SAFETY DATA SHEET
According to Regulation (EC) No 1907/2006 (REACH)

CARBON BLACK

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product Identifier

1.1.1 Chemical name: Carbon Black

1.1.2 CAS Number: 1333-86-4

1.1.3 REACH Registration No.: 01-2119384822-32-XXXX

1.1.4 EINECS-RN: 215-609-9

1.1.5 This SDS is valid for the following grades:

Trade Name:
CD, Furnex®, Neotex®, Statex®, XT Powder or Beads including H, HB, D, Gold or Ultra® versions of these grades

<table>
<thead>
<tr>
<th>ASTM</th>
<th>Furnex®</th>
<th>CD</th>
<th>XT</th>
</tr>
</thead>
<tbody>
<tr>
<td>N115</td>
<td>N299</td>
<td>N351</td>
<td>N660</td>
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<td>N121</td>
<td>N326</td>
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<td>N683</td>
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<td>N134</td>
<td>N330</td>
<td>N539</td>
<td>N762</td>
</tr>
<tr>
<td>N220</td>
<td>N339</td>
<td>N550</td>
<td>N765</td>
</tr>
<tr>
<td>N231</td>
<td>N343</td>
<td>N630</td>
<td>N772</td>
</tr>
<tr>
<td>N234</td>
<td>N347</td>
<td>N650</td>
<td>N774</td>
</tr>
</tbody>
</table>

1.2 Relevant identified uses of the substance or mixture and uses advised against

1.2.1 Relevant identified uses: Additive for plastic and rubber; pigment; chemical reagent, additive for batteries, refractories, various.

1.2.2 Uses advised against: Pigments in tattoo colors for humans

1.2.3 Reasons why uses advised against: Not a registered use

1.3 Details of the supplier of the safety data sheet

1.3.1 Manufacturer: Columbian Chemicals Company
1800 West Oak Commons Court
Marietta, Georgia 30062, USA

1.3.2 Telephone Number: +1 (800) 235-4003 or +1 (770) 792-9400

1.3.3 Email Address: megan.morgan@adityabirla.com
1.3.4 Emergency Telephone Numbers:
Birla Carbon Brazil: +55-13-3362-7100 (Cubatão, São Paulo)
Birla Carbon Brazil: +55-71-3616-1100 (Camaçari, Bahia)
Birla Carbon Canada: +1-905-544-3343
Birla Carbon China: +86-536-532-8742
Birla Carbon Germany: +49-511-959-350
Birla Carbon Hungary: +36-49-544-000
Birla Carbon Italy: +39-0321-798-211
Birla Carbon Spain: +34-942-503-030
Birla Carbon USA: +1-620-356-3151, ext. 25 (Kansas)
Birla Carbon USA: +1-337-836-5641, ext. 260 (Louisiana)
Canada: +1 (613) 996-6666 CANUTEC
Hungary: +36-80-201-199 or +36-14-766-464 (Health Toxicological Information Service of the National Institute of Chemical Safety)
Spain: +34-915-620-420 (National Institute of Toxicology)
USA: +1 (800) 424-9300 CHEMTREC

SECTION 2: Hazard(s) Identification

2.1 Classification of the substance or mixture
2.1.1 European Union: Not a hazardous substance or preparation according to Regulation n°1272/2008 on Classification, Labeling, and Packaging (CLP).
2.1.2 European Union: Not a hazardous substance according to Directive 67/548/EEC
2.1.3 United States: Not a hazardous substance or preparation according to the Globally Harmonized System (GHS) as adopted by OSHA and in accordance with 29 CFR 1910.1200.
2.1.4 Canada: Classified as D2A under the Canadian Worker Hazardous Materials Information System (WHMIS) criteria.
2.1.5 Other: Not a hazardous substance or preparation according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

2.2 Label elements
2.2.1 European Union: Not applicable
2.2.2 United States: Not Applicable
2.2.3 Canada:

2.3 Other hazards
2.3.1 Black, odorless, insoluble powder that can burn or smolder at temperatures greater than 572 °F (>300 °C).

2.3.2 Hazardous products of decomposition can include carbon monoxide, carbon dioxide, and oxides of sulfur.

2.3.3 May cause reversible mechanical irritation to the eyes and respiratory tract, especially at concentrations above the occupational exposure limit.

2.3.4 Some grades are sufficiently electrically non-conductive to allow a build-up of static charge during handling.

2.3.5 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 carbons blacks. Recent research has shown that the PAH content of carbon blacks is not released in biological fluids and thus, is not available for biological activity.

SECTION 3: Composition/information on ingredients

3.1 Substance
3.1.1 Carbon Black (amorphous) 100%

3.1.2 CAS Number: 1333-86-4

3.1.3 EINECS-RN: 215-609-9

SECTION 4: First-aid measures

4.1 Description of first-aid measures
4.1.1 Inhalation: Take affected persons into fresh air. If necessary, restore normal breathing through standard first aid measures.

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

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

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

4.2 Most important symptoms, both acute and delayed
4.2.1 Irritating to the eyes and respiratory tract if exposed above the occupational exposure limits.

4.3 Indication of any immediate medical attention and special treatment needed
4.3.1 Treat symptomatically

SECTION 5: Fire-fighting measures

5.1 Extinguishing media
5.1.1 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 hazards arising from the substance or mixture
5.2.1 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 closely observed 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 Advice for fire fighters
5.3.1 Wear full protective firefighting gear, including self-contained breathing apparatus (SCBA). Wet carbon black produces very slippery walking surfaces.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
6.1.1 Wear appropriate personal protective equipment and respiratory protection. See Section 8.

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

6.3.2 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).

6.4 Reference to other sections
6.4.1 See section 8. See section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
7.1.1 Avoid dust exposures above the occupational exposure limits. Use engineering controls to limit exposures to below the occupational exposure limits. Wash exposed skin daily. 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 Conditions for safe storage, including any incompatibilities
7.2.1 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.

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

7.3 Specific end use(s)
7.3.1 Not available
SECTION 8: Exposure controls/personal protection

8.1 Control parameters

8.1.1 Exposure limit values

<table>
<thead>
<tr>
<th>Country</th>
<th>Exposure Limit Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL/DMEL values</td>
<td>2.0 mg/m³ TWA, inhalable; 0.5 mg/m³ respirable</td>
</tr>
<tr>
<td>Argentina</td>
<td>3.5 mg/m³ TWA</td>
</tr>
<tr>
<td>Australia</td>
<td>3.0 mg/m³ TWA, inhalable</td>
</tr>
<tr>
<td>Belgium</td>
<td>3.6 mg/m³ TWA</td>
</tr>
<tr>
<td>Brazil</td>
<td>3.5 mg/m³ TWA, inhalable</td>
</tr>
<tr>
<td>Canada</td>
<td>3.0 mg/m³ TWA, inhalable</td>
</tr>
<tr>
<td>China</td>
<td>4.0 mg/m³ TWA, inhalable</td>
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<tr>
<td>Colombia</td>
<td>3.0 mg/m³ TWA, inhalable</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>2.0 mg/m³ TWA, inhalable</td>
</tr>
<tr>
<td>Finland</td>
<td>3.5 mg/m³ TWA</td>
</tr>
<tr>
<td>France INRS</td>
<td>3.5 mg/m³ TWA/VME, inhalable</td>
</tr>
<tr>
<td>Germany (AGW)</td>
<td>4.0 mg/m³ TWA, inhalable; 1.5 mg/m³ respirable</td>
</tr>
<tr>
<td>Germany (TRGS)</td>
<td>10.0 mg/m³ TWA inhalable; 3.0 mg/m³, TWA, respirable</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>3.5 mg/m³ TWA</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3.5 mg/m³ TWA/NABs</td>
</tr>
<tr>
<td>Italy</td>
<td>3.5 mg/m³ TWA, inhalable</td>
</tr>
<tr>
<td>Japan (SOH)</td>
<td>4.0 mg/m³ TWA, inhalable; 1.0 mg/m³ respirable</td>
</tr>
<tr>
<td>Japan (MHLW)</td>
<td>3.0 mg/m³ TWA</td>
</tr>
<tr>
<td>Korea</td>
<td>3.5 mg/m³ TWA</td>
</tr>
<tr>
<td>Malaysia</td>
<td>3.5 mg/m³ TWA</td>
</tr>
<tr>
<td>Mexico</td>
<td>3.5 mg/m³ TWA</td>
</tr>
<tr>
<td>Netherlands (MAC)</td>
<td>3.5 mg/m³ TWA, inhalable</td>
</tr>
<tr>
<td>Norway</td>
<td>3.5 mg/m³ TWA</td>
</tr>
<tr>
<td>Poland</td>
<td>4.0 mg/m³ TWA</td>
</tr>
<tr>
<td>Spain</td>
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<td>Sweden</td>
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</tr>
<tr>
<td>United Kingdom WEL</td>
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</tr>
<tr>
<td>US ACGIH - TLV</td>
<td>3.0 mg/m³ TWA, inhalable</td>
</tr>
<tr>
<td>US OSHA - PEL</td>
<td>3.5 mg/m³ TWA, inhalable</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

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

8.2.2 Personal Protective Equipment (PPE)

8.2.2.1 Respiratory: Approved particulate respirators should be used where airborne concentrations are expected to exceed occupational exposure limits.

8.2.2.2 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.

8.2.2.3 Eye protection: Wear safety glasses or goggles.

8.2.2.4 Skin protection: Wear general protective clothing to minimize skin contact. Work clothes should not be taken home and should be washed daily.
8.2.2.5 General hygiene considerations: Emergency eyewash and safety showers should be in close proximity. Wash hands and face thoroughly with mild soap before eating or drinking.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>powder or pellet</td>
</tr>
<tr>
<td>Color</td>
<td>black</td>
</tr>
<tr>
<td>Odor</td>
<td>odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>not applicable</td>
</tr>
<tr>
<td>Molecular formula</td>
<td>C</td>
</tr>
<tr>
<td>Molecular weight (as carbon)</td>
<td>12</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>not applicable</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>not applicable</td>
</tr>
<tr>
<td>Freezing point/range</td>
<td>not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>not applicable</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>not applicable</td>
</tr>
<tr>
<td>Density (20°C)</td>
<td>1.7 – 1.9 g/cm³</td>
</tr>
<tr>
<td>Bulk density</td>
<td>1.25 – 40 lb/ft³, 20 – 680 kg/m³</td>
</tr>
<tr>
<td></td>
<td>200 – 680 kg/m³ (Pellets)</td>
</tr>
<tr>
<td></td>
<td>20 – 380 kg/m³ (Powder)</td>
</tr>
<tr>
<td>Solubility</td>
<td>insoluble in water</td>
</tr>
<tr>
<td>pH value</td>
<td>5 - 10 [50 g/L water, 20 °C (68 °F)] – non-post-treated carbon black</td>
</tr>
<tr>
<td></td>
<td>2 - 7 [50 g/L water, 20 °C (68 °F)] – non-post-treated carbon black</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>not applicable</td>
</tr>
<tr>
<td>Viscosity</td>
<td>not applicable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>300 °C (572 °F)</td>
</tr>
</tbody>
</table>

Flammable and explosive properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td>Flashpoint</td>
<td>not applicable</td>
</tr>
<tr>
<td>Flammability classification</td>
<td>not applicable</td>
</tr>
<tr>
<td>Explosive limits (furnace black dust):</td>
<td></td>
</tr>
<tr>
<td>Lower:</td>
<td>not determined</td>
</tr>
<tr>
<td>Upper:</td>
<td></td>
</tr>
<tr>
<td>Dust explosion class</td>
<td>ST 1 (VDI 2263, EC 84/449)</td>
</tr>
<tr>
<td>Maximum absolute explosion pressure</td>
<td>10 bar</td>
</tr>
<tr>
<td>Maximum rate of pressure rise</td>
<td>30-100 bar/s</td>
</tr>
<tr>
<td>Spontaneous ignition (auto ignition):</td>
<td>&gt;140 °C (&gt;284 °F)</td>
</tr>
<tr>
<td>Maximum ignition temperature:</td>
<td></td>
</tr>
<tr>
<td>BAM furnace:</td>
<td>&gt;500 °C (&gt;932 °F) (VDI 2263)</td>
</tr>
<tr>
<td>Godbert-Greenwal Furnace:</td>
<td>&gt;315 °C (&gt;600 °F) (VDI 2263)</td>
</tr>
<tr>
<td>Minimum ignition energy:</td>
<td>&gt;10 J</td>
</tr>
<tr>
<td>Burn rate:</td>
<td>&gt;45 s (VDI 2263, EC 84/449) (not classifiable as “highly flammable” or “easily ignitable”)</td>
</tr>
<tr>
<td>Ignition energy (furnace black):</td>
<td>&gt;1 kJ (VDI 2263)</td>
</tr>
</tbody>
</table>

9.2 Other information

Not available

SECTION 10: Stability and reactivity

10.1 Reactivity

10.1.1 May react exothermically upon contact with strong oxidizers.
10.2 Chemical stability
10.2.1 Stable under normal ambient conditions; decomposition: >300 °C (> 572 °F).

10.3 Possibility of hazardous reactions
10.3.1 Hazardous polymerization will not occur. Not sensitive to mechanical impact.

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

10.5 Incompatible materials
10.5.1 Strong oxidizers such as chlorates, bromates, and nitrates.

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

10.7 Static discharge effects
10.7.1 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 vapors can be present, ensure that all equipment is electrically earthed/grounded before beginning transfer operations.

SECTION 11: Toxicological information

11.1 Information on toxicological effects
11.1.1 Acute Toxicity
Acute oral toxicity: LD50 (rat), >8000 mg/kg
Primary irritation:
  Skin (rabbit): non-irritative, index score 0.6/8 (4 = 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.

11.1.2 Subchronic toxicity
Rat, inhalation, 90-days: inflammation, hyperplasia, fibrosis
  Target organ: lungs
NOEL = 1 mg/m³

11.1.3 Chronic toxicity
Rat, oral, 2 years: no tumors
Mouse, oral, 2 years: no tumors
Mouse, dermal, 2 years: no skin tumors
Rat, inhalation, 2 years: inflammation, fibrosis, tumors
  Target organ: lungs
Mouse/hamster, inhalation, 2 years: no tumors
  Target organ: lungs

Note: Effects in the rat lung are considered to be related to the “lung overload phenomenon”¹ ¹⁶-⁹ 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.
11.1.4 Carcinogenicity classification

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

11.1.4.2 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)*.

11.1.4.3 NTP: Carbon black is not designated as a carcinogen by the U.S. National Toxicology Program (NTP).

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

11.1.4.5 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/m$^3$ for PAHs in air, measured as the cyclohexane-extractable fraction.

11.1.5 Specific Target Organ Toxicity (STOT) classification

Inhalation studies with the rat showed lung effects (see Section 11.1.2 and 11.1.3). These effects are believed to be the effects of “lung overload” 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. Also, the CLP Guidance on classification and labeling states that the “lung overload” mechanism is not relevant to humans. Therefore, no STOT, Repeated Exposure classification is made.

11.1.6 Sensitization

No animal data is available. No cases in humans have been reported.

11.1.7 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 insolvability 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.

11.1.8 Reproductive and teratogenic effects

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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 fetus under in vivo conditions. Therefore, no adverse effects of carbon black to fertility/reproduction or to fetal development are expected. No effects have been reported in long-term animal studies.

11.1.9 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 UK \(^\text{10}\) 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 \(^\text{11-14}\) found a similar increase in lung cancer risk but, like the 2001 UK study \(^\text{10}\), found no association with carbon black exposure. In contrast, a large US study \(^\text{15}\) 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 \textit{inadequate} \(^\text{1}\).

Since this IARC evaluation of carbon black, Sorahan and Harrington \(^\text{16}\) 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 \(^\text{17-18}\) 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 Harrington \(^\text{16}\). Morfeld and McCunney \(^\text{19}\) 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.

SECTION 12: Ecological information

12.1 Toxicity
12.1.1 Aquatic toxicity
12.1.1 Acute algae toxicity: EC 50 (72 h) > 10,000 mg/L, *Scenedesmus subspicatus* (OECD Guideline 201)
NOEC 50 > 10,000 mg/L, *Scenedesmus subspicatus* (OECD Guideline 201)

12.1.1.2 Acute fish toxicity: LC50 (96 h) > 1000 mg/L, *Brachydanio rerio* (zebrafish) (OECD Guideline 201)

12.1.1.3 Acute water flea toxicity: EC50 (24 h) > 5600 mg/L, *Daphnia magna* (waterflea) (OECD Guideline 201)

12.2 Persistence and degradability
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.

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

12.4 Mobility in soil
Not available

12.5 Results of PBT and vPvB assessment
Carbon black is not a PBT or a vPvB.

12.6 Other adverse effects
12.6.1 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.

12.6.2 Behavior in water treatment plants
Activated sludge, EC0 (3 h) > 800 mg/L. DEV L3 (TTC test)

**SECTION 13: Disposal considerations**

13.1 Waste treatment methods
13.1.1 Product disposal
Product should be disposed of in accordance with the regulations issued by the appropriate federal, provincial, state, and local authorities.

Brazil: Considered as a Class IIA waste – not inert.
Canada: Not a hazardous waste under provincial regulations
USA: Not a hazardous waste under U.S. RCRA, 40 CFR 261.

13.1.2 Container/Packaging disposal
Empty packaging must be disposed of in accordance with national and local laws.

**SECTION 14: Transport information**

14.1 UN Number
Carbon blacks covered by this Safety Data Sheet are **not restricted** for transport and are **not considered to be** “dangerous goods” by the following regulations:

- Brazilian Ministry of Transport – GEIPOT
- Canadian Transport of Dangerous Goods (TDG)
- European Carriage of Dangerous Goods by Rail (RID), by Road (ADR), or on the Rhine (ADNR)
- International Air Transport Association (IATA)
  - Note: listed as “carbon black, non-activated, mineral origin”
- International Civil Air Organization – Technical Instructions (ICAO – Ti)
  - Note: listed as “carbon black, non-activated, mineral origin”
- International Maritime Dangerous Goods Code (IMDG)
  - Note: listed as “carbon black, non-activated, mineral origin”
- United Nations Recommendations on the Transport of Dangerous Goods
- United States Department of Transportation Hazardous Materials Regulations (DOT)
- GGVS and GGVE

Additional Information: The International Carbon Black Association organized the testing of seven ASTM reference carbon blacks according to the UN method, Self-Heating Solids. All seven reference carbon blacks were 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.

14.2 **UN proper shipping name**
Not applicable

14.3 **Transport hazard class(es)**
Not applicable

14.4 **Packing group**
Not applicable

14.5 **Environmental hazards**
Not applicable

14.6 **Special precautions for user**
Not applicable

14.7 **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**
Not applicable

**SECTION 15: Regulatory information**

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

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

<table>
<thead>
<tr>
<th>Country</th>
<th>Database Name</th>
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</thead>
<tbody>
<tr>
<td>Australia</td>
<td>AICS</td>
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<tr>
<td>Canada</td>
<td>DSL</td>
</tr>
<tr>
<td>China</td>
<td>IECSC</td>
</tr>
<tr>
<td>Europe (EU)</td>
<td>EINECS (EINECS-RN: 215-609-9)</td>
</tr>
<tr>
<td>Japan</td>
<td>ENCS (10-3074/5-3328 and 0-073/5-5222)</td>
</tr>
<tr>
<td>Korea</td>
<td>TCC-ECL (KE-04682)</td>
</tr>
</tbody>
</table>
Philippines: PICCS  
Taiwan: CSNN  
New Zealand: HSNO (approval code HSR002801)  
USA: TSCA

15.1.2 Germany  
WGK (Water Endangering Class)  nwg (not water endangering): 1742

15.1.3 Switzerland  
Giftklasse (Poison Class) Toxic Category tested and found to be not toxic: G-8938

15.1.4 United States  
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.

SARA 311/312  
Immediate health hazard: No  
Delayed (chronic) health hazard: Yes  
Sudden release of pressure hazard: No  
Reactive hazard: No

California Proposition 65  
“Carbon black (airborne, unbound particles of respirable size)” is a California Proposition 65 listed substance. Please note that all three listing qualifiers (airborne, unbound (not bound within a matrix), and respirable size (10 micrometers or less in diameter)) must be met for this substance to be considered a Proposition 65 substance.

US State Right-to-Know Standards  
Carbon black CAS # 1333-86-4 is listed or regulated under the right to know standards in the states of New Jersey, Pennsylvania and Massachusetts.  
For Louisiana: Right-to-know legislation requires inventory reporting through Community Right-to-Know when the quantity of carbon black exceeds 500 pounds on any given day. Spills or releases beyond the site of the facility of greater than 5,000 pounds are required to be immediately reported to the state Emergency Response Commission via the Office of the State Police, Transportation and Environmental Safety Section, Hazardous Material Hotline, (504) 925-6596 (collect calls accepted 24 hours a day).

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

15.2 Chemical Safety Assessment  
A Chemical Safety Assessment has been carried out for this substance.

**SECTION 15: Regulatory information**

NFPA (National Fire Protection Association) Rating:  
HMIS® III Rating:  
<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Reactivity</th>
<th>Health</th>
<th>Flammability</th>
<th>Physical hazard</th>
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<tbody>
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<td>1</td>
<td>0</td>
<td>1*</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

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

**References:**
1) Baan, R. Carcinogenic Hazards from Inhaled Carbon Black, Titanium Dioxide, and Talc not Containing Asbestos or Asbestiform Fibers: Recent Evaluations by an IARC Monographs Working Group. Inhalation Toxicology, 19 (Suppl. 1); 213-228 (2007).

2) UN: Globally harmonized system of classification and labelling of chemicals (GHS). Revision 3, 2009. [Link](http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html)


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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