



SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)
Canada Hazardous Products Regulations (SOR/2015-17)

Revision date 09-Nov-2023

Revision Number 3

1. Identification

Product identifier

Product Name VULCAN® 9A32 Carbon Black

Other means of identification

Product Code(s) V9A32

Synonyms Carbon black, Furnace Black

Recommended use of the chemical and restrictions on use

Recommended use Additive/Filler for plastic and rubber, Pigment, Chemical reagent, Batteries, Refractories, Various

Restrictions on use Not recommended as a human tattooing pigment.

Details of the supplier of the safety data sheet

Cabot Canada Ltd. 800 Tashmoo Avenue Sarnia, Ontario N7T 7N4 Canada Tel: +1 519 336 2261 Fax: +1 519 339 8273	Cabot Corporation 4400 North Point Parkway Suite 200 Alpharetta, Georgia 30022 United States Tel: +1 678 297 1300 Fax: +1 678 297 1245
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Emergency telephone number

Emergency Telephone US: CHEMTREC : 1-800-424-9300 or +1-703-527-3887
International CHEMTREC: +1 703-741-5970 or +1-703-527-3887

2. Hazard(s) identification

Classification

Combustible dust	-
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Label elements

Signal word

Warning

Hazard statements

May form combustible dust concentrations in air

Precautionary Statements - Prevention

Keep away from all ignition sources including heat, sparks and flame
Prevent dust accumulations to minimize explosion hazard

Other information

May cause mechanical irritation. Dust may be irritating to respiratory tract. Do not expose to temperatures above 400 °C.

3. Composition/information on ingredients

Substance

Synonyms Carbon black, Furnace Black

Chemical name	CAS No	Weight-%	Hazardous Material Information Review Act registry number (HMIRA registry #)	Date HMIRA filed and date exemption granted (if applicable)
Carbon Black	1333-86-4	100	-	-

Additional information

HS Code: 2803.00.00

4. First-aid measures

Description of first aid measures

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.
Eye contact	In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if symptoms occur.
Skin contact	Wash skin with soap and water. Get medical attention if symptoms occur.
Ingestion	Do NOT induce vomiting. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Symptoms See Section 11 for additional Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. Fire-fighting measures

Suitable Extinguishing Media	Use foam, carbon dioxide (CO ₂), dry chemical or water spray. A fog is recommended if water is used.
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire. DO NOT USE high pressure media which could cause formation of a potentially explosible dust-air mixture.
Specific hazards arising from the chemical	It may not be obvious that carbon black is burning unless the material is stirred and embers and/or 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.
Hazardous combustion products	Carbon monoxide, Carbon dioxide (CO ₂), Oxides of sulfur
Explosion data	
Sensitivity to mechanical impact	None.
Sensitivity to static discharge	Dust can form an explosive mixture with air. Avoid generation of dust. Do not create a dust cloud by using a brush or compressed air. Take precautionary measures against static discharges. All

metal parts of the mixing and processing equipment must be earthed/grounded. Ensure all equipment is electrically earthed/grounded before beginning transfer operations.

Special protective equipment and precautions for fire-fighters

In case of fire: Wear self-contained breathing apparatus. Use personal protection equipment. Wet carbon black produces very slippery walking surfaces.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions

CAUTION: Wet carbon black produces very slippery walking surfaces. Avoid generation of dust. Ensure adequate ventilation. Use personal protection equipment. See section 8.

Other information

Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions

Local authorities should be advised if significant spillages cannot be contained. See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so. Contain spilled product on land, if possible. The product is insoluble and floats on water. Any product that reaches water should be contained.

Methods for cleaning up

If the spilled material contains dust or has the potential to create dust, use explosion-proof vacuums and/or cleaning systems suitable for combustible dusts. 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. Dry sweeping is not recommended. Water spray will produce very slippery walking surfaces and will not result in satisfactory removal of carbon black contamination. Pick up and transfer to properly labeled containers. See section 13.

7. Handling and storage

Precautions for safe handling

Advice on safe handling

Avoid contact with skin and eyes. Avoid generation of dust. Do not breathe dust. Provide appropriate local 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. Dust can form an explosive mixture with air.

Take precautionary measures against static discharges. All metal parts of the mixing and processing equipment must be earthed/grounded. Ensure all equipment is electrically earthed/grounded before beginning transfer operations. Fine dust is capable of penetrating electrical equipment and may cause electrical shorts. If hot work (welding, torch cutting, etc.) is required the immediate work area must be cleared of product and dust.

General hygiene considerations

Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat. Eliminate 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.

Carbon black is not classifiable as a Division 4.2 self-heating substance under the UN test criteria. However, the UN criteria for determining if a substance is self-heating is volume dependent, i.e., the auto-ignition temperature decreases with increasing volume. This classification may not be appropriate for large volume storage containers.

Before entering vessels and confined spaces containing carbon black, test for adequate oxygen, flammable gases and potential toxic air contaminants. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosible mixture if they are released in the atmosphere in sufficient concentrations.

8. Exposure controls/personal protection

Control parameters

Exposure Limits

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

Chemical name	Carbon Black 1333-86-4
ACGIH TLV	TWA: 3 mg/m ³ inhalable particulate matter
OSHA PEL	TWA: 3.5 mg/m ³ (vacated) TWA: 3.5 mg/m ³
Alberta	TWA: 3.5 mg/m ³
British Columbia	TWA: 3 mg/m ³ inhalable
Ontario	TWA: 3 mg/m ³ inhalable particulate matter
Quebec	TWA: 3 mg/m ³ inhalable dust

Other information

(1) 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.
(2) In its facilities globally, Cabot Corporation manages to the US ACGIH TLV of 3.0 mg/m³ TWA inhalable.

Appropriate engineering controls

Engineering controls

Ensure adequate ventilation to maintain exposures below occupational limits. Provide appropriate local exhaust ventilation at machinery and at places where dust can be generated. Ensure that eyewash stations and safety showers are close to the workstation location.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear safety glasses with side shields (or goggles).

Hand protection

No special glove composition (material, thickness) is required for carbon black and chemical breakthrough time considerations do not apply when selecting gloves. General duty gloves may be used to protect hands from carbon black soiling. Glove selection should be based on the task to be performed, dexterity requirements, and associated physical hand hazards (temperature, cuts, punctures, etc.), not chemical exposure. Use of a barrier cream may help prevent skin drying and minimize soiling. Wash hands and other exposed skin with mild soap and water.

Skin and body protection

Wear suitable protective clothing. Wash contaminated clothing before reuse. Contaminated work clothing should not be allowed out of the workplace.

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.

Environmental exposure controls In accordance with all local legislation and permit requirements.

General hygiene considerations Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state	Solid
Appearance	Black powder or pellets
Color	black
Odor	None
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	4 - 11	50 g/l water, 68°F (20°C), ASTM 1512. untreated carbon black
Melting point / freezing point		Not applicable
Boiling point / boiling range		Not applicable
Flash point		Not applicable
Evaporation rate		Not applicable
Flammability (solid, gas)	> 45 seconds	not classifiable as "Highly Flammable", or "Easily Ignitable"
Flammability Limit in Air		Not applicable
Vapor pressure		Not applicable
Relative vapor density		Not applicable
Relative density	1.7 - 2.2	@ 20 °C
Water solubility	insoluble	
Solubility(ies)	insoluble	
Partition coefficient		Not applicable
Autoignition temperature	> 400 °C	ASTM E2021-09, Dust layer
Decomposition temperature		Not applicable
Kinematic viscosity		Not applicable
Dynamic viscosity		Not applicable
Other information		
Minimum Explosive Conc.	50 g/m ³	dust
Minimum Ignition Temperature	> 500 °C	VDI 2263, BAM furnace, Dust cloud
Minimum Ignition Temperature - Layer	> 400 °C	VDI 2263
Minimum Ignition Energy	> 10000 mJ	VDI 2263
Maximum Pressure Rise	10 bar	10 bar at an initial starting pressure of 1 bar. Higher starting initial pressures will yield higher explosion pressures. VDI 2263
Maximum Rate of Pressure Rise	30-400 bar/sec	VDI 2263 and ASTM E1226-88
K_{st}	< 200 bar.m/s	VDI 2263
Explosive properties	Dust may form explosible mixture in air	Dust explosion category: ST 1
Oxidizing properties		Not applicable
Bulk density	200-680 kg/m ³	pellets
	20-380 kg/m ³	powder
% Volatile (by Weight)	<2.5%	950 °C, untreated carbon black

10. Stability and reactivity

Reactivity	May react exothermically upon contact with strong oxidizers.
Chemical stability	Stable under normal conditions. Stable under recommended storage conditions.
Possibility of hazardous reactions	None under normal processing.
Hazardous polymerization	Hazardous polymerization does not occur.
Conditions to avoid	Avoid generation of dust. Do not expose to temperatures above 400 °C. Keep away from heat. Eliminate sources of ignition.
Incompatible materials	Strong oxidizing agents
Hazardous decomposition products	Carbon monoxide, Carbon dioxide (CO ₂), Oxides of sulfur, Organic products of combustion

11. Toxicological information

Acute toxicity

Oral LD50	> 8000 mg/kg (rat); (Equivalent to OECD TG 401).
Dermal LD50	No data available.
Inhalation LC50	No data available.
Skin corrosion/irritation	Rabbit: not irritating. (Equivalent to OECD TG 404). Edema = 0 (max. attainable irritation score: 4). Erythema = 0 (max. attainable irritation score: 4). Assessment: Not irritating to skin.
Serious eye damage/eye irritation	Rabbit: not irritating. (OECD TG 405). Cornea: 0 (max. attainable irritation score: 4). Iris: 0 (max. attainable irritation score: 2). Conjunctivae: 0 (max. attainable irritation score: 3). Chemosis: 0 (max. attainable irritation score: 4). Assessment: Not irritating to the eyes.
Respiratory or skin sensitization	Guinea pig skin (Buehler Test): Not sensitizing (OECD 406). Assessment: Not sensitizing in animals. No cases of sensitization in humans have been reported.
Germ cell mutagenicity	<i>In Vitro</i> Carbon black is not suitable to be tested in bacterial (Ames test) and other in vitro systems because of its insolubility. However, when organic solvent extracts of carbon black have been tested, results showed no mutagenic effects. Organic solvent extracts of carbon black can contain traces of polycyclic aromatic hydrocarbons (PAHs). A study to examine the bioavailability of these PAHs showed that PAHs are very tightly bound to carbon black and not bioavailable. (Borm, 2005) <i>In Vivo</i> 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" (Driscoll, 1997) which led to chronic inflammation and release of reactive oxygen species. This is considered to be a secondary genotoxic effect and, thus, carbon black itself would not be considered to be mutagenic. Assessment: In vivo mutagenicity in rats occurs by mechanisms secondary to a threshold effect and is a consequence of "lung overload," which leads to chronic inflammation and the release of genotoxic oxygen species. This mechanism is considered to be a secondary genotoxic effect and, thus, carbon black itself would not be considered to be mutagenic.

Carcinogenicity**ANIMAL 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 considered to be related to the “lung overload” rather than to a specific chemical effect of carbon black itself in the lung. These effects in rats have been reported in many studies on other poorly soluble inorganic particles and appear to be rat specific (ILSI, 2000). Tumors have not been observed in other species (i.e., mouse and hamster) for carbon black or other poorly soluble particles under similar circumstances and study conditions.

MORTALITY STUDIES (HUMAN DATA):

A study on carbon black production workers in the UK (Sorahan, 2001) found an increased risk of lung cancer in two of the five plants studied; however, the increase was not related to the dose of carbon black. Thus, the authors did not consider the increased risk in lung cancer to be due to carbon black exposure. A German study of carbon black workers at one plant (Morfeld, 2006; Buechte, 2006) found a similar increase in lung cancer risk but, like the Sorahan, 2001 (UK study), found no association with carbon black exposure. A large US study of 18 plants showed a reduction in lung cancer risk in carbon black production workers (Dell, 2006). Based upon these studies, the February 2006 Working Group at the International Agency for Research on Cancer (IARC) concluded that the human evidence for carcinogenicity was inadequate (IARC, 2010).

Since the IARC evaluation of carbon black, Sorahan and Harrington (2007) have re-analyzed the UK study data using an alternative exposure hypothesis and found a positive association with carbon black exposure in two of the five plants. The same exposure hypothesis was applied by Morfeld and McCunney (2009) to the German cohort; in contrast, they found no association between carbon black exposure and lung cancer risk and, thus, no support for the alternative exposure hypothesis used by Sorahan and Harrington.

Overall, as a result of these detailed investigations, no causative link between carbon black exposure and cancer risk in humans has been demonstrated.

IARC CANCER CLASSIFICATION:

In 2006 IARC re-affirmed its 1995 finding that there is “inadequate evidence” from human health studies to assess whether carbon black causes cancer in humans. IARC concluded that there is “sufficient evidence” in experimental animal studies for the carcinogenicity of carbon black. IARC’s overall evaluation is that carbon black is “possibly carcinogenic to humans (Group 2B)”. This conclusion was based on IARC’s guidelines, which generally require such a classification if one species exhibits carcinogenicity in two or more animal studies (IARC, 2010).

Solvent extracts of carbon black were used in one study of rats in which skin tumors were found after dermal application and several studies of mice in which sarcomas were found following subcutaneous injection. IARC concluded that there was “sufficient evidence” that carbon black extracts can cause cancer in animals (Group 2B).

ACGIH CANCER CLASSIFICATION:

Confirmed Animal Carcinogen with Unknown Relevance to Humans (Category A3 Carcinogen).

ASSESSMENT:

Applying the guidelines of self-classification under the Globally Harmonized System of Classification and Labeling of Chemicals, carbon black is not classified as a carcinogen. Lung tumors are induced in rats as a result of repeated exposure to inert, poorly soluble particles like carbon black and other poorly soluble particles. Rat tumors are a result of a secondary non-genotoxic mechanism associated with the phenomenon of lung overload. This is a species-specific mechanism that has questionable relevance for classification in humans. In support of this opinion, the CLP Guidance for Specific Target Organ Toxicity – Repeated Exposure (STOT-RE), cites lung overload under mechanisms not relevant to humans. Human health studies show that exposure to carbon black does not increase the risk of carcinogenicity.

Reproductive toxicity

ASSESSMENT: No effects on reproductive organs or fetal development have been reported in long-term repeated dose toxicity studies in animals.

STOT - single exposure

ASSESSMENT: Based on available data, specific target organ toxicity is not expected after single oral, single inhalation, or single dermal exposure.

STOT - repeated exposure**ANIMAL TOXICITY:**

Repeated dose toxicity: inhalation (rat), 90 days, No Observed Adverse Effect Concentration (NOAEC) = 1.1 mg/m³ (respirable). Target organ effects at higher doses are lung inflammation, hyperplasia, and fibrosis.

Repeated dose toxicity: oral (mouse), 2 yrs, No Observed Effect Level (NOEL) = 137 mg/kg (body wt.)

Repeated dose toxicity: oral (rat), 2 yrs, NOEL = 52 mg/kg (body wt.)

Although carbon black produces pulmonary irritation, cellular proliferation, fibrosis, and lung tumors in the rat under conditions of "lung overload", there is evidence to demonstrate that this response is principally a species-specific response that is not relevant to humans.

MORBIDITY STUDIES (human data):

Results of epidemiological studies of carbon black production workers suggest that cumulative exposure to carbon black may result in small, non-clinical decrements in lung function. A U.S. respiratory morbidity study suggested a 27 ml decline in FEV1 from a 1 mg/m³ 8 hour TWA daily (inhalable fraction) exposure over a 40-year period (Harber, 2003). An earlier European investigation suggested that exposure to 1 mg/m³ (inhalable fraction) of carbon black over a 40-year working lifetime would result in a 48 ml decline in FEV1 (Gardiner, 2001). However, the estimates from both studies were only of borderline statistical significance. Normal age-related decline over a similar period of time would be approximately 1200 ml.

In the U.S. study, 9% of the highest non-smokers 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 conclusions that can be drawn about reported symptoms. This study, however, indicated a link between carbon black and small opacities on chest films, with negligible effects on lung function.

INHALATION ASSESSMENT:

Applying the guidelines of self-classification under GHS, carbon black is not classified under STOT-RE for effects on the lung. Classification is not warranted on the basis of the unique response of rats resulting from the "lung overload" following exposure to poorly soluble particles such as carbon black. The pattern of pulmonary effects in the rat, such as inflammation and fibrotic responses, are not observed in other rodent species, non-human primates, or humans under similar exposure conditions. Lung overload does not appear to be relevant for human health. Overall, the epidemiological evidence from well-conducted investigations has shown no causative link between carbon black exposure and the risk of non-malignant respiratory disease in humans. A

STOT-RE classification for carbon black after repeated inhalation exposure is not warranted.

ORAL ASSESSMENT:

Based on available data, specific target organ toxicity is not expected after repeated oral exposure.

DERMAL ASSESSMENT:

Based on available data and the chemical-physical properties (insolubility, low absorption potential), specific target organ toxicity is not expected after repeated dermal exposure.

Target organ effects

Lungs

Aspiration hazard

ASSESSMENT: Based on industrial experience and the available data, no aspiration hazard is expected.

Other adverse effects

No information available.

12. Ecological information

Ecotoxicity

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 (Method: OECD 201).
Activated sludge: EC0 (3hr) >= 800 mg/L. (Method: DEV L3 TTC test).

Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances.

Bioaccumulation

Not expected due to physicochemical properties of the substance.

Mobility

Insoluble. Not expected to migrate.

Other adverse effects

No information available.

13. Disposal considerations

Waste treatment methods

Waste from residues/unused products

Waste should not be released to sewers. Product, as supplied, can be burned in suitable incineration facilities or should be disposed of in accordance with the regulations issued by the appropriate federal, state and local authorities. Same consideration should be given to containers and packaging.

Contaminated packaging

Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable.

US EPA Waste Number

Canada: Not a hazardous waste under provincial regulations
Not a hazardous waste under U.S. RCRA, 40 CFR 261

14. Transport information

Note: Seven (7) ASTM reference carbon blacks were tested according to the UN method, Self Heating Solids, and found to be "Not a self-heating substance of Division 4.2"; the same carbon blacks were tested according to the UN method, Readily Combustible Solids, and found to be "Not a readily combustible solid of Division 4.1"; under current UN Recommendations on the Transport of Dangerous Goods.

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

DOT

Not regulated

<u>TDG</u>	Not regulated
<u>MEX</u>	Not regulated
<u>ICAO (air)</u>	Not regulated
<u>IATA</u>	Not regulated
<u>IMDG</u>	Not regulated
<u>RID</u>	Not regulated
<u>ADR</u>	Not regulated
<u>ADN</u>	Not regulated

15. Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories

TSCA Complies

Chemical name	CAS No	US TSCA Inventory listing	US TSCA inactive/active designation
Carbon Black	1333-86-4	Present	Active

DSL/NDSL Complies
 EINECS/ELINCS Complies
 ENCS Complies
 IECSC Complies
 KECL Complies
 PICCS Complies
 AICS Complies
 TCSI Complies
 NZIoC Complies

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances

TCSI - Taiwan Chemical Substance Inventory

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

TSCA Section 12(b) Export Regulations

This product does not contain any components that are subject to TSCA 12(b) Export Notification.

SARA 313

Metals and Polycyclic Aromatic Compounds (PACs) that are listed under EPA's Toxics Release Inventory (TRI) are not intentionally added but

may be present as impurities in Cabot's carbon black products in trace concentrations. Cabot does not analyze for these chemicals for all carbon black products. However, to the best of our knowledge for PACs and metals that require reporting under TRI, the concentration for those compounds that are listed as carcinogenic or PBT (persistent, bioaccumulative and toxic) are less than 0.1%. For other TRI metals the concentration is less than 1%.

SARA 311/312 Hazard Categories

Sections 311/312 apply if Carbon Black is present at any one time in amounts equal to or greater than 10,000 pounds. Under Section 311/312 – SDS requirements, carbon black is determined to be hazardous according to the following EPA hazard categories: Combustible Dust.

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.

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals:

- "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.
- Certain polycyclic aromatic hydrocarbons (PAHs) that may be found adsorbed onto the surface of carbon black are California Proposition 65 listed substances.
- "Carbon-black extracts" is a California Proposition 65 listed substance.
- Certain metals, including arsenic, cadmium, lead, mercury, or nickel, may be present on and/or in carbon black and are California Proposition 65 listed substances.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Carbon Black 1333-86-4	X	X	X

16. Other information

Key or legend to abbreviations and acronyms used in the safety data sheet

Legend Section 8: Exposure controls/personal protection

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation

Key literature references and sources for data used to compile the SDS

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Buechte, S, Morfeld, P, Wellmann, J, Bolm-Audorff, U, McCunney, R, Piekarski, C. (2006) Lung cancer mortality and carbon black exposure – A nested case-control study at a German carbon black production plant. *J.Occup. Env.Med.* 12: 1242-1252.

Dell, L, Mundt, K, Luipold, R, Nunes, A, Cohen, L, Heidenreich, M, Bachand, A. (2006) A cohort mortality study of employees in the United States carbon black industry. *J.Occup. Env. Med.* 48(12): 1219-1229.

Driscoll KE, Deyo LC, Carter JM, Howard BW, Hassenbein DG and Bertram TA (1997) Effects of particle exposure and particle-elicited

inflammatory cells on mutation in rat alveolar epithelial cells. Carcinogenesis 18(2) 423-430.

Gardiner K, van Tongeren M, Harrington M. (2001) Respiratory health effects from exposure to carbon black: Results of the phase 2 and 3 cross sectional studies in the European carbon black manufacturing industry. Occup. Env. Med. 58: 496-503.

Harber P, Muranko H, Solis S, Torossian A, Merz B. (2003) Effect of carbon black exposure on respiratory function and symptoms. J. Occup. Env. Med. 45: 144-55.

ILSI Risk Science Institute Workshop: The Relevance of the Rat Lung Response to Particle to Particle Overload for Human Risk Assessment. Inh. Toxicol. 12:1-17 (2000).

International Agency for Research on Cancer: IARC Monographs on the Evaluation of Carcinogenic Risks to Humans (2010), Vol. 93, February 1-14, 2006, Carbon Black, Titanium Dioxide, and Talc. Lyon, France.

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Morfeld P and McCunney RJ, (2009). Carbon Black and lung cancer testing a novel exposure metric by multi-model inference. Am. J. Ind. Med. 52: 890-899.

Sorahan T, Hamilton L, van Tongeren M, Gardiner K, Harrington JM (2001). A cohort mortality study of U.K. carbon black workers, 1951-1996. Am. J. Ind. Med. 39(2):158-170.

Sorahan T, Harrington JM (2007) A “Lugged” Analysis of Lung Cancer Risks in UK Carbon Black Production Workers, 1951–2004. Am. J. Ind. Med. 50, 555–564.

Prepared By Cabot Corporation - Safety, Health and Environmental Affairs.

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End of Safety Data Sheet