

Safety Data Sheet

ACCORDING TO THE GLOBALLY HARMONIZED SYSTEM
OF CLASSIFICATION AND LABELING OF CHEMICALS (GHS)

Material Name/Synonyms: Tire Derived Carbon (TDC), Bolder Black™

1. Product and Company Identification

1.1 Product Identification

Chemical Name: Carbon Black
Chemical Family: Carbon
CAS#: 1333-86-4
Chemical Formula: C
Product Form: Powder or Beads

1.2 Manufacturer

Maryville Carbon Solutions
600 Wilson Industrial Road
Maryville, MO 64468
U.S.A

Telephone Number: (660) 562-2030

1.3 Emergency Telephone Numbers

DOMESTIC NORTH AMERICA 800-424-9300 (CHEMTREC)
INTERNATIONAL, CALL +1 703-527-3887 (collect calls accepted)

Use of Substance/Preparation: Additive for plastic and rubber, electrostatic discharge (ESD) compounds, coatings, toners/inks, additive for batteries, various other uses.

2. Hazards Identification

2.1 Globally Harmonized System of Classification and Labeling GHS Hazard Classification

Not a hazardous substance or preparation according to the Global Harmonized System (GHS)

In 1995 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". IARC's overall evaluation was that "Carbon black is possibly carcinogenic to humans (Group 2B)." This conclusion was based on IARC's guidelines, which require such a classification if one animal species exhibits carcinogenicity in two or more studies. Lung tumors in rats are the result of exposure under "lung overload" conditions. The development of lung tumors in rats is specific to this species. Mouse and hamster showed no carcinogenicity in similar studies.

In 2006 IARC re-affirmed its 1995 classification of carbon black as Group 2B (possibly carcinogenic to humans).

Overall, as a result of the detailed epidemiological investigations, no causative link between carbon black exposure and cancer risk in humans has been demonstrated. This view is consistent with the IARC

evaluation in 2006. Furthermore, several epidemiological and clinical studies of workers in the carbon black production industries show no evidence of clinically significant adverse health effects due to occupational exposure to carbon black. No dose response relationship was observed in workers exposed to carbon black.

Applying the rules of the Globally Harmonized System of Classification and Labelling (GHS, e.g. UN 'Purple Book', EU CLP Regulation) the results of repeated dose toxicity and carcinogenicity studies in animals do not lead to classification of Carbon Black for Specific Target Organ Toxicity (Repeated exposure) and carcinogenicity¹. UN GHS says, that even if adverse effects are seen in animal studies or in-vitro tests, no classification is needed if the mechanism or mode of action is not relevant to humans². The European CLP Regulation also mentions, that no classification is indicated if the mechanism is not relevant to humans³. Furthermore, the CLP guidance on classification and labelling states, that "lung overload" in animals is listed under mechanism not relevant to humans⁴.

2.1.1	GHS Symbol	NOT APPLICABLE
2.1.2	GHS Signal Words	NOT APPLICABLE
2.1.3	GHS Hazard Statements	NOT APPLICABLE
2.1.4	GHS Precautionary Statements	NOT APPLICABLE

2.2 Other Hazard Classifications

- 2.2.1 Brazil: Not classified as a hazardous substance under Note 1 of the "Portaria ANTT 420 e Provisao Especial Nº 223" Classe 4.2.
- 2.2.2 Canada: This material is classified as D2A under Canadian Worker Hazardous Materials Information System (WHMIS) criteria.
- 2.2.3 European Nation: Not a hazardous substance or preparation according to the Global Harmonized System (GHS), see Section 2.1.
- 2.2.4 United States: Classified as hazardous by definition under OSHA 29 CFR 1910.1200 (all chemicals that have been assigned a Permissible Exposure Limit under 29 CFR 1910.1000 are to be considered hazardous).

2.3 Most Important Hazards

A black, odorless, insoluble, powder that can burn or smolder at temperatures greater than 572 °F (>300 °C). Hazardous products of decomposition can include carbon monoxide, carbon dioxide, and oxides of sulfur. May cause reversible mechanical irritation to the eyes and respiratory tract especially at concentrations above the occupational exposure limit. Some grades of carbon black are sufficiently electrically non-conductive to allow a build-up of static charge during handling. Take measures to prevent the build-up of electrostatic charge.

2.4 Routes of Exposure

Skin, Eye, Inhalation

2.5 Potential Health Effects

- 2.5.1 Inhalation: Temporary discomfort to upper respiratory tract may occur due to mechanical irritation when exposures are well above the occupational exposure limit. Long-term exposure below the current occupational exposure limit of 3.5 mg/m³ may result in a small loss in one aspect of lung function (FEV1).
- 2.5.2 Acute Ingestion: No evidence of adverse effects from available data.
- 2.5.3 Acute Eye: High dust concentrations may cause mechanical irritation to eye.
- 2.5.4 Acute Skin: May cause mechanical irritation, soiling, and skin drying.
- 2.5.5 Sensitization No cases of sensitization in humans have been reported.
- 2.5.6 Carcinogenicity IARC listed; Group 2B (possibly carcinogenic to humans). Not listed as a carcinogen by NTP, ACGIH, OSHA or the European Union. There are no known human

carcinogenic effects related to the PAH content of carbon blacks. Recent research has shown that the PAH content of carbon blacks is not released in biological fluids and thus not available for biological activity.

2.6 Potential Environmental Effects

No significant environmental hazards are associated with carbon black release to the environment. Carbon black is not soluble in water. See Section 12.

3. Composition/Information on Ingredients

Component	CAS #	Concentration (Percent by Weight)
Carbon Black, amorphous	1333-86-4	> 80
Water (Moisture)	7732-18-5	<1
Mineral ash	NA	< 15
Sulfur species	NA	< 5
Polyaramid or Polyester Fibers	NA	< 1
Glass Fibers	65997-17-3	< 1

3.1 Chemical Formula: C

3.2 CAS Number: 1333-86-4

3.3 EINECS Number: 215-609-9

3.4 Volatile Matter: This carbon black contains 2-5% volatile matter or chemisorbed oxygen. Carbon blacks containing more than 8% volatile matter may form an explosive dust-air mixture. Manufactured carbon blacks do not exceed 8% volatile materials content (unless otherwise noted by the supplier on package and SDS). See Section 9, Chemical and Physical Properties.

4. First Aid Measures

4.1 Inhalation

Take affected persons into fresh air. If necessary, restore normal breathing through standard first aid measures.

4.2 Skin

Wash skin with mild soap and water. If symptoms develop, seek medical attention.

4.3 Eye

Rinse eyes thoroughly with large volumes of water keeping eyelids open. If symptoms develop, seek medical attention.

4.4 Ingestion

Do not induce vomiting. If conscious, give several glasses of water. Never give anything by mouth to an unconscious person.

4.5 Note to Physicians

Treat symptomatically

5. Fire Fighting Measures

5.1 Extinguishing Media

Use foam, carbon dioxide (CO₂), dry chemical or water fog. A fog spray is recommended if water is used. DO NOT USE HIGH PRESSURE WATER STREAM as this may spread burning powder (burning powder will float).

5.2 Special Exposure 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. Products of combustion include carbon monoxide (CO), carbon dioxide (CO₂), and oxides of sulfur.

5.3 Protection of Firefighters

Wear full protective fire-fighting gear including self-contained breathing apparatus (SCBA). WET CARBON BLACK PRODUCES VERY SLIPPERY WALKING SURFACES.

6. Accidental Release Measures

NOTE: WET CARBON BLACK PRODUCES SLIPPERY WALKING SURFACES.

6.1 Personal Precautions

Wear appropriate personal protective equipment and respiratory protection. See Section 8. 6.2

6.2 Environmental Precautions

Carbon black poses no significant environmental hazards. As a matter of good practice, minimize contamination of sewage water, soil, groundwater, drainage systems, or bodies of water.

6.3 Methods for Cleanup

Small spills should be vacuumed when possible. Dry sweeping is not recommended. A vacuum equipped with HEPA (high efficiency particulate air) filtration is recommended. If necessary, light water spray will reduce dust for dry sweeping. Large spills may be shoveled into containers. See Section 13.

6.4 Methods for Containment

In the US, Carbon Black is not a hazardous substance under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, 40 CFR 302), or the Clean Water Act (40 CFR 116), or a hazardous air pollutant under the Clean Air Act Amendments of 1990 (CAA 40 CFR).

7. Handling and Storage

7.1 Handling

Avoid dust exposures above the occupational exposure limit. Wash exposed skin daily. Use engineering controls to limit exposures to below the occupational exposure limits. Fine dust may cause electrical shorts and is capable of penetrating electrical equipment unless tightly sealed. If hot work (welding, torch cutting, etc.) is required the immediate work area must be cleared of carbon black product and dust.

7.2 Storage

Store in a dry place away from ignition sources and strong oxidizers. Before entering closed vessels and confined spaces containing carbon black test for adequate oxygen, flammable gases and potential toxic air contaminants (e.g. CO). Follow safe practices when entering confined spaces. Carbon black is not classifiable as a Division 4.2 self-heating substance under the UN test criteria. However, these criteria are volume dependent, i.e., the auto-ignition temperature decreases with increasing volume. This classification may not be appropriate for large volume storage containers.

8. Exposure Controls/Personal Protection

8.1 Exposure Limit Values

Governing Body	Value
DNEL/DMEL Values	2.0 mg/m ³ inhalable; 0.5 mg/ m ³ respirable
US ACGIH - TLV	3.0 mg/m ³ inhalable TWA
US OSHA - PEL	3.5 mg/m ³ inhalable TWA
Australia	3.0 mg/m ³ inhalable TWA
Brazil	3,5 mg/m ³ inhalable TWA
Canada	3.5 mg/m ³ inhalable TWA
Korea	3.5 mg/m ³ inhalable TWA

8.2 Engineering Controls

Use process enclosures and/or exhaust ventilation to keep airborne dust concentrations below the occupational exposure limit.

8.3 Personal Protective Equipment (PPE)

- 8.3.1 Respiratory: Approved particulate respirators should be used where airborne concentrations are expected to exceed occupational exposure limits.
- 8.3.2 Hand Protection: Wash hands and other exposed skin with mild soap. Use of a barrier cream may help to prevent skin drying. General protective gloves may be used to protect hands from carbon black soiling.
- 8.3.3 Eye Protection: Wear safety glasses or goggles.
- 8.3.4 Skin Protection: Wear general protective clothing to minimize skin contact. Work clothes should not be taken home and should be washed daily.
- 8.3.5 General Hygiene: Considerations Emergency eyewash and safety shower should be in close proximity. Wash hands and face thoroughly with mild soap before eating and drinking.

9. Physical & Chemical Properties

9.1 General Properties

Parameter	Value/Measurement	Parameter	Value/Measurement
Physical state and appearance	Powder, grain or pellet	Bulk density	Powder: 6 – 9 lbs/ft ³ Pellets: 27 – 33 lbs/ft ³
Odor	Odorless	Color	black
Vapor Density (Air=1)	Not applicable	Solubility (H ₂ O)	Insoluble in Water
Molecular Formula	C	pH:	6.5-7.5
Molecular Weight (as Carbon)	12	Octanol/H ₂ O Coefficient	Not applicable
Melting Point/Range	Not applicable	Kinematic Viscosity @ 40 °C:	Not applicable
Boiling Point:	Not applicable	Specific Gravity (Water=1)	1.7-1.9
Vapor Pressure	Not applicable	Odor threshold	Not applicable

9.2 Flammable and Explosive Properties

Parameter	Value	Notes
Flammability	Not Applicable	As defined by OSHA 1910.1200
Auto-Ignition Temperature	>284°F (for transport)	
Minimum Ignition Temperature BAM Furnace	>500°C (>932°F)	(VDI 2263)
Godbert-Greenwald Furnace	>315°C (> 600°F)	(VDI 2263)
Decomposition Temperature	300°C (572°F)	
Minimum Ignition Energy	>10J	
Burn Rate	>45s	(VDI 2263, EC 84/449). Not classified as "Highly Flammable" or "Easily Ignitable"
Dust Explosion Class	ST1	(VDI 2263)

10. Stability and Reactivity

10.1 Stability

Stable under normal ambient conditions; decomposition: >300°C (>572°F)

10.2 Conditions to Avoid

Prevent exposure to high temperatures >300°C (>572°F) and open flames.

10.3 Materials to Avoid

Strong oxidizers such as chlorates, bromates and nitrates.

10.4 Hazardous Decomposition Products

Carbon monoxide, carbon dioxide, organic products of decomposition, oxides of sulfur (sulfoxides) form if heated above decomposition temperature.

10.5 Hazardous Polymerization

Will not occur.

10.6 Mechanical Sensitivity (Shock)

Not sensitive to mechanical impact.

10.7 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. When transferring material at locations where flammable gases or vapours can be present, ensure that all equipment is electrically earthed/grounded before beginning transfer operations.

11. Toxicological Information

11.1 Acute Toxicity

Carbon Black (1333-86-4)

Acute Oral Toxicity: LD₅₀ (rat), >800 mg/kg

Primary Irritation

Skin (Rabbit): Non-irritative, index score 0.6/8 (4.0 = severe edema)

Eye (Rabbit): Non-irritative, Draize score 10-17/110 (100 maximally irritating)

Sensitization: No evidence of sensitization was found in animals. No cases of sensitization in humans have been reported.

11.2 Subchronic Toxicity

Carbon Black (1333-86-4)

Rat, inhalation, duration 90 days: Effect: inflammation, hyperplasia, fibrosis.
Target Organ: Lungs; NOAEL = 1.0 mg/cubic meter (respirable).

11.3 Chronic Toxicity - General Material Information

Carbon Black (1333-86-4)

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
Mouse/hamster, inhalation, duration 2 y. Target organ: lungs No tumors

Note: Effects in the rat lung are considered to be related to the “lung overload phenomenon”^{1,6-9}) 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.

11.4 Carcinogenicity Classification

11.4.1 GHS

Not a hazardous substance or preparation according to the Global Harmonized System (GHS). See section 2.1.

11.4.2 IARC

In 1995 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,” IARC’s overall evaluation was that, “Carbon black is possibly carcinogenic to humans (Group 2B)”. This conclusion was based on IARC’s guidelines, which require such a classification if one species exhibits carcinogenicity in two or more studies. IARC performed another review in 2006, and again classified carbon black as possibly carcinogenic to humans (Group 2B). In its 1987 review IARC concluded, “There is sufficient evidence in experimental animals for the carcinogenicity of carbon black extracts.” Carbon black extracts are classified as, possibly carcinogenic to humans (Group 2B).

11.4.3 NTP

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

11.4.4 ACGIH

The American Conference of Governmental Industrial Hygienists classifies carbon black as A4, Not Classifiable as a Human Carcinogen.

11.4.5 NIOSH

The U.S. National Institute of Occupational Safety and Health (NIOSH) 1978 criteria document on carbon black recommends that only carbon blacks with PAH contaminant 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.

11.5 Specific Target Organ Toxicity Classification (STOT)

Inhalation studies with the rat showed lung effects (see Section 11.2 and 11.3), these effects are believed to be the effects of “lung overload” 1 and these effects are believed to be specific to the species. In addition, the European CLP Regulation states that no classification is necessary if the mechanism is not relevant to humans. 4) Also, the CLP Guidance on classification and labeling states that the “lung overload” mechanism is not relevant to humans. 4) Therefore, no STOT, Repeated Exposure classification is made.

11.6 Sensitization No animal data is available.

No cases in humans have been reported.

11.7 Mutagenic Effects and Germ Cell Mutagenicity

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" which led to chronic inflammation and 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. Carbon black is not suitable to be tested in bacterial (Ames test) and other in vitro systems because of its insolubility in aqueous solutions. When tested, however, results for carbon black showed no mutagenic effects. Organic solvent extracts of carbon black can, however, 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.⁵

11.8 Reproductive and Teratogenic Effects

No experimental studies on effects of carbon black on fertility and reproduction have been located. However, based on toxicokinetic data, carbon black is deposited in the lungs and based on its specific physicochemical properties (insolubility, low absorption potential), it is not likely to distribute in the body to reach reproductive organs, embryo and/or foetus under in vivo conditions. Therefore, no adverse effects of carbon black to fertility/reproduction or to foetal development are expected. No effects have been reported in longterm animal studies.

11.9 Human 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. A recent U.S. respiratory morbidity study suggested a 27 mL decline in FEV1 from a 1 mg/m³ (inhalable fraction) exposure over a 40-year period. An older European investigation suggested an exposure to 1 mg/m³ (inhalable fraction) of carbon black over a 40-year working-lifetime will result in a 48 mL decline in FEV1. In contrast, normal age related decline over a similar period of time would be approximately 1200 mL.

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 chest films, with negligible effects on lung function.

A study on carbon black production workers in the UK¹⁰ 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 plant¹¹⁻¹⁴ found a similar increase in lung cancer risk but, like the 2001 UK study¹⁰, found no association with carbon black exposure. In contrast, a large US study¹⁵ of 18 plants showed a reduction in lung cancer risk in carbon black production workers. Based upon these studies, the February 2006 Working Group at IARC concluded that the human evidence for carcinogenicity was inadequate¹.

Since this IARC evaluation of carbon black, Sorahan and Harrington¹⁶ 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 McCunney¹⁷⁻¹⁸ 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 Harrington¹⁶. Morfeld and McCunney¹⁹ applied a Bayesian approach to unravel the role of uncontrolled confounders and identified smoking and prior exposure to occupational carcinogens received before being hired in the carbon black industry as main causes of the observed lung cancer excess risk.

Overall, as a result of these detailed investigations, no causative link between carbon black exposure and cancer risk in humans has been demonstrated. This view is consistent with the IARC evaluation in 2006.

Several epidemiological and clinical studies of workers in the carbon black production industries show no evidence of clinically significant adverse health effects due to occupational exposure to carbon black.

No dose response relationship was observed in workers exposed to carbon black.

12. Ecological Information

Carbon black is substantially elemental carbon, inorganic and cannot be further biodegraded by microorganisms. It is inert and contains no functional or water-soluble groups. It cannot be further degraded by hydrolysis, light or by photodegradation in air or in surface water.

12.1 Aquatic Toxicity		
Toxicity Type	Value, Species	Guideline
12.1.1 Acute Algae	EC 50 (72h) > 10,000 mg/L, Scenedesmus subspicatus	OECD Guideline 201
	NOEC 50 > 10,000 mg/L, Scenedesmus subspicatus	OECD Guideline 201
12.1.2 Acute Fish	LC ₅₀ (96h) > 1,000 mg/L, Brachydanio rerio (zebrafish)	OECD Guideline 203
12.1.3 Acute Water Flea	EC ₅₀ (24h) > 5,600 mg/L, Daphnia magna (waterflea)	OECD Guideline 202

12.2 Behavior in Water Treatment Plants

Activated sludge, EC₀ (3 h) > 800 mg/L. DEV L3 (TTC test)

12.3 Environmental Fate

Carbon black is an inert solid, stable and insoluble in water or organic solvents. Its vapor pressure is negligible. Based on these properties it is expected that carbon black will not occur in air or water in relevant amounts. Also potential for distribution via water or air can be dismissed. The deposition in soil or sediments is therefore the most relevant compartment of fate in the environment.

12.4 Bioaccumulation

Potential bioaccumulation is not expected because of the physicochemical properties of the substance.

13. Disposal Considerations

General Material Information

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. **Waste Codes and**

Classification

EU: EU Waste Code No. 61303 per Council Directive 75/422/EEC **U.S.:** Not a hazardous waste under U.S. RCRA, 40 CFR 261. **Canada:** Not a hazardous waste under provincial regulations.

14. Transportation Information

United States Department of Transportation Hazardous Materials Regulations (DOT): Not restricted.

Shipping Name: Carbon Black.

Canadian Transport of Dangerous Goods (TDG): Not restricted. Shipping Name: Carbon Black.

European Carriage of Dangerous Goods by Rail (RID), by Road (ADR), or on the Rhine (ADNR):

Not restricted. Shipping Name: Carbon Black.

International Air Transport Association (IATA): Not restricted. Listed as "carbon black, non-activated, mineral origin."

International Civil Air Organization-Technical Instructions (ICAO-TI): Not restricted. Listed as "carbon black, non-activated, mineral origin."

International Maritime Dangerous Goods Code (IMDG): Not restricted. Listed as "carbon black, non-activated, mineral origin."

United Nations Recommendations on the Transport of Dangerous Goods: Not restricted. Shipping Name: Carbon Black.

15. Regulatory Information

International Regulations

A: Regulatory Information

European Union

Label Information:

Carbon black is not defined as a dangerous substance or preparation according to Council Directive 67/548/EEC and its various amendments and adaptations.

Symbol:

None required.

Risk and Safety Phrases:

S22: Do not breathe dust.

S33: Take precautionary measures against static discharge (may not be applicable to all grades of carbon black).

Canada

Workplace Hazardous Material Information System (WHMIS):

Classification D2A Statement of Equivalence:

"This product has been classified in accordance with the hazard criteria of the Controlled Products

Regulations and MSDS contains all the information required by the Controlled Products Regulations."

Ingredients Disclosure List:

Contains carbon black.

United States

Carbon black is on the Chemical Hazard Information Profile (CHIP) list under TSCA.

Superfund Amendments and Reauthorization Act (SARA) Title III Section 313 Toxic Substances:

Does not contain any components subject to this section.

Toxic Release Inventory (TRI):

Under EPA's Toxics Release Inventory (TRI) program the reporting threshold for 21 Polycyclic Aromatic Compounds (PACs) has been lowered to 100 pounds per year manufactured, processed, or otherwise used. (64 CFR 58666, Oct. 29, 1999) The 100 pounds/yr applies to the cumulative total of 21 specific PACs. Carbon black may contain certain of these PACs and the user is advised to evaluate their own TRI reporting responsibilities. This product is not expected to contain detectable quantities of these substances, based on process testing of pyrolytic oil produced in the manufacturing operation (see section 16).

California Safe Drinking Water and Toxics Enforcement Act of 1986 (Proposition 65):

"Carbon black (airborne, unbound particles of respirable size)" is a California Proposition 65 listed substance.

B: Inventory Status

All components either are listed on or exempt from the following inventories: **Europe (EU):** EINECS (European Inventory of Existing Commercial Chemical Substances), EINECS-RN: 215-609-9. **Australia:** AICS (Australian Inventory of Chemical Substances). **Canada:** CEPA (Canadian Environmental Protection Act), domestic substance list (DSL). **China:** Inventory of Existing Chemical Substances. **Japan** MITI (Ministry of International Trade and Industry) List of Existing Chemicals Substances. 10-3074/5-3328 and 10-3073/5-5222 (Section-Structure No./Class Reference No.) **Korea:** TCC-ECL (Toxic Chemical Control Law Existing Chemical List) KE04882 **United States:** SARA (Super Fund Amendments and Reauthorization Act), 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 – MSDS requirements, carbon black is determined to be hazardous according to the following EPA hazard categories:

Immediate health hazard: No
Delayed (chronic) health hazard: Yes
Sudden release of pressure hazard: No
Reactive hazard: No

USA Right-to-Know - Federal

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Carbon Black (1333-86-4)

16. Other Information

Polycyclic Aromatic Hydrocarbon (PAH) Content 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. PAH in the pyrolytic manufacturing process used to create this product, are expected to partition into the volatile gas and liquid fractions and be separated from the solid product. PAH content as measured by EPA methods 8260 and 8270 was undetectable in the liquid fraction with the exception of naphthalene and 2-methylnaphthalene, which were present at a concentration of 0.03 mass percent. Based on these results we expect PAH content in our pyrolysis carbon black to be negligible.

References:

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- 2) UN: Globally harmonized system of classification and labelling of chemicals (GHS). Revision 3, 2009. http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html
- 3) EU: Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006. 2008:1-1355. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:353:0001:1355:EN:PDF>
- 4) Guidance to Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures. 14 May 2009- IHCP, DG Joint Research Centre, European Commission http://ecb.jrc.ec.europa.eu/documents/Classification-Labeling/CLP_Guidance_to_Regulation.pdf
- 5) Borm, P.J.A., Cakmak, G., Jermann, E., Weishaupt C., Kempers, P., van Schooten, F.J., Oberdorster, G., Schins, R.P. Formation of PAH-DNA adducts after in-vivo and vitro exposure of rats and lung cell to different commercial carbon blacks. *Tox Appl Pharm.* 2005. 1:205(2):157-167

- 6) Elder, A.C.P., Corson, N., Gelein, R., Mercer, P., Guyen, K., Cox, C., Keng, P., Finkelstein, J.N. and Oberdörster, G. (2000). Particle surface area-associated pulmonary effects following overloading with carbon black. *The Toxicologist*, Vol. 54, No 1, p. 315.
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- 9) Mauderly, J.L. (1996). Lung overload: The dilemma and opportunities for resolution. *Inhalation Toxicology* 8, 1-28
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- 11) Wellmann J, Weiland S, Neiteler G, Klein G, Straif K. Cancer mortality in German carbon black workers 1976-1998. *Occup Env. Med.*, August 2006; 63:513-521
- 12) Morfeld P, Buchte, SF, Straif K, Keil U, McCunney R, Piekarski C. Lung cancer mortality and carbon black exposure – Cox regression analysis of a cohort from a German carbon black production plant. *J Occup Env Med* 2006 (in press).
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MSDS Prepared by: Maryville Carbon Solutions, a Delaware Limited Liability Company
Verified by: Product Steward on 13 August 2015.

MSDS Information Phone Number: (660) 562-2030

The carbon black industry continues to sponsor research designed to identify adverse health effects from long term exposure to carbon black. This SDS is updated as new health and safety information becomes available.

The data and information presented herein corresponds to the present state of our knowledge and experience and is intended to describe our product with respect to possible occupational health and safety concerns. The user of this product has sole responsibility to determine the suitability of the product for any use and manner of use intended, and for determining the regulations applicable to such use in the relevant jurisdiction. This SDS is updated on a periodic basis in accordance with applicable health and safety standards.

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