

SAFETY DATA SHEET

PCBL Limited
Version No: 1.08
Review Date: 13 May 2024

Issue Date: 20 October 2023
S.REACH.GBR.EN

Safety Data Sheet (Conforms to Commission Regulations (EU) No 2020/878 of 18 June 2020 amending Annex II to Regulation (EC) No 1907/2006)

SECTION 1 - IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

1.1. Product Identifier

| | |
|--------------------------------|---|
| Product name: | CARBON BLACK |
| Chemical Name: | Carbon Black |
| Synonyms: | Furnace Black |
| Nanoform: | Carbon black is classified as a nanoform by Commission Regulation (EU) 2018/1881. |
| This SDS is valid for grades | Orient Black - N110, N115, N121, N134, N219, N220, N231, N234, N299, N326, N330, N330B, N330T, N339, N347, N351, N375, N550, N550LG, N650, N660, N660LP, N762, N765, N772, N774, P435, PRD006, PRD016, PRD018, PRD020, PRD021. Royale Black - P353, P537, P824, P8242, P842, PP805, PI101, PI102, PI103, PI101i, PI103i, PI109, PI137, PF401, PF402, PF606, PC501, PC502, PC503, PC505, PP1201, PP801, PP802F, PP802, PP803, PP804, PE201, PE204, PF1402, PFEXP, PP131, PP802S, PP803K, P901, EI37, EI98, EI215, Energia260, Energia270, Energia360, Energia361, Energia460, Energia560, Energia870, Energia871, Energia880, EP232, Bleumina201, Bleumina214, Bleumina216, Bleumina 217, Bleumina218, Bleumina219, Bleumina221, Bleumina223, Bleumina312, Bleumina361, Bleumina 371, Bleumina381, Bleumina391, NuTone21, NuTone29, NuTone36, NuTone37, NuTone98, NuTone302, NuTone303, NuTone305, NuTone306, NuTone310, NuTone313, NuTone320, NuTone324, NuTone350, NuTone351, NuTone373, NuTone390, PCEXP, PCEXP1, PCEXP2, PCLi. CARBONEXT - CARBONEXT10, CARBONEXT20, CARBONEXT40, CARBONEXT50, CARBONEXT60. |
| Proper shipping name: | CARBON BLACK |
| Chemical Composition: | Substantially elemental carbon, C |
| CAS number: | 1333-86-4 |
| EC number/EINECS: | 215-609-9 |
| Index number: | Not Available |
| REACH registration number: | 01-2119384822-32-0101 |
| KKDIK pre-registration number: | 05-0000409821-03-0000 |

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

| | |
|---------------------------|---|
| Relevant identified uses: | Used in Rubber/Plastics/Paints/Coatings/Ink/Battery and other applications as per manufacturer's advice |
| Uses advised against: | Not to be used as a skin tattooing pigment, directly as cosmetic. According to manufacturer's directions. |

1.3. Details of the supplier of the safety data sheet

| | |
|--------------------------|---|
| Registered company name: | PCBL Limited |
| Address: | 31, Netaji Subhas Road, Kolkata, West Bengal, INDIA - 700 001 |
| Telephone: | +91-33-66251443 |
| e-mail: | pcbl.rubbtech@rpsg.in, pcbl.specialtyblack@rpsg.in |
| Website: | www.pcbltd.com |
| CIN number: | L23109WB1960PLC024602 |
| Only Representative: | TÚV SÜD Iberia, S.A.U. Ronda Can Fatjó 13, 08290 Cerdanyola del Vallès Barcelona (Spain) Tel.:+34 93 594 44 80 https://www.tuvsud.com/es |

1.4. Emergency telephone number

| | |
|------------------------------|-------------------------------------|
| Association / Organisation: | PCBL Limited |
| Emergency telephone numbers: | +91-9830600474/6292208335 (24 Hrs.) |

SECTION 2 - HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Not a hazardous substance according to Regulation (EC) 1272/2008 (CLP).

2.2. Label Elements

| | |
|----------------------------------|------|
| Signal Word: | None |
| Hazard statements: | None |
| Precautionary statements: | None |

2.3. Other hazards

This substance is classified as hazardous as a combustible dust by the United States 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200) and the Canadian Hazardous Products Regulation (HPR) 2015. The signal word, hazard statement and precautionary statements in the United States and Canada are: WARNING May form combustible dust concentrations in air. Keep away from all ignition sources including heat, sparks and flame and dust accumulations to minimize explosion hazard.

Do not expose to temperatures above 300°C. Hazardous products of combustion can include carbon monoxide (CO), carbon dioxide (CO₂), oxides of sulfur, and organic products. May cause reversible mechanical irritation to the eyes, skin and respiratory tract especially at concentrations above the occupational exposure limit.

| | |
|-------------------------------|---|
| Principal Routes of Exposure: | Inhalation, Eye contact, Skin Contact |
| Eye Contact: | May cause mechanical irritation. Avoid contact with eyes. |
| Skin Contact: | May cause mechanical irritation, soiling, and skin drying. Avoid contact with skin. No cases of sensitisation in humans have been reported. |
| Inhalation: | Dust may be irritating to the respiratory tract. Provide appropriate local exhaust ventilation at machinery and at places where dust can be generated. See also Section 11. |
| Ingestion: | Adverse health effects are not expected. See Section 11. |
| Carcinogenicity: | 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). Animal Carcinogen with Unknown Relevance to Humans (Category A3 Carcinogen) as per ACGIH cancer classification. Not listed as a carcinogen by NTP, ACGIH, OSHA or the European Union. See also Section 11. |

| | |
|---|------------------------------|
| Target Organ Effects | Lungs |
| Medical Conditions Aggravated by Exposure | Asthma, Respiratory disorder |

Potential Environmental Effects None known. See Section 12

SECTION 3 - COMPOSITION / INFORMATION ON INGREDIENTS**3.1. Substances**

| | Number | %[weight] | Name | Nanoform classification by Commission Regulation (EU) 2018/1881 |
|------------------------------|-----------------------|-----------|--------------|--|
| 1. CAS No | 1333-86-4 | 100 | | Over 50% of the constituent particles are in the size range of 1 -100 nm |
| 2. EC No | 215-609-9 | | | |
| 3. Index No | Not Available | | Carbon Black | Particle Size Distribution |
| 4. REACH Registration No | 01-2119384822-32-0101 | | | D10: 14 - 181 nm D50: 30 - 299 nm D90: 40 - 487 nm |
| 5. KKDIK Pre-Registration No | 05-0000409821-03-0000 | | | Type of distribution: Number distribution Measurement techniques: DCP |
| 6. State: | Amorphous 100% | | | Physical state: Aggregates Agglomeration state: Micron-sized agglomerates |

3.2. Mixtures

Not Applicable

SECTION 4 - FIRST AID MEASURES**4.1. Description of first aid measures****Eye Contact:**

Carbon black is not a chemical eye irritant If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Treat symptomatically for mechanical irritation. Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Seek medical attention without delay; if pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact:

Carbon black is not a chemical skin irritant. Carbon black dust or powder may cause drying of the skin with repeated and prolonged contact. If skin or hair contact occurs:

- Flush skin and hair with running water (and soap if available).
- Treat symptomatically for mechanical irritation
- Seek medical attention in event of irritation.

Inhalation:

Carbon black is not a respiratory irritant, as defined by the Occupational Safety and Health Administration (OSHA) or UN GHS.

- If fumes or combustion products are inhaled remove from contaminated area. Lay the patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block the airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained.

Ingestion:

No adverse effects are expected from carbon black ingestion

- Do not induce Vomiting
- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

4.2. Most important symptoms and effects, both acute and delayed

No Known Effects

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 - FIREFIGHTING MEASURES**5.1. Extinguishing media**

- Use foam, carbon dioxide (CO₂), dry chemical, nitrogen (N₂), or water fog. A fog spray is recommended if water is used.
- Do not use a high-pressure water stream as this may spread burning powder (burning powder will float and may spread fire).
- Do not use a high-pressure media which could cause the formation of a potentially explosible dust-air mixture.

5.2. Special hazards arising from the substrate or mixture**Incompatible media**

- Avoid contamination with oxidising agents, i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.
- Explosion: Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and 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 that has been on fire should be observed closely for at least 48 hours to ensure no smouldering material is present .*
- Carbon black can burn or smolder at temperatures > 300°C (>572°F) 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.

5.3. Advice for firefighters**Fire Fighting:**

- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Wet carbon black produces very slippery walking surfaces.

Fire/Explosion Hazard:

- Combustible solid which burns but propagates flame with difficulty; it is estimated that most organic dusts are combustible (circa 70%) - according to the circumstances under which the combustion process occurs, such materials may cause fires and / or dust explosions.

SECTION 6 - ACCIDENTAL RELEASE MEASURES**6.1. Personal precautions, protective equipment and emergency procedures**

- Wear appropriate personal protective equipment and respiratory protection to avoid skin soiling and possible mechanical irritation to the eyes and upper respiratory tract from airborne dust.
- 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.
- Avoid dispersal of dust in the air (e.g., refrain from clearing dust surfaces with compressed air). Remove ignition sources.
- When airborne contaminants and concentrations cannot be immediately assessed self-contained breathing apparatus (SCBA) should be used.
- Avoid dispersal of dust in the air. Non-sparking tools should be used.

6.2. Environmental precautions

- Carbon black is not a hazardous substance under the Comprehensive Environmental Response, Compensation and Liability Act (40 CFR 302), or the Clean Water Act (40 CFR 116), or a hazardous air pollutant under the Clean Air Act Amendments of 1990 (40 CFR 63).
- 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 material for containment and cleaning up**Minor Spills:**

- Clean up waste regularly and abnormal spills immediately.
- Small spills should be vacuumed when possible. A vacuum equipped with HEPA (high-efficiency particulate air) filtration is recommended.
- Wear protective clothing, gloves, safety glasses and a dust respirator.

Major Spills:

- Moderate Hazard.
- Dry sweeping is not recommended. Water spray will produce very slippery walking surfaces and will not result in satisfactory removal of carbon black contamination.
- Large spills may be shoveled into containers. See Section 13.

6.4. Reference to other sections

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 - HANDLING AND STORAGE**7.1. Precautions for safe handling****Safe handling****NOTE:**

- Minimise dust generation and accumulation on surfaces. Use local exhaust ventilation or other appropriate engineering controls to maintain dust below the occupational exposure limit. Avoid contact with skin and eyes.
- 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.
- 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.
- Routine housekeeping should be instituted to ensure that dust do not accumulate on surfaces. Refer to NFPA 654 for good practices. 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.
- 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. 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.

Fire and explosion Protection

See section 5

7.2. Conditions for safe storage, including any incompatibilities

Keep in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Do not store together with strong oxidizing agents. Do not store together with volatile chemicals as they may be adsorbed onto product. Keep in properly labeled containers.

Carbon black is not classifiable as a Division 4.2 self-heating substance under the UN test criteria. However, the UN criteria for determining if a substance is self-heating is volume dependent, i.e., the auto-ignition temperature decreases with increasing volume. This classification may not be appropriate for large volume storage containers. Before entering vessels and confined spaces containing carbon black, test for adequate oxygen, flammable gases and potential toxic air contaminants. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosible mixture if they are released in the atmosphere in sufficient concentrations.

Suitable container:

- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.
- Store in a dry location away from ignition sources & away from oxidizers

Storage incompatibility:**For carbon powders:**

- Avoid oxidising agents, reducing agents.
- Reaction with finely divided metals, bromates, chlorates, chloramine monoxide, dichlorine oxide, iodates, metal nitrates, oxygen difluoride, peroxyformic acid, peroxyfuroic acid and trioxigen difluoride may result in an exotherm with ignition or explosion. Less active forms of carbon will ignite or explode on suitably intimate contact with oxygen, oxides, peroxides, oxosalts, halogens, interhalogens and other oxidising species.
- Before entering vessels and confined spaces containing carbon black, test for adequate oxygen, flammable gases and potential toxic air contaminants, e.g., CO.

7.3. Specific end use(s)

See section 1.2

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Occupational Exposure Limits (OEL)

The table below is a summary. Please see the specific legislation for complete information
 Representative occupational exposure limits currently available for carbon black (CAS number: 1333-86-4). Country listing not all inclusive.

| Country | Concentration in mg/m ³ | |
|--------------------|------------------------------------|---------------------|
| Argentina | 3.5 TWA | |
| Australia | 3 TWA | inhalable |
| Belgium | 3.6 TWA | |
| Brazil | 3.5 TWA | |
| Canada(Ontario) | 3 TWA | |
| China | 4 TWA | |
| | 8 STEL | |
| Colombia | 3 TWA | inhalable |
| Czech Republic | 2 TWA | |
| Egypt | 3.5 TWA | |
| Finland | 3.5 TWA | |
| | 7 STEL | |
| France - INRS | 3.5 TWA/VME | inhalable |
| Germany - AGW | 1.5 TWA | Respirable |
| | 4 TWA | inhalable |
| Germany - TGRS 900 | 3 TWA | Respirable |
| | 10 TWA | inhalable |
| Hong kong | 3.5 TWA | |
| Indonesia | 3.5 TWA/NABs | |
| Ireland | 3.5 TWA | |
| | 7 STEL | |
| Italy | 3.5 TWA | inhalable |
| Japan - MHLW | 3 | |
| Japan - SOH | 4 TWA | |
| | 1 TWA | Respirable |
| Korea | 3.5 TWA | |
| Malaysia | 3.5 TWA | |
| Mexico | 3.5 TWA | |
| Russia | 4 TWA | |
| Spain | 3.5 TWA | (VLA-ED) |
| Sweden | 3 TWA | |
| United Kingdom | 3.5 TWA | inhalable |
| | 7 STEL | inhalable |
| EU REACH DNEL | 2 | inhalable |
| United States | 3.5 TWA | OSHA-PEL |
| | 3 TWA | ACGH-TLV® inhalable |
| | 3.5 TWA | NIOSH - REL |

NOTE:

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

(2) The Carbon Black REACH Consortium developed a Derived No Effect Level (DNEL) for carbon black of 2 mg/m³ inhalable based on human health studies.

*Please consult the current version of the standard or regulation that may apply to your operations.

| | |
|-------------------|---|
| ACGIH® | American Conference of Governmental Industrial Hygienists |
| mg/m ³ | milligrams per cubic meter |
| NIOSH | National Institute for Occupational Safety and Health |
| OES | occupational exposure standard |
| DNEL | Derived no-effect level |
| 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 |
| OSHA | Occupational Safety and Health Administration |

8.2. Exposure controls

8.2.1. Appropriate engineering controls

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

Local exhaust ventilation recommended for all transfer points to mixers, blenders, batch feeding processes and point sources that may release dust to work environment. Recommend mechanical handling to minimise human contact with dust.

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.

8.2.2. Personal protection



Eye and face protection:

- Safety glasses with side shields. Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task.

Skin protection:

- Wear general protective clothing to minimise 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 minimise soiling. Wash hands and other exposed skin with mild soap and water.

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 minimise 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:
 - US: NIOSH approval under 42 CFR 84 required. OSHA (29 CFR 1910.134). ANSI Z88.2-1992 (Respiratory Protection).
 - EU: CR592 Guidelines for the Selection and Use of Respiratory Protection
 - Germany: DIN/EN 143 Respiratory Protective Devices for Dusty Materials.
 - UK: BS 4275 Recommendations for the Selection, Use and Maintenance of Respiratory Protective Equipment. HSE Guidance Note HS (G)53 Respiratory Protective Equipment.

Other protection:

- Overalls.
- P.V.C. apron.
- Barrier cream.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES**9.1. Information on basic physical and chemical properties**

| | | | |
|---|-----------------------------------|---|--|
| Appearance | Black colour | Vapour density (Air = 1) | Not Applicable |
| Physical state | Amorphous solid/Powder/ Granules. | Relative density (Water = 1) | 1.7-1.9 at 20°C |
| Odour | Odourless | Bulk density (Water = 1) | 200 - 680 kg/m ³ Granules |
| Odour threshold | Not Applicable | Bulk density (Water = 1) | 100-420 kg/m ³ Powder |
| pH (as supplied) | 2-10 [50 g/l water, at 20°C] | Partition coefficient n-octanol / water | Not Applicable |
| Melting point / freezing point (°C) | > 3500 °C | Auto-ignition temperature (°C) | >140 |
| Initial boiling point and boiling range (°C) | > 4000 °C | Minimum ignition temperature: | >500°C (BAM Furnace) VDI 2263 (cloud) |
| Flash point (°C) | Not Applicable | | > 400°C VDI 2263 (layer) |
| Evaporation rate | Not Applicable | Minimum ignition energy | > 10,000 mJ VDI 2263 |
| Flammability (as defined by OSHA 1910.1200) | Not Applicable | Decomposition temperature | Not Available |
| <i>Explosive Limits (dust):</i> | | Viscosity (cSt) | Not Applicable |
| <i>-Furnace black: (VDI 2263)</i> | | Molecular weight (g/mol) | 12.01 |
| <i>Lower</i> | 50 g/m ³ | Taste | Not Available |
| <i>Explosive Properties:</i> | | Explosive properties | Dust may form explosible mixture in air |
| <i>Dust Explosion Class (VDI 2263, EC 84/449)</i> | ST1 | Oxidising properties | Not Applicable |
| <i>Maximum Absolute Explosion Pressure</i> | 10 bar | Surface Tension (dyn/cm or mN/m) | Not Applicable |
| <i>Maximum Rate of Pressure Rise</i> | 30-100 bar/sec | Volatile Component (%vol) | < 2.5% (non-oxidised Carbon Black) 2 - 8% (oxidised Carbon Black) |
| Vapour pressure (kPa) | Not Applicable | Gas group | Not Applicable |
| Solubility in water (g/L) | Not Soluble | pH as a solution (1%) | Not Applicable |

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

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.)

"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)

Other information: Particle Characteristics: Nanoform (Spherical, Amorphous)

SECTION 10 - STABILITY AND REACTIVITY**10.1. Reactivity:**

Stable under normal ambient conditions. May react exothermically upon contact with strong oxidizers.

10.2. Chemical stability:

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

10.3. Possibility of hazardous reactions:

Hazardous polymerisation will not occur under normal conditions.

10.4. Conditions to avoid:

Avoid high temperatures >300°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.

10.5. Incompatible materials:

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

10.6. Hazardous decomposition products:

Dust may form explosible an mixture in air. Avoid dust formation. Do not create a dust cloud by using a brush or compressed air. Take precautionary measures against static discharges. All metal parts of the mixing and processing equipment must be earthed/grounded. Ensure all equipment is electrically earthed/grounded before beginning transfer operations.

SECTION 11 - TOXICOLOGICAL INFORMATION**11.1. Information on toxicological effects****Inhaled:**

Limited evidence or practical experience suggests that the material may produce irritation of the respiratory system, in a significant number of individuals, following inhalation. In contrast to most organs, the lung can respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may, however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.

Ingestion:

The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health).

Skin Contact:

The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure is kept to a minimum and that suitable gloves be used in an occupational setting. Repeated exposure may cause skin cracking, flaking or drying following normal handling and use. Open cuts, abraded or irritated skin should not be exposed to this material. Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects.

Eye:

Limited evidence exists, or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals and/or is expected to produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur. Symptoms of exposure by the eye to carbon particulates include irritation and a burning sensation. Following an industrial explosion, fine particles become embedded in the cornea and conjunctiva resulting in an inflammation which persisted for 2-3 weeks.

Chronic:

On the basis, primarily, of animal experiments, concern has been expressed that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment. Prolonged or repeated skin contact may cause drying with cracking, irritation and possible dermatitis following. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Chronic inhalation exposure of production workers has caused decreased pulmonary function and myocardial dystrophy.

TOXICITY

| | | |
|---|--|---|
| Acute Toxicity | <p>Oral LD50 Inhalation LC50 Dermal LD50 Assessment:</p> | <p>LD50/oral/rat > = 8000 mg/kg. (Equivalent to OECD TG 401) No data available No data available Non-toxic after ingestion</p> |
| Carcinogenicity: | <p>The IARC has classified this substance as Group 2B: Possibly Carcinogenic to Humans. DOSH (under Ministry of Human Resource, Malaysia) has classified this substance as Carcinogenicity category 2.</p> | |
| Skin Irritation(Rabbit): | <p>Rabbit: not irritating. (Equivalent to OECD TG 404)</p> | |
| Serious Eye Damage/Irritation (Rabbit): | <p>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.</p> | |
| Sensitisation: | <p>Guinea pig skin (Buehler Test): Not sensitising (OECD TG 406).</p> | |
| Mutagenicity: | <p>In Vitro, Carbon black is not suitable to be tested in bacterial (Ames test) and other in vitro systems because of its insolubility. However, when organic solvent extracts of carbon black have been tested, results showed no mutagenic effects. Organic solvent extracts of carbon black can contain traces of polycyclic aromatic hydrocarbons (PAHs). A study to examine the bioavailability of these PAHs showed that PAHs are very tightly bound to carbon black and not bioavailable. (Born, 2005)</p> | |
| Mutagenicity: | <p>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. This observation is believed to be rat specific and a consequence of "lung overload" (Driscoll, 1997) which led to chronic inflammation and release of reactive oxygen species. This is considered to be a secondary genotoxic effect and, thus, carbon black itself would not be considered to be mutagenic. Assessment: In vivo mutagenicity in rats occurs by mechanisms secondary to a threshold effect and is a consequence of "lung overload," which leads to chronic inflammation and the release of genotoxic oxygen species. This mechanism is considered to be a secondary genotoxic effect and, thus, carbon black itself would not be considered to be mutagenic.</p> | |
| Reproductive and Developmental Toxicity: | <p>ASSESSMENT: No effects on reproductive organs or fetal development have been reported in long-term repeated dose toxicity studies in animals.</p> | |
| STOT - single exposure: | <p>ASSESSMENT: Based on available data, specific target organ toxicity is not expected after single oral, single inhalation, or single dermal.</p> | |
| STOT - Repeated Exposure: | <p>Animal Toxicity Oral Assessment Based on available data, specific target organ toxicity is not expected after repeated oral exposure.</p> <p>Dermal Assessment Based on available data and the chemical-physical properties (insolubility, low absorption potential), specific target organ toxicity is not expected after repeated dermal exposure.</p> | |
| 11.2. Information on other hazards | | |
| Endocrine Disrupting properties | <p>The substance does not contain endocrine disrupting properties components according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher</p> | |

SECTION 12 - ECOLOGICAL INFORMATION**12.1. Toxicity**

Acute fish toxicity: LC50 (96 h) > 1000 mg/l, Species: Brachydanio rerio (zebra fish),
 Acute invertebrate toxicity: Method: OECD Guideline 203, EC50 (24 h) > 5600 mg/l, Species: Daphnia magna (water flea)
 Acute algae toxicity: Method: OECD Guideline 202, EC 50 (72 h) >10,000 mg/l, NOEC 50 >10,000 mg/l, Species: Scenedesmus subspicatus
 Activated sludge: Method: OECD Guideline 201, EC0 (3 h) >= 800 mg/l, Method: DEV L3 (TTC test)

12.2. Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances

12.3. Bioaccumulative potential

Not expected due to physicochemical properties of the substance.

12.4. Mobility in soil

Not expected to migrate. Insoluble.

12.5. Results of PBT and vPvB assessment

This substance does not fulfil the criteria for PBT or vPvB.

12.6. Endocrine disrupting properties

None. See Section 11.2.

12.7. Other adverse effects

No information available

SECTION 13 - DISPOSAL CONSIDERATIONS

EU Waste Code: 61303 per Council Directive 75/422/EEC
 RCRA: Not a hazardous waste under U.S. RCRA, 40 CFR 261
 Canadian Waste Classification: Not a hazardous waste under provincial regulations.

13.1. Waste treatment methods

Disclaimer: Information in this section pertains to the product as shipped in its intended composition as described in Section 3 of this SDS. Contamination or processing may change waste characteristics and requirements. Regulations may also apply to empty containers, liners or rinsate. State/provincial and local regulations may be different from federal regulations.
 Waste should not be released to sewers. The product, as supplied, can be burned in suitable incineration facilities or should be disposed of in accordance with the regulations issued by the appropriate federal, state and local authorities. Same consideration should be given to containers and packaging.

SECTION 14 - TRANSPORT INFORMATION**Labels Required**

Marine Pollutant: No
 HAZCHEM:

Land transport (ADR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

| | | | |
|----------------------------------|---|------------------------------------|------------------|
| 14.1. UN number | Not Applicable | 14.4. Packing group | Not Applicable |
| 14.2. UN proper shipping name | Not Applicable | 14.5. Environmental hazard | No relevant data |
| 14.3. Transport hazard class(es) | Class: Not Applicable Sub risk: Not Applicable | 14.6. Special precautions for user | Not Applicable |

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

| | | | |
|----------------------------------|---|------------------------------------|------------------|
| 14.1. UN number | Not Applicable | 14.4. Packing group | Not Applicable |
| 14.2. UN proper shipping name | Not Applicable | 14.5. Environmental hazard | No relevant data |
| 14.3. Transport hazard class(es) | Class: Not Applicable Sub risk: Not Applicable | 14.6. Special precautions for user | Not Applicable |

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

| | | | |
|----------------------------------|---|------------------------------------|------------------|
| 14.1. UN number | Not Applicable | 14.4. Packing group | Not Applicable |
| 14.2. UN proper shipping name | Not Applicable | 14.5. Environmental hazard | No relevant data |
| 14.3. Transport hazard class(es) | Class: Not Applicable Sub risk: Not Applicable | 14.6. Special precautions for user | Not Applicable |

Inland waterways transport (ADN): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

| | | | |
|----------------------------------|---|------------------------------------|------------------|
| 14.1. UN number | Not Applicable | 14.4. Packing group | Not Applicable |
| 14.2. UN proper shipping name | Not Applicable | 14.5. Environmental hazard | No relevant data |
| 14.3. Transport hazard class(es) | Class: Not Applicable Sub risk: Not Applicable | 14.6. Special precautions for user | Not Applicable |

Transport in bulk according to Annex II of MARPOL 73 / 78 and the IBC code

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

- Canadian Transport of Dangerous Goods Regulation
- European Transport of Dangerous Goods Regulation
- GGVs, GGVE, RID, ADR, IMDG Code, ICAO-TI
- United Nations Recommendations on the Transport of Dangerous Goods
- United States Department of Transportation Hazardous Materials Regulations (DOT)
- International Air Transport Association (IATA)

SECTION 15 - REGULATORY INFORMATION**15.1. Safety, health and environmental regulations / legislation specific for the substance or mixture**

Carbon Black (1333-86-4) is found on the following regulatory lists

"OECD List of High Production Volume (HPV) Chemicals", "International Numbering System for Food Additives", "International Council of Chemical Associations (ICCA) - High Production Volume List", "UK Workplace Exposure Limits (WELs)", "Sigma-Aldrich Transport Information", "Acros Transport Information", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs", "Europe Commission Regulation (EU) No 10/2011 of 14 January 2011 on plastic materials and articles intended to come into contact with food - Annex I: Substances", "Europe Substances Listed in EU Directives on Plastics in Contact with Food", "EU Cosmetic Directive 76/768/EEC Annex IV Part 1: List of Colouring Agents Allowed for Use in Cosmetic Products (German)", "Europe European Chemicals Agency (ECHA) List of substances identified for registration in 2010", "EU Cosmetic Directive 76/768/EEC Annex IV Part 1: List of Colouring Agents Allowed for Use in Cosmetic Products (English)", "Europe European Chemicals Agency (ECHA) List of Registered Phase-in Substances", "Europe European Chemicals Agency (ECHA) List of Registered Substances", "European Union (EU) Inventory of Ingredients used in Cosmetic Products", "EU Cosmetic Directive 76/768/EEC Annex IV Part 1: List of Colouring Agents Allowed for Use in Cosmetic Products (Danish)", "EU approved additives", "European Trade Union Confederation (ETUC) Priority List for REACH Authorisation", "EU Directive 67/548/EEC: Not defined as a dangerous substance", "European List of Notified Chemical Substances (ELINCS)", "Europe ECHA Registered Substances - Classification and Labeling - DSD-DPD", "European Chemical Agency (ECHA) Classification & Labeling Inventory - Chemwatch Harmonised classification", "Europe ECHA Registered Substances - Classification and Labelling - GHS", "Industrial Safety and Health Act (KOREA)", "European Chemical Agency (ECHA) Classification & Labeling Inventory - Notified classification and labelling according to CLP criteria", "Europe European Chemicals Agency (ECHA) REACH Registration Numbers", "Swiss Poison Class: G-8938", "Water hazard class (WGK Number: 1742): nwg (not water endangering)".

Carbon Black (1333-86-4*) is found on the following regulatory lists

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
 DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List
 EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
 ENCS - Japan Existing and New Chemical Substances
 IECS - China Inventory of Existing Chemical Substances
 KECI - Korea Existing Chemicals Inventory
 PICCS - Philippines Inventory of Chemicals and Chemical Substances
 AICS - Australian Inventory of Chemical Substances
 NZIoC - New Zealand Inventory of Chemicals
 TCSI - Taiwan Chemical Substance Inventory
 ICOP - The Industry Code of Practice on Chemical Classification and Hazard Communication (Amendment) 2019, Malaysia

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable - : 67/548/EEC, 1999/45/EC, 98/24/EC, 92/85/EC, 94/33/EC, 91/689/EEC, 1999/13/EC, Regulation (EU) No 453/2010, Regulation (EC) No 1907/2006, Regulation (EC) No 1272/2008 and their amendments as well as the following British legislation:

- The Control of Substances Hazardous to Health Regulations (COSHH) 2002
- COSHH Essentials
- The Management of Health and Safety at Work Regulations 1999

15.2. Chemical safety assessment

For further information, please look at the Chemical Safety Assessment and Exposure Scenarios prepared by your Supply Chain if available.

ECHA SUMMARY

| Ingredient | CAS number | Index No | ECHA Dossier |
|-------------------------------|-----------------------------------|--------------------------------|--------------------------|
| carbon black | 1333-86-4 | Not Available | Not Available |
| Harmonisation (C&L Inventory) | Hazard Class and Category Code(s) | Pictograms Signal Word Code(s) | Hazard Statement Code(s) |
| Not Available | Not Classified | Not Available | Not Available |

SECTION 16 - OTHER INFORMATION

Classification of the preparation and its individual components has drawn on official and authoritative sources.

PAH : < 0.1% (1000 ppm), as per latest ECHA List

Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:

- EN 16 Personal eye-protection
- EN 340 Protective clothing
- EN 374 Protective gloves against chemicals and micro-organisms
- EN 13832 Footwear protecting against chemicals
- EN 133 Respiratory protective devices

This document is copyright. Apart from any fair dealing for the purposes of private study, research, review or criticism, as permitted under the Copyright Act, no part may be reproduced by any process without written permission from PCBL Limited

Disclaimer: The information set forth is based on information that PCBL Limited believes to be accurate and for the product when packed and stored as per the recommended conditions. No warranty, expressed or implied, is intended. The information is provided solely for your information and consideration and PCBL Limited assumes no legal responsibility for use or reliance thereon. In the event of a discrepancy between the information on the non-English document and its English counterpart, the English version shall supersede.

Prepared by: PCBL Limited