sulphur, Organic products of decomposition.
Static Discharge Effects:	Take precautionary measures against static discharges. Avoid dust formation. All metal parts of the mixing and processing equipment must be earthed/grounded. Ensure all equipment is electrically earthed/grounded before beginning transfer operations.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Oral LD50: LD50/oral/rat = > 8000 mg/kg.

Eye Irritation: Rabbit. Draize score 10-17/110 @ 24 hr. Non-irritating.

Skin Irritation: Rabbit. 0.6/8. Slight irritation.

SUBCHRONIC TOXICITY

Rat, inhalation, duration 90 days

NOAEL = 1.0 mg/m³

Target organ: lungs

Effect: inflammation, hyperplasia, fibrosis.

CHRONIC TOXICITY

Rat, oral, duration: 2 years
Effect: no tumors

Mouse, oral, duration: 2 years
Effect: no tumors

Mouse, dermal, duration: 18 months
Effect: no skin tumors

Rat, inhalation, duration: 2 years
Target organ: lungs
Effect: inflammation, fibrosis, tumors

Note: Tumors in the rat lung are related to the fine particle overload phenomenon rather than to a specific chemical effect of the dust particles in the lung. These effects in rats have been reported in studies on other inorganic insoluble particles and appear to be species specific. Tumors have not been observed in other species (i.e., mouse and hamster) for other insoluble particles under similar circumstances and study conditions.

Carcinogenic Effects: Substance listed by IARC (International Agency for Research on Cancer). Does not contain any substances listed by NTP (National Toxicology Program), OSHA (Occupational Safety and Health Administration), ACGIH (American Conference for Governmental Industrial Hygienists) or EU (European Union).

Carbon Black IARC Statement: In 1995 International Agency for Research on Cancer (IARC) concluded, "There is inadequate evidence in humans for the carcinogenicity of carbon black." Based on rat inhalation studies, IARC concluded that there is "sufficient evidence in experimental animals for the carcinogenicity of carbon black", resulting in their classifying carbon black as "possibly carcinogenic to humans (Group 2B)".

Carbon black is not designated a carcinogen by the U.S. National Toxicology Program (NTP), the U.S. Occupational Safety and Health Administration (OSHA), the American Conference of Governmental Industrial Hygienists (ACGIH) or the European Union (EU).

The U.S. National Institute of Occupational Safety and Health (NIOSH) 1978 criteria document on carbon black recommends that only carbon blacks with polycyclic aromatic hydrocarbon (PAH) levels greater than 0.1% require the measurement of PAHs in air. As some PAHs are possible human carcinogens, NIOSH recommends an exposure limit of 0.1 mg/m³ for PAHs in air, measured as the cyclohexane-extractable fraction.

Epidemiology: Results of epidemiological studies of carbon black production workers suggest that cumulative exposure to carbon black may result in small decrements in lung function, as measured by FEV1. In addition to normal age related decline in the FEV1 of approximately 1200 ml over 40 years, according to a European investigation, exposure to 1 mg/m³ (inhalable fraction) of carbon black over a 40-year lifetime will result in an additional 48 milliliter (ml) decline in FEV1. A similar morbidity study in the United States suggested a 27 ml decline in FEV1 from a 1mg/m³ exposure over a 40-year period.

The relationship between symptoms and exposure to carbon black is less clear. In the U.S. study, 9% of the highest exposure group (in contrast to 5% of the unexposed group) reported symptoms consistent with chronic bronchitis. In the European study, methodological limitations in the administration of the questionnaire limit the drawing of definitive conclusions about symptoms. This study, however, indicated a link between carbon black and small opacities on the chest films, with negligible effects on lung function.

A study of carbon black workers in the UK showed an elevated incidence of lung cancer but it was not considered to be related to carbon black exposure. A study of workers at a large German carbon black manufacturing facility found increased lung cancer mortality among German carbon black workers, but found no apparent dose-response relationship between lung cancer mortality and several indicators of occupational exposure, including years of employment and carbon black exposure. The study concluded that the high lung cancer mortality could not be fully explained by selection, smoking, or other occupational risk factors, but the results also provided little evidence for an effect from carbon black exposure. A recent mortality study of US carbon black workers found no association between employment in carbon black production and lung cancer or any other type of cancer.

Mutagenic Effects: A dimethylsulfoxide (DMSO) suspension of carbon black produced negative results in an Ames test. Organic solvent extracts of carbon black, however, can contain traces of polycyclic aromatic hydrocarbons (PAH), which may affect the results in different in-vitro test systems. In an experimental investigation, mutational changes in the hprt gene were reported in alveolar epithelial cells in the rat following inhalation exposure to carbon black. This observation is believed to be rat specific and a consequence of "lung overload" (see Chronic Toxicity above).

Reproductive Toxicity: Did not show effects in animal experiments.

Sensitizing Effects: Contains no known sensitizers.

Synergistic Materials: None reasonably foreseeable.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity: Fish (Brachydanio rerio): LC50 (96hr) > 1,000 mg/L. (Method: OECD 203).
Daphnia magna: EC50 (24hr) > 5,600 mg/L. (Method: OECD 202).
Algae (Scenedesmus subspicatus): EC50 (72hr) > 10,000 mg/L.
Algae (Scenedesmus subspicatus): NOEC >= 10,000 mg/L.
Activated sludge: EC0 (3hr) >= 800 mg/L. (Method: DEV L3 TTC test).

ENVIRONMENTAL FATE

Mobility: Not expected to migrate. Insoluble.

Bioaccumulation: Not expected due to physicochemical properties of the substance.

Persistence / Degradability: Not expected to degrade.

Distribution to Environmental Compartments: Insoluble. Expected to remain on soil surface.

13. DISPOSAL CONSIDERATIONS

Disclaimer: Information in this section pertains to the product as shipped in its intended composition as described in Section 2 of this MSDS. Contamination or processing may change waste characteristics and requirements. Regulations may also apply to empty containers, liners or rinsate. State/provincial and local regulations may be different from federal regulations.

RCRA Classification (40 CFR 261): Not a hazardous waste.

Unused and Uncontaminated Product: Can be burned in suitable incineration plants or disposed of in a suitable landfill in accordance with the regulations issued by the appropriate federal, provincial, state and local authorities.

14. TRANSPORT INFORMATION

The following organizations do not classify carbon black as a "hazardous cargo" if it is "carbon, non-activated, mineral origin". Cabot carbon blacks meets this definition.

- Canadian Transport of Dangerous Goods Regulation
- European Transport of Dangerous Goods Regulation
- GGVS, GGVE, RID, ADR, IMDG Code, ICAO-TI
- United Nations (no UN number)
- US Department of Transportation

International Transportation Identification: "Carbon black, non-activated, mineral origin".
Not dangerous according to IMDG-Code.
Not dangerous according to ICAO-TI.

UN Number: None

UN Proper Shipping Name: Not classified

UN Shipping Class: Not classified

UN Packing Group: Not classified

US Rail Regulations: Not classified

15. REGULATORY INFORMATION**Hazard Classification****United States - OSHA (29 CFR 1910.1200):** Hazardous.**Mexico - NOM-018-STPS-2000:** Refer to HMIS Rating in Section 16.**Canada - WHMIS Classification (CPR, SOR/88-66):** Class D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Chemical Name	WHMIS Ingredient Disclosure List:
Carbon Black	Listed

International Inventories**All components of this product are listed on or exempt from the following inventories:**

- YES - Australian Inventory of Chemical Substances (AICS)
- YES - Canadian Domestic Substances List (DSL)
- YES - Chinese Inventory
- YES - European Inventory of Existing Commercial Chemical Substances (EINECS)
- YES - Japanese Existing and New Chemical Substances (ENCS)
- YES - Korean Existing Chemicals List (KECL)
- YES - New Zealand Hazardous Substances and New Organisms Act (HSNO)
- YES - Philippine Inventory of Chemicals and Chemical Substances (PICCS)
- YES - United States Toxic Substances Control Act (TSCA) Inventory

U.S. Federal Regulations**TSCA 12(b) Export Notification:** This product does not contain any components that are subject to TSCA 12(b) Export Notification.**Clean Air Act Amendments of 1990 (CAA, Section 112, 40 CFR 82):** This product does not contain any components listed as a Hazardous Air Pollutant, Flammable Substance, Toxic Substance, or Class 1 or 2 Ozone Depletor.**Clean Water Act (CWA, 40 CFR 116) Priority Pollutants:** This product does not contain any listed Priority Pollutants.**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, 40 CFR 302):** This product does not contain any listed Hazardous Substances.**Superfund Amendments and Reauthorization Act, Title III (SARA):****SARA Section 302 (40 CFR 355) Extremely Hazardous Substances:** No components are listed as extremely hazardous chemicals under SARA Section 302.**SARA Sections 311/312 (40 CFR 370) Hazard Category:** CHRONIC/DELAYED HEALTH HAZARD. Reporting may be required if the material is present at any one time in amounts equal to or greater than 10,000 pounds.**SARA Section 313 (40 CFR 372) Toxics Release Inventory:** Does not contain any of the substances identified under Section 313 as toxic chemicals in excess of the de minimis concentrations necessary to be subject to the supplier notification requirements.

Food and Drug Administration (FDA):

Carbon black is permitted for indirect contact with food and drugs when used as a filler in rubber articles intended for repeat use under 21 CFR (Code of Federal Regulations) 177.2600.

LIMITATIONS:

- Total carbon black (channel process and furnace process) in the rubber may not exceed 50% by weight of the rubber products. Cabot carbon blacks are furnace process blacks.

- Furnace process black content may not exceed 10% by weight of rubber product intended for use in contact with milk or edible oils.

Pharmaceutical Information: Not permitted

U.S. State Regulations

California Proposition 65: This product contains a component(s) that is listed on California Proposition 65.

California Proposition 65: "carbon black (airborne, unbound particles of respirable size)" is a California Proposition 65 listed substance. Please note that all three listing qualifiers (airborne, unbound (not bound within a matrix), and respirable size (10 micrometers or less in diameter)) must be met for this substance to be considered a Proposition 65 substance. Please contact your sales representative for additional information.

Louisiana: Right-to-know legislation requires inventory reporting through Community Right-to-Know when the quantity of carbon black exceeds 500 pounds on any given day. Spills or releases beyond the site of the facility of greater than 5,000 pounds are required to be immediately reported to the state Emergency Response Commission via the Office of the State Police, Transportation and Environmental Safety Section, Hazardous Material Hotline, (504) 925-6596 (collect calls accepted 24 hours a day).

US Coalition of NorthEastern Governors (CONEG) Metals List: This product meets the CONEG Source Reduction Council limits for the sum of the levels of lead, cadmium, mercury and hexavalent chromium of less than 100 parts per million by weight.

16. OTHER INFORMATION**HMIS Rating**

HMIS Index: * - chronic, 0 - minimal, 1 - slight, 2 - moderate, 3 - serious, 4 - severe

Health: *1

Flammability: 1

Physical Hazard: 0

Carbon Black Extracts:

Manufactured carbon blacks generally contain less than 0.1% of solvent extractable polycyclic aromatic hydrocarbons (PAH). Solvent extractable PAH content depends on numerous factors including, but not limited to, the manufacturing process, desired product specifications, and the analytical procedure used to measure and identify solvent extractable materials. Questions concerning PAH content of carbon black and analytical procedures should be addressed to your carbon black supplier.

General Information:

The carbon black industry continues to sponsor research designed to identify adverse health effects from long term exposure to carbon black. This MSDS will be updated as new safety and health information may become available.

Additional Contacts:

Prepared by: Cabot Corporation - Safety, Health and Environmental Affairs
Revision Date: 06/April/2007
Previous Revision Date: 18/July/2005
Reason for Revision: Revisions throughout

Disclaimer:

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