SAFETY DATA SHEET (SDS)

(ISO 11014-1 / ANSI Z 400.1-1998 / 2001/58/EC)

Carbon Black

Revision Date: 6/1/2021
Supersedes: 6/29/2020

1. PRODUCT IDENTIFICATION

Product information: Global Harmonized System (GHS) Compliant

Product name (as used on product label): Carbon Black – Grades N-120, N-220, N-234, N-326, N-330, LH30, N-339, N-351, N-550, N-550-6, N-650, N-660, N-683, N-762, N-774, N774-6 IRB #8, Satin Blacks (SBX Grades)

REACH Regulation (EC) No. 1907/2006, Continental Carbon Registry No. A5736998-02
REACH Dossier Registration Reference No. 01-2119384822-32-0018, on 29/01/2010

☐ Manufacturer/Supplier: CONTINENTAL CARBON COMPANY
16850 PARK ROW
HOUSTON, TX, 77084
Tel: 1-281-647-3700
Fax: 1-281-647-3707

- EHS Phone number (Monday – Friday, 7:30 AM to 4 PM- CST):
Office 281-647-3807
Cellular 281-414-5476

☐ If calling from outside United States use country code (01)
Optional emergency number(s):

CHEMTEL: 1-800-255-3924 (US/Canada)
+1-813-248-0585 (Internationl)
1-300-954-583 (Australia)
0-800-591-6042 (Brazil)
800-099-0731(Mexico)
400-120-0751 (China)
000-800-100-4086 (India)

☐ Use of substance/preparation

Used as filler in rubber products, pigment in polymers and printing inks.
Not recommended as a human tattooing pigment.

2. HAZARDS INDENTIFICATION

Classification of the substance or mixture

A black, odorless, insoluble, powder that can burn or smolder at temperatures greater than 572ºF (>300ºC). 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.

WARNING: May form explosible dust-air mixture if dispersed.

- ☐ ***Keep away from all ignition sources including heat, sparks, and flame.***
- ☐ ***Prevent dust accumulations to minimize explosion hazard.***
- ☐ ***Control dust exposures to below applicable occupational exposure limits***.
- ☐ ***See Section 16 for further details on basis of explosible determination***.

EU: Not defined as a dangerous substance or preparation according to Council Directive 67/548/EEC and its various amendments and adaptations

WHMIS: This material is classified as D2A under Canadian Worker Hazardous Materials Information System (WHMIS) criteria.

OSHA: Classified as hazardous.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component(s)

Carbon Black, amorphous (100%)
Chemical formula: C
CAS number: 1333-86-4
European Inventory of Existing Chemical Substances (EINECS) number: 215-609-9
EU Classification: Not Classified

4. FIRST-AID MEASURES

First aid procedures

Inhalation:
Take affected persons out in fresh air. If necessary., restore normal breathing through standard first aid measures

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

Eye:
Rinse eyes thoroughly with large volumes of water keeping eyelid open. If symptoms

develop, seek medical attention.

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

Note to physicians: Treat symptomatically. First-aid responders should wear an approved respirator where airborne dust concentrations are expected to exceed occupational exposure limits.

5. FIRE-FIGHTING MEASURES

Extinguishing Media:

Use foam, carbon dioxide (CO2), dry chemical, or water fog. DO NOT USE high pressure water stream as this may spread burning powder (burning powder will float). Do not use high-pressure media which could cause the formation of potentially explosible dust-air mixture.

Flammable Properties:

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.

Carbon blacks containing more than 8% volatile materials 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 MSDS). See Section 9, Chemical and Physical Properties.

Specific hazards arising from the chemical:

Explosion: Avoid generating dust; fine dust dispersed in air in sufficient concentrations and in the presence of an ignition source is a potential dust explosion hazard.

May produce hazardous airborne concentrations of carbon monoxide if burning or smoldering

Carbon black can burn or smolder at temperatures greater than 400ºC (>752ºF) releasing hazardous products such as carbon monoxide (CO), carbon dioxide, and oxides of sulfur. At sufficient concentrations carbon monoxide, by itself, or when combined with carbon black can form an explosible hybrid mixture when dispersed in air.

May produce oxides of sulfur and carbon dioxide on combustion

Wet carbon black produces very slippery walking surfaces.

Protection of Firefighters:

Wear full protective fire fighting gear (Bunker gear) including self-contained breathing apparatus (SCBA). Special hazards arising from the chemical (e.g. nature of any

hazardous combustion products) include carbon monoxide (CO), carbon dioxide (CO2), and oxides of sulfur. NOTE: Wet carbon black produces slippery walking surfaces.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:

For non-emergency personnel:

a. Wear appropriate personal protective equipment and respiratory protection to avoid skin soiling and possible mechanical irritation to eyes and upper respiratory tract from airborne dust.
b. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosible mixture if they are released into the atmosphere in sufficient concentrations. Refer to NPFA 654 for good practices.
c. Remove ignition sources.
d. Avoid dispersal of dust in the air (e.g., refrain from clearing dust surfaces with compressed air).
e. Ensure adequate ventilation to control dust to below current occupational exposure limits.
f. Wet carbon black produces very slippery walking surfaces. See Section 8.

For emergency responders:

a. When airborne contaminants and concentrations cannot be immediately assessed self-contained breathing apparatus (SCBA) should be used.
b. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosible mixture if they are released into the atmosphere in sufficient concentrations. Refer to NPFA 654 for good practices.
c. Remove ignition sources.
d. Avoid dispersal of dust in the air (e.g., refrain from clearing dust surfaces with compressed air).
e. Non-sparking tools should be used.
f. Exposure to untreated carbon blacks does not require the use of special impervious clothing or gloves. Use of gloves, boots and other clothing to protect skin and work clothing from soiling is optional.

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.

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 (CAAA-90, 40 CFR 63).

Methods and materials for containment and cleaning up:

Small spills should be vacuumed when possible. Dry sweeping is not recommended except

with HEPA equipped machinery. A vacuum equipped with HEPA (high efficiency particulate air) filtration is recommended. If necessary, light water spray will reduce dust for dry sweeping but over-wetting may produce very slippery walking surfaces. Large spills may be shoveled into containers. See Section 13.

7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:

a. Minimize dust generation and accumulation on surfaces.
b. Avoid dust exposures above the occupational exposure limit.
c. Use local exhaust ventilation or other appropriate engineering controls to maintain dust below the occupational exposure limit.
d. Avoid contact with skin and eyes.
e. Dust may cause electrical shorts if able to penetrate electrical boxes and other electrical devices, possibly creating electrical hazards resulting in equipment failure. Electrical devices should be tightly sealed or purged with clean air, periodically inspected, and cleaned, as required.
f. If hot work (welding, torch cutting, etc.) is required the immediate work area must be cleared of carbon black product, dust and other combustible materials. Approved fire and heat resistant welding blankets may provide additional thermal protection from sparks and splatter. Follow standard safe practices for welding, cutting, and allied processes as described in ANSI Z49.1.
g. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Refer to NPFA 654 for good practices.
h. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.
i. Some grades of carbon black may be less electrically conductive, permitting a build-up of static energy during handling. Grounding of equipment and conveying systems may be required under certain conditions. (Contact your carbon black supplier if there is a question concerning the properties of your specific grade of carbon black.) Safe work practices include the elimination of potential ignition sources in proximity to carbon black dust; good housekeeping to avoid accumulations of dust on all surfaces; appropriate exhaust ventilation design and maintenance to control airborne dust levels to below the applicable occupational exposure limit; avoidance of dry sweeping or pressurized air for cleanup; avoidance of use of carbon black with incompatible materials (e.g., chlorates and nitrates), and appropriate employee hazard training.

CONDITIONS FOR SAFE STORAGE, INCLUDING INCOMPATIBILITIES:

a. Store carbon black in dry location away from ignition sources and strong oxidizers.
b. Carbon black is not classifiable as a Division 4.2 self-heating substance under the UN test criteria. However, current 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, e.g., silos.
c. Before entering vessels and confined spaces containing carbon black test for adequate oxygen, flammable gases and potential toxic air contaminants, e.g., CO.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limit Values:
Representative occupational exposure limits currently available for carbon black (CAS number: 001333-86-4). Country listing not all inclusive.

Country	Concentration, mg/m3
Argentina	3.5, TWA
Australia	3.0, TWA, inhalable
Belgium	3.6, TWA
Brasil	3.5, TWA
Canada (Ontario)	3.0 TWA, inhalable
China	4.0, TWA, 8.0, TWA, STEL (15 min)
Colombia	3.0, TWA, inhalable
Czech Republic	2.0, TWA
Egypt	3.5, TWA
Finland	3.5, TWA, 7.0, STEL
France – INRS	3.5, TWA/VME inhalable
Germany – AGW	1.5, TWA, respirable; 4.0, TWA, inhalable
Germany – TRGS 900	0.5 x GBP density in g/cm3, TWA, respirable; 10, TWA, inhalable
Germany – BeKGS527	0.2 x Nano-GBP density in g/cm3, TWA, respirable if no other information is available
Hong Kong	3.5, TWA
Indonesia	3.5, TWA/NABs
Ireland	3.5, TWA; 7.0, STEL
Italy	3.5, TWA, inhalable
Japan – MHLW	3.0
Japan – SOH	4.0, TWA; 1.0, TWA, respirable
Korea	3.5, TWA
Malaysia	3.5, TWA
Mexico	3.5, TWA
Russia	4.0, TWA
Spain	3.5, TWA (VLA-ED)
Sweden	3.0, TWA
United Kingdom	3.5, TWA, inhalable, 7.0, STEL, inhalable
EU REACH DNEL	2.0 (inhalable)
United States	3.5, TWA, OSHA-PEL 3.0, TWA, ACGIH-TLV®, inhalable 3.5, TWA, NIOSH-REL

ACGIH®	American Conference of Governmental Industrial Hygienists
mg/m3	milligrams per cubic meter
DNEL	Derived No-Effect Level
GBP	Granular biopersistent particles without known specific toxicity (carbon black is not listed in TRGS 900)
Nano-GBP	Dust of biopersistent nanomaterials without specific toxicological properties and without fibrous structures (carbon black is listed in BeKGS 527)
NIOSH	National Institute for Occupational Safety and Health
OES	occupational exposure standard
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
REL	recommended exposure limit
STEL	short-term exposure limit
TLV	threshold limit value
TRGS	Technische Regeln für Gefahrstoffe (Technical Rules for Hazardous Substances)
TWA	time weighted average, eight (8) hours unless otherwise specified

Engineering Controls:

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

b. Depending on processing requirements, equipment, and the composition, concentration, and energy requirements of intermediates and/or finished products, dust control systems may require explosion relief vents, or an explosion suppression system, or an oxygen-deficient environment. See NFPA 654 and 68.

c. Local exhaust ventilation recommended for all transfer points to mixers, blenders, batch feeding processes and point sources that may release dust to work environment.

d. Recommend mechanical handling to minimize human contact with dust.

e. Recommend ongoing preventive maintenance and housekeeping programs to minimize dust release from ventilation control systems and the build-up of dust on surfaces in work environments. See NFPA 654.

f. Except for approved power-operated trucks designated as EX, power-operated industrial trucks shall not be used in atmospheres containing hazardous concentrations of carbon black dust.

Personal Protective Equipment:

Consistent with good occupational hygiene [and safe] practices, personal protective equipment (PPE) should be used in conjunction with other control measures, including engineering controls, ventilation and isolation."

PPE recommended:

a. Eye/face protection: Safety glasses or goggles are recommended as a matter of good practice.

b. Skin protection: Wear general protective clothing to minimize skin exposure and soiling. Work clothes should not be taken home and should be washed daily.

   No special glove composition is required for carbon black. General duty gloves may be used to protect hands from carbon black soiling. Use of a barrier cream may help prevent skin drying and minimize soiling. Wash hands and other exposed skin with mild soap and water.

c. Respiratory protection: Approved air purifying respirator (APR) should be used where airborne dust concentrations are expected to exceed occupational exposure limits. Use a positive-pressure, air supplied respirator if there is any potential for uncontrolled release, exposure levels are not known, or in circumstances where APRs may not provide adequate protection.

   When respiratory protection is required to minimize exposures to carbon black, programs should follow the requirements of the appropriate governing body for the country, province or state. Selected references to respiratory protection standards are provided below:

   - OSHA 29CFR1910.134, Respiratory Protection
   - CR592 Guidelines for Selection and Use of Respiratory Protective Devices (CEN)
   - German/European Standard DIN/EN 143, Respiratory Protective Devices for Dusty Materials (CEN)

General Hygiene Considerations

Wash hands and face thoroughly with mild soap and water before eating and drinking.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	powder or pellet
Color	black
Odor	odorless
Odor threshold:	not applicable
Melting point/range	>3000 ºC
Boiling point/range	>3000 ºC

Vapor pressure	not applicable
Vapor Density	not applicable
Flash Point	not applicable
Flammability	not flammable[1]
Evaporation rate	not applicable
Density: (20ºC)	1.7 – 1.9 g/cm^3
Bulk density:	1.25-40 lb/ft^3, 20-640 kg/m^3
Pellets	200-680 kg/m^3
Powder (fluffy)	20-380 kg/m^3
Solubility (in Water):	insoluble
pH value: (ASTM 1512)	4-11 [50 g/l water, 68ºF (20ºC)]
Partition coefficient (n-octanol/water):	not applicable
Viscosity:	not applicable
Decomposition temperature:	not applicable
Auto-ignition temperature	>140ºC (>284ºF)[2]

[1]Not a flammable solid, per test method N.1 as described in Part III, sub-section 33.2.1 of the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (See Section 16 of SDS).

[2]Not classifiable as a Division 4.2 self-heating substance as defined by UN Recommendations on the Transport of Dangerous Goods and the International Maritime Dangerous Goods Code. (Based on 100mm sample cube).

Explosible dust

"Different dusts of the same chemical material can have different ignitability and explosibility characteristics, depending upon physical characteristics such as particle size, shape, and moisture content. These physical characteristics can change during manufacturing, use, or while the material is being processed." (OSHA 3371-08 2009.)

Dust explosion class: These data do not apply to CB containing GREATER than 8% total volatiles. See Table 1. (Attention ICBA producers: the following data only represents ASTM rubber grade blacks further testing maybe required for specialty grades.

Table 1. Explosible Properties

Metric	Furnace Black	Thermal Black	Method
Kst (bar-m/sec)	30-100	9	ASTM 1226-10 or VDI 2263-1 (1990) or DIN 14034 using a 2 – 5 kJ igniter in a 1m^3 vessel.
Pmax (bar)	10	5.7	ASTM 1226-10 or VDI 2263-1 (1990) or DIN 14034 using a 2 -

			5 kJ igniters in a $1m^3$ vessel.
MEC g/m^3	50	625	ASTM E1515 Minimum Explosive Concentration (MEC)
Hazard Class	ST-1	ST-1	Dust explosion class (OSHA)
MAIT (°C)	>400	>450	ASTM E2021-09 Minimum auto-ignition temperature of a dust layer (MAIT)
MIT (°C)	>600	>600	ASTM 1491-97 Minimum ignition temperature of a dust cloud (MIT) (BAM Oven)
MIE (kJ)	>1	>1	ASTM E2019-03 Minimum Ignition Energy (MIE)

10. STABILITY AND REACTIVITY

Reactivity: Stable under normal ambient conditions.

Chemical stability

Stable under normal storage conditions.
Prevent exposure to high temperatures and open flames
Stable under normal ambient conditions. Prevent exposure to high temperatures and open flames.

Possibility of hazardous reactions

Hazardous polymerization will not occur under normal conditions.

Conditions to avoid

Avoid high temperatures >400°C (>752°C) and sources of ignition.

Take precautionary measures against static discharges. Avoid dust formation. Grounding of equipment and conveying systems may be required under certain conditions.

Incompatibility materials

Avoid strong oxidizers such as chlorates, bromates, and nitrates.

Hazardous decomposition products

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

11. TOXICOLOGICAL INFORMATION

Acute toxicity:

Acute oral toxicity: LD_{50} (rat) > 8000 mg/kg. (Equivalent to OECD TG 401)

Acute inhalation toxicity: not determined.
Acute dermal toxicity: not determined.

Assessment: Non-toxic after ingestion.

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/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.

Sensitization:

Guinea pig skin (Buehler Test): Not sensitizing (OECD TG 406)

Assessment: Not sensitizing in animals.
No cases of sensitization in humans have been reported.

Germ cell mutagenicity:

In vitro:

Carbon black is not suitable to be tested directly 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 they are very tightly bound to carbon black and are not bioavailable (Borm, 2005).

In vivo:

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 (Driscoll, 1997). This observation is considered to be rat-specific and a consequence of "lung overload," which leads 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 "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 and developmental toxicity

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

Specific target organ toxicity – single exposure (STOT-SE)

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

Specific target organ toxicity – repeated exposure (STOT-RE)

Animal toxicity

Repeated dose toxicity: inhalation (rat), 90 days, No Observed Adverse Effect Concentration (NOAEC) = 1.1 mg/m^3 (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 FEV_1 from a 1 mg/m^3 [8] hour TWA daily (inhalable fraction) exposure over a 40-year period (Harber, 2003). An earlier European investigation suggested that exposure to 1 mg/m^3 (inhalable fraction) of carbon black over a 40-year working lifetime would result in a 48 ml decline in FEV_1 (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.

Assessment: Inhalation - 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 "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: Based on available data, specific target organ toxicity is not expected after repeated oral exposure.

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

Aspiration hazard

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

12. ECOLOGICAL DATA

a) "Toxicity"

Aquatic toxicity:

Acute fish toxicity:
LC50 (96 h) > 1000mg/l,
Species: Brachydanio rerio (zebrafish),
Method: OECD Guideline 203

Acute invertebrate toxicity:
EC50 (24 h) > 5600 mg/l.
Species: Daphnia magna (waterflea),
Method: OECD Guideline 202

Acute algae toxicity:
EC50 (72 h) >10,000 mg/l
NOEC >10,000 mg/l
Species: Scenedesmus subspicatus,
Method: OECD Guideline 201

Activated sludge:
EC0 (3 h) >= 400 mg/l.
EC10 (3h): ca. 800 mg/l

Method: DEV L3 (TTC test)

b) "Persistence and degradability;" (Environmental fate)

Not soluble in water. Expected to remain on soil surface. Not expected to degrade.

c) "Bioaccumulative potential"

Bioaccumulation is not expected due to physico-chemical properties of the substance.

d) "Mobility in soil"

Not soluble in water. Not expected to migrate.

e) "Other adverse effects."

No other data are available.

13. DISPOSAL CONSIDERATIONS

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.

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.

U.N.: United Nations (no U.N. Number)

Container/Packaging. Return reusable containers to manufacturer. Paper bags may be incinerated, or recycled, or disposed of in an appropriate landfill in accordance with national and local laws.

14. TRANSPORT INFORMATION: [designated Non-mandatory under OSHA]

UN Number: No UN number. [Carbon black is not classified as a hazardous material by the UN.]

UN Proper shipping name: Not applicable

Transport hazard class(es): Not applicable

Packing group, if applicable: Not applicable

Environmental hazards

Marine hazard: not applicable

Special precautions for user

None

Additional information:

US-DOT transport information: not regulated.

International transport identification:

"Carbon black, non-activated, mineral origin." Carbon black is not a Division 4.2 hazard.

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.

Carbon black is not restricted for transport by the following regulations:

- ☐ UN Model Regulations on the Transport of Dangerous Goods
- ☐ European Agreement concerning the International Carriage of Dangerous Goods by Road, as amended (ADR)
- ☐ European Agreement concerning the International Carriage of Dangerous Goods by Rail, as amended (RID)
- ☐ European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways, as amended (ADN)
- International Convention for the Safety of Life at Sea – International Maritime Dangerous Goods Code (IMDG)
- Convention on International Civil Aviation – Annex 18 – Safe Transport of Dangerous Goods by Air
- ☐ International Air Transport Association (IATA-DGR)
- ☐ MARPOL 73/78, Annex II
- ☐ International Bulk Chemical Code (IBC)
- ☐ United States Department of Transportation
- ☐ Canadian Transport of Dangerous Goods Regulation
- ☐ Australian Dangerous Goods Code

15. REGULATORY INFORMATION [designated Non-mandatory under OSHA]

European Union – Label Information:

Carbon black is not defined as a dangerous substance or preparation according to Regulation

(EC) No. 1272/2008 (CLP) or Council Directive 67/548/EEC and its various amendments and adaptations.

Symbol – none required.

Germany – water classification

WGK Number (Kenn-Nr): 1742
WGK Class (Wassergefährdungsklasse): nwg (non-hazardous to waters)

Canada

Worker Hazardous Material Information System (WHMIS), Classification Combustible Dust

Statement of Equivalence

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

Ingredients Disclosure List

Contains carbon black. See Section 2.

United States

Superfund Amendments and Reauthorization Act (SARA) Title III

Section 313 Toxic Substances: Does contain any components subject to this section.

Sections 311/312 apply if carbon black is present at any one time in amounts equal to or greater than 10,000 pounds, and 10-lbs for Benzo (g,h,i) perylene which is listed separately and has a 10 lb. reporting threshold. Under Section 311/312 – SDS 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

OSHA, Hazard Communication Standard, 29 CFR 1910.1200

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 Fed. Reg. 58666 (Oct. 29, 1999).) The 100 pounds/yr applies to the cumulative total of 21 specific PACs. Section 1.5.1 indicates that the de minimis exemption (i.e., disregarding amounts less than 0.1%) has been eliminated for PACs. Carbon black may contain certain of these PACs and the user is advised to evaluate their own TRI reporting responsibilities. (Note: Benzo

(g,h,i) perylene is listed separately and has a 10 lb. reporting threshold.)

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

Korea:

Industrial Safety and Health Law, a hazardous factor for which the exposure limit has been established (TWA 3.5 mg/ m^3). Dangerous Substance Safety Management Law, not applicable.

Waste Management Law.

Dispose of contents/containers in accordance with regulations prescribed in the Waste Management Law. This substance is not classified as a designated waste.

Carbon black, CAS number 1333-86-4, appears on the following inventories:

Australia: Australian Inventory of Chemical Substances (AICS).

Canada: Domestic Substance List (DSL);

China: Inventory of Existing Chemical Substances in China (IECSC).

European Union: European Inventory of Existing Commercial Chemical Substances (EINECS), 215-609-9.

European Union: REACH Regulation (EC) No. 1907/2006: Company specific registration is required; contact your supplier for additional information.

Germany: VDI guideline 2580, Emission Control Production Plants for Carbon Black - Classification of Carbon Black in Water: Water Endangering Class (WGK) is not water endangering, ID number 1742.

Japan: Existing and New Chemical Substances (ENCS), Industrial Safety and Health Law Inventory (ISHL)

Korea: Toxic Chemical Control Law (TCCL), Korean Existing Chemicals Inventory (KECI)

Philippines: Philippine Inventory of Chemicals and Chemical Substances (PICCS).

Taiwan: Chemical Substance Nomination and Notification (CSNN)

United States: Toxic Substances Control Act (TSCA) Inventory

16. OTHER INFORMATION

Revision Date: 6/1/2021
Supersedes: 6/29/2020

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.

Questions concerning PAH content of carbon black and analytical procedures should be addressed to your carbon black supplier.

National Fire Protection Association (NFPA) Rating:

Health: 0
Flammability: 1
Reactivity: 0
0 = minimal, 1 = slight, 2 = moderate, 3 = serious, 4 = severe

Hazardous Materials Identification System® (HMIS®) Rating:

Health: 1* (*designates chronic hazard)
Flammability: 1
Physical Hazard: 0
0 = minimal, 1 = slight, 2 = moderate, 3 = serious, 4 = severe

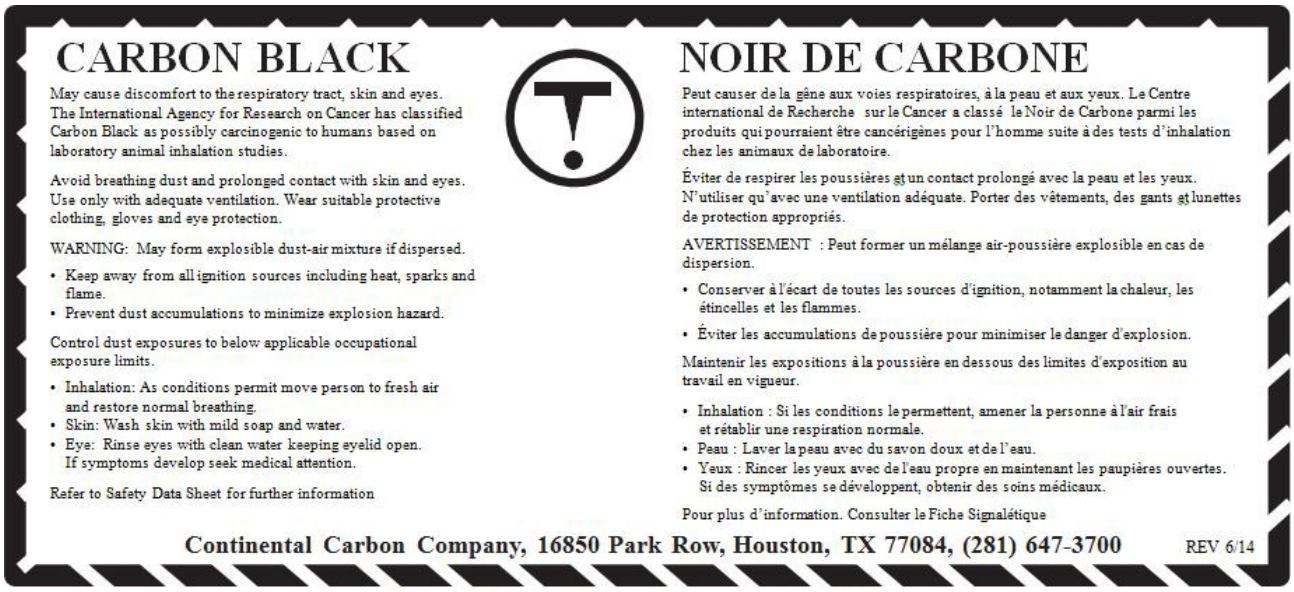
HMIS® is a registered trademark of the National Paint and Coatings Association

The Hazard Ranking of Carbon Black for Flammability 1 is supported by the science and data that has not changed in the last 40 years. Carbon Black is a low St 1 Weak to Moderate Explosible dust. The NFPA 704 document Table 6.2 uses Carbon Black as an example of low volatile finely divided material i.e. *"Finely divided solids less than 420 ìm (40 mesh) that are non-explosible in air at ambient conditions, such as low volatile carbon black and polyvinylchloride (PVC)"*
According to VDI 2263, part 1, the smolder temperature of a 5 mm dust layer of (standard) carbon blacks is > 400 °C. This testing method is comparable to ASTM E 2021 "Standard Test Method for Hot-Surface Ignition Temperature of Dust Layers". Thus NFPA 704 hazard degree 1 for flammability saying "materials in this degree require considerable preheating, under all ambient conditions, before ignition and combustion can occur" is appropriate. Carbon Black requires preheating before ignition can occur, and to be classified as criteria 2 NFPA outlines: "Finely divided solids less than 420 ìm (40 mesh) that present an ordinary risk of forming an ignitable dust cloud". Industry experience demonstrates Carbon Black does not present ordinary risk of forming an ignitable dust cloud.

Although not "nonexplosible in air" (standard) carbon black does not "present an ordinary risk of forming an ignitable dust cloud" (as mentioned as a criteria for flammability hazard degree 2), because the necessary ignition energy (> 1 kJ) is 1000 - 1000000 times higher than the ignition energies of explosible dusts (with ordinary or elevated risk).

Label Information:

WHMIS Label:



CARBON BLACK

May cause discomfort to the respiratory tract, skin and eyes. The International Agency for Research on Cancer has classified Carbon Black as possibly carcinogenic to humans based on laboratory animal inhalation studies.

Avoid breathing dust and prolonged contact with skin and eyes. Use only with adequate ventilation. Wear suitable protective clothing, gloves and eye protection.

WARNING: May form explosible dust-air mixture if dispersed.

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

Control dust exposures to below applicable occupational exposure limits.

- Inhalation: As conditions permit move person to fresh air and restore normal breathing.
- Skin: Wash skin with mild soap and water.
- Eye: Rinse eyes with clean water keeping eyelid open. If symptoms develop seek medical attention.

Refer to Safety Data Sheet for further information

NOIR DE CARBONE

Peut causer de la gêne aux voies respiratoires, à la peau et aux yeux. Le Centre international de Recherche sur le Cancer a classé le Noir de Carbone parmi les produits qui pourraient être cancérigènes pour l'homme suite à des tests d'inhalation chez les animaux de laboratoire.

Éviter de respirer les poussières et un contact prolongé avec la peau et les yeux. N'utiliser qu'avec une ventilation adéquate. Porter des vêtements, des gants et lunettes de protection appropriés.

AVERTISSEMENT : Peut former un mélange air-poussière explosible en cas de dispersion.

- Conserver à l'écart de toutes les sources d'ignition, notamment la chaleur, les étincelles et les flammes.
- Éviter les accumulations de poussière pour minimiser le danger d'explosion.

Maintenir les expositions à la poussière en dessous des limites d'exposition au travail en vigueur.

- Inhalation : Si les conditions le permettent, amener la personne à l'air frais et rétablir une respiration normale.
- Peau : Laver la peau avec du savon doux et de l'eau.
- Yeux : Rincer les yeux avec de l'eau propre en maintenant les paupières ouvertes. Si des symptômes se développent, obtenir des soins médicaux.

Pour plus d'information. Consulter le Fiche Signalétique

Continental Carbon Company, 16850 Park Row, Houston, TX 77084, (281) 647-3700 REV 6/14

CAS# 1333-86-4 Store in cool dry place away from heat ignition sources.
HMIS rating: Health = 1*, Flammability =1, Physical =

General:

The carbon black industry (International Carbon Black Association, www.carbon-black.org) continues to sponsor research designed to identify adverse health effects from long term exposure to carbon black. This SDS will be updated, as new EHS information may become available.

Prepared by: Brad Stevener _____

Title: Senior Manager – Environment, Health and Safety

Email bstevener@continentalcarbon.com

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind, express or implied, and we assume no responsibility for any loss, damage, or expense, direct or consequential, arising out of their use.