

Safety Data Sheet

Prepared in accordance with the United States Hazard Communication Standard: 29 CFR 1910.1200 (2012),
Canada's Workplace Hazardous Materials Information System (SOR/2015-17), and
Mexico's NORMA MEXICANA NOM-018-STPS-2015

HIGH PURITY CARBON BLACK

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

1.1. GHS Product Identifier:

Chemical name: High Purity Furnace Black, Carbon Black

Product Name: KOHLENSTOFF® ONYX 300F

This SDS is valid for the following grades: KOHLENSTOFF® ONYX 300F

1.2. Recommended use of the chemical: Additive for plastic and rubber; Pigment for coatings, paints and lacquers; Special applications such as semi conductive compounds, UV filters, additive for batteries, refractories; Indirect food additive as a colorant for polymers, Food contact substance

1.3. Restrictions on use: Not recommended for use as a human tattoo pigment.

1.4. Supplier:

Supplier:	HIMADRI SPECIALITY CHEMICAL LTD
Address:	321 Billerica Road, Suite 100, Chelmsford, MA 01824
Telephone:	+1 (978) 729-9771
E-mail:	carbonblack@himadri.com

1.5. Emergency Telephone Numbers:

USA: 1-800-424-9300 / +1 (703) 527-3887 (CHEMTREC)

International : +1 (703) 741-5970 (CHEMTREC)

SECTION 2: Hazard(s) Identification

2.1. Classification of the substance or mixture:

Combustible dust

2.2. GHS Label elements:

Signal Word: WARNING

Hazard Statement: May form combustible dust concentrations in air

Pictogram: None

Safety Data Sheet

Prepared in accordance with the United States Hazard Communication Standard: 29 CFR 1910.1200 (2012),
Canada's Workplace Hazardous Materials Information System (SOR/2015-17), and
Mexico's NORMA MEXICANA NOM-018-STPS-2015

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

2.3. Other Information:

May cause mechanical irritation. Dust may be irritating to the respiratory tract. Carbon black may form an explosible dust-air mixture if dispersed. Carbon black can burn or smoulder at temperatures greater than 400°C (>752°F) releasing hazardous products such as carbon monoxide (CO), carbon dioxide, and oxides of sulfur. Do not expose to temperatures above 400° C.

SECTION 3: Composition/information on ingredients

3.1. Substances:

Carbon Black (amorphous) 100%

Common name(s), synonym(s) of the substance: furnace black

CAS number: 1333-86-4

Hazardous Material Information Review Act Registry Number (HMIRA): Not applicable

Date HMIRA Filed & Date Exemption Granted: Not applicable

HS Code: 2803.00.00

SECTION 4: First-aid measures

4.1. Description of first-aid measures:

Inhalation: Take affected persons into fresh air. If necessary, restore normal breathing through standard first aid measures. Seek medical attention if symptoms persist.

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

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

Ingestion: Do NOT induce vomiting. Rinse mouth thoroughly with water. 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:

Symptoms: Irritating to the eyes and respiratory tract if exposed above the occupational exposure limits. See Section 11.

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

Note to physicians: Treat symptomatically

Safety Data Sheet

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Canada's Workplace Hazardous Materials Information System (SOR/2015-17), and
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SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media: Use foam, carbon dioxide (CO₂), dry chemical, or water fog. A fog spray is recommended if water is used.

Unsuitable extinguishing media: Do not use high pressure media which could cause the formation of a potentially explosible dust-air mixture. Do not use a solid water stream as it may scatter and spread the fire.

5.2. Special hazards arising from the substance or mixture:

Special hazards arising from the chemical: 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 smouldering material is present. Burning produces irritant fumes. Product is insoluble and floats on water. If possible, try to contain floating material

Hazardous Combustion Products: Carbon monoxide (CO), carbon dioxide (CO₂), and oxides of sulphur.

Explosion data:

Sensitivity to mechanical impact None

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

5.3. Advice for fire fighters:

Special protective equipment for fire-fighters: Wear full protective fire fighting gear, including self-contained breathing apparatus (SCBA). Wet carbon black produces very slippery walking surfaces

Safety Data Sheet

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Mexico's NORMA MEXICANA NOM-018-STPS-2015

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Wet carbon black produces slippery walking surfaces. Avoid dust formation. Wear appropriate personal protective equipment and respiratory protection. Ensure adequate ventilation. See Section 8

For emergency responders: Use personal protective equipment recommended in section 8.

6.2. Environmental precautions:

Environmental precautions: Contain spilled product on land, if possible. As a matter of good practice, minimize contamination of sewage water, soil, groundwater, drainage systems, or bodies of water. Any product that reaches water should be contained. Local authorities should be advised if significant spillage cannot be contained. See section 12 for Ecological Information

6.3. Methods and materials for containment and cleaning up:

Method for containment: Prevent further leakage or spillage if safe to do so. The product is insoluble and floats on water. Any product that reaches water should be contained

Method for cleaning up: Dry sweeping is not recommended. If possible, vacuum using an explosion-proof vacuum and/or cleaning system suitable for combustible dusts. Cleaning system/vacuum equipped with high efficiency particulate air (HEPA) filtration is recommended. Transfer properly labelled containers. See Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling:

Advice on safe handling: Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Provide appropriate local exhaust to minimize dust formation. Do not use compressed air. Take precautionary measures against static discharges. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Grounding of equipment and conveying systems may be required under certain conditions. Fine dust is capable of penetrating electrical equipment and may cause electrical shorts. Safe work practices include the elimination of

Safety Data Sheet

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Canada's Workplace Hazardous Materials Information System (SOR/2015-17), and
Mexico's NORMA MEXICANA NOM-018-STPS-2015

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. If hot work is required, the immediate work area must be cleared of carbon black dust.

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

7.2. Conditions for safe storage, including any incompatibilities:

Storage Condition: Keep in a dry, cool, and well-ventilated location. Store away from heat, ignition sources, volatile chemicals and strong oxidizers. Do not store together with volatile chemicals as they may be adsorbed onto the product.

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

Before entering vessels and confined spaces containing carbon black, test for adequate oxygen, flammable gases and potential toxic air contaminants. Do not allow dust to accumulate on surfaces.

Incompatible materials: Strong oxidizers. Volatile chemicals

SECTION 8: Exposure controls/personal protection

8.1. Control parameters:

Exposure limit values

Alberta, Canada:	3.5 mg/m ³ TWA
British Columbia, Canada	3.0 mg/m ³ TWA, inhalable
Ontario, Canada	3.0 mg/m ³ TWA, inhalable particulate matter
Quebec, Canada	3.0 mg/m ³ TWA, inhalable dust
Mexico:	3.5 mg/m ³ TWA
US ACGIH - TLV:	3.0 mg/m ³ TWA, inhalable particulate matter
US OSHA - PEL:	3.5 mg/m ³ TWA

Note: Unless otherwise indicated as "respirable or "inhalable," the exposure limit represents a "total" value.

Safety Data Sheet

Prepared in accordance with the United States Hazard Communication Standard: 29 CFR 1910.1200 (2012),
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8.2. Exposure controls:

Engineering controls: Use process enclosures and/or exhaust ventilation to keep airborne dust concentrations below the occupational exposure limit. Locate eyewash stations and safety showers close to workstations.

Personal Protective Equipment (PPE):

Respiratory: Approved air purifying respirator (APR) for particulates may 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:

- US: OSHA 29 CFR 1910.134, Respiratory Protection; NIOSH approval under 42 CFR 84 required
- EU: CR592 Guidelines for Selection and Use of Respiratory Protective Devices (CEN)
- 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

Hand protection: Wear protective gloves. Use a barrier cream. Wash hands and skin with mild soap and water.

Eye/face protection: Wear safety glasses with side shields or goggles.

Skin protection: Wear general protective clothing to minimize skin contact. Wash clothing daily. Work clothes should not be taken home.

Other: Emergency eyewash and safety showers should be in close proximity. Wash hands and face thoroughly with mild soap before eating or drinking.

Environmental Exposure Controls: In accordance with all local legislation and permit requirements.

Safety Data Sheet

Prepared in accordance with the United States Hazard Communication Standard: 29 CFR 1910.1200 (2012),
Canada's Workplace Hazardous Materials Information System (SOR/2015-17), and
Mexico's NORMA MEXICANA NOM-018-STPS-2015

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance:	pellet
Color:	black
Odor:	odorless
Odor threshold:	not applicable
Melting point/freezing point:	not applicable
Boiling point/range:	not applicable
Vapor pressure:	not applicable
Vapor Density:	not applicable
Oxidizing properties:	not applicable
Flash Point:	not applicable
Flammability:	not classifiable as "Highly flammable" or "Easily Ignitable"
Explosive properties:	Dust may form explosible mixture in air
Explosion limits (air):	
Upper:	not available
Lower:	50 g/m ³ (dust)
Evaporation rate:	not applicable
Relative density: (20°C):	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
Solubility (in Water):	insoluble
pH value: (ASTM 1512):	4-11 [50 g/l water, 68°F (20°C)]
Partition coefficient (n-octanol/water):	not applicable
Viscosity:	not applicable
Decomposition temperature:	not applicable
Auto-ignition temperature:	>140°C (transport) IMDG-Code
Minimum Ignition temperature:	>500°C (BAM Furnace) (VDI 2263) >315°C (Godberg-Greenwald Furnace) (VDI 2263)
Minimum ignition energy:	>10,000 mJ (VDI 2263)
Maximum absolute explosion pressure:	10 bar (VDI 2263)
Maximum rate of pressure rise:	30-400 bar/sec (VDI 2263 and ASTM E1226-88)
Burn Velocity:	> 45 seconds (not classified as "highly flammable" or "easily ignitable")
Kst Value:	not available

Safety Data Sheet

Prepared in accordance with the United States Hazard Communication Standard: 29 CFR 1910.1200 (2012),
Canada's Workplace Hazardous Materials Information System (SOR/2015-17), and
Mexico's NORMA MEXICANA NOM-018-STPS-2015

Dust explosion classification: ST1
Decomposition temperature: not applicable

9.2. Other information:

Not available

SECTION 10: Stability and reactivity

10.1. Reactivity:

Reactivity: May react exothermically upon contact with strong oxidizers.

10.2. Chemical stability:

Stability: Stable under normal ambient conditions.

Explosion data:

Sensitivity to mechanical impact: Not sensitive to mechanical impact

Sensitivity to static discharge: Dust may form explosible mixture in air. Avoid dust formation. Do not create a dust cloud. Take precautionary measures against static discharges. Ensure all equipment is earthed/grounded before beginning transfer operation.

10.3. Possibility of hazardous reactions:

Hazardous polymerization: Does not occur.

Possibility of hazardous reactions: None under normal conditions.

10.4. Conditions to avoid

Conditions to avoid: Avoid high temperatures >400°C (>752°F) and sources of ignition. Avoid generation of dust.

10.5. Incompatible materials

Incompatible materials: Strong oxidizers.

10.6. Hazardous decomposition products:

Hazardous decomposition products: Carbon monoxide, carbon dioxide, organic products of combustion, oxides of sulfur.

SECTION 11: Toxicological information

11.1. Information on toxicological effects:

Acute Toxicity:

Oral LD50: LD₅₀ (rat) > 8000 mg/kg. (Equivalent to OECD TG 401)

Inhalation LD50: No data available

Safety Data Sheet

Prepared in accordance with the United States Hazard Communication Standard: 29 CFR 1910.1200 (2012),
Canada's Workplace Hazardous Materials Information System (SOR/2015-17), and
Mexico's NORMA MEXICANA NOM-018-STPS-2015

Dermal LD50: No data available

Skin corrosion/irritation:

Rabbit: not irritating. (Equivalent to OECD TG 404)

Edema = 0 (max. attainable irritation score: 4)

Erythema = 0 (max. attainable irritation score: 4)

Assessment: Not irritating to skin.

Serious eye damage/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.

Safety Data Sheet

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Canada's Workplace Hazardous Materials Information System (SOR/2015-17), and
Mexico's NORMA MEXICANA NOM-018-STPS-2015

Carcinogenicity:	<u>Animal toxicity-</u>	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.

Safety Data Sheet

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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 Labelling 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.

Safety Data Sheet

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Mexico's NORMA MEXICANA NOM-018-STPS-2015

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/m³ (respirable).
Target organ/effects at higher doses are lung inflammation, hyperplasia, and fibrosis.

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

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

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

Morbidity studies (human data):

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

In the U.S. study, 9% of the highest non-smokers exposure group (in contrast to 5% of the unexposed group) reported symptoms consistent with chronic bronchitis. In the European study, methodological limitations in the administration of the questionnaire limit the conclusions that can be drawn about reported symptoms. This study, however, indicated a link between carbon black and small opacities on chest films, with negligible effects on lung function.

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

Safety Data Sheet

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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.

SECTION 12: Ecological information

12.1. 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) \geq 800 mg/l, Method: DEV L3 (TTC test)

12.2. Persistence and degradability

Not soluble in water. The methods for determining biodegradability are not applicable to inorganic substances.

12.3. Bio-accumulative potential

Not expected because of the physicochemical properties of the substance.

12.4. Mobility in soil

Not expected to migrate. Insoluble.

12.5. Other adverse effects

Not available.



Safety Data Sheet

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SECTION 13: Disposal considerations

13.1. Product Disposal:

Product should be disposed of in accordance with the regulations issued by the appropriate federal, provincial, state, and local authorities.

Canada: Not a hazardous waste under provincial regulations

USA: Not a hazardous waste under U.S. RCRA, 40 CFR 261.

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

SECTION 14: Transport 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.

The following organizations do not classify carbon black as a "hazardous cargo" if it is "carbon, non-activated, mineral origin." Himadri Speciality Chemical Ltd's carbon black products meet this definition.

DOT, TDG, MEX, IMDG, RID, ADR, ICAO (air), IATA, ADN

14.1. UN/ID No Not regulated

14.2. Proper shipping name Not regulated

14.3. Hazard class Not regulated

14.4. Packing group Not regulated

SECTION 15: Regulatory information

15.1. Hazard Classification:

USA: OSHA (29 CFR 1910.1200): Hazardous

Mexico: NOM-018-STPS-2015: Hazardous

Canada: WHMIS 2015: Hazardous

Safety Data Sheet

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Mexico's NORMA MEXICANA NOM-018-STPS-2015

International Inventories

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

Australia:	AIIC
Canada:	DSL
China:	IECSC
Europe (EU):	EINECS (EINECS-RN: 215-609-9)
Japan:	ENCS
Korea:	KECI
Philippines:	PICCS
Taiwan:	TCSI
New Zealand:	NZIoC
USA:	TSCA, Active

United States:

Food and Drug Administration: 21 CFR 177.2600 - for food contact when used as a filler in rubber articles intended for repeated use

LIMITATIONS:

- Total carbon black (channel process and furnace process) in the rubber may not exceed 50% by weight of the rubber products
- Furnace combustion black content not to exceed 10% by weight of rubber products intended for use in contact with milk or edible oils. KOHLENSTOFF® ONYX 300F is a furnace combustion black.
- Not for use in contact with infant formula and human milk (see TOR 2016-002)

Food and Drug Administration: 21 CFR 178.3297(e) - for use as a colorant for polymers

LIMITATION:

- For use at levels not to exceed 2.5 percent by weight of the polymer

SARA 313 (TRI): Carbon black is not a SARA 313 chemical.

The reporting threshold for 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 25 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.)

SARA 311/312: applies if carbon black is present at any one time in amounts equal to or greater than 10,000 pounds. Under Section 311/312, SDS requirements, carbon



Safety Data Sheet

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Canada's Workplace Hazardous Materials Information System (SOR/2015-17), and
Mexico's NORMA MEXICANA NOM-018-STPS-2015

black is determined to be hazardous according to the following EPA hazard category:
Combustible Dust

Clean Air Act Amendments of 1990 (CAA, Section 112, 40 CFR 82) – This product does not contain any components listed as a Hazardous Air Pollutant, Flammable Substance, Toxic Substance, or Class 1 or 2 Ozone Depletor.

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

Comprehensive Environmental Response Compensation and Liability Act (CERCLA) – This product, as supplied, does not contain any substances regulated as hazardous under CERCLA (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA, 40 CFR 355). Local, regional, and/or state regulations should be consulted to determine if specific reporting requirements exist for the release of this substance.

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.

U.S. State Right to Know Regulations:

New Jersey: Carbon Black, CAS# 1333-86-4

Massachusetts: Carbon Black, CAS# 1333-86-4

Pennsylvania: Carbon Black, CAS# 1333-86-4

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 SDS contains all the information required by the Controlled Products Regulations."

Ingredients Disclosure List: Contains carbon black. See Section 2

Greenhouse Gas Reporting: Not subject to mandatory reporting

Safety Data Sheet

Prepared in accordance with the United States Hazard Communication Standard: 29 CFR 1910.1200 (2012),
Canada's Workplace Hazardous Materials Information System (SOR/2015-17), and
Mexico's NORMA MEXICANA NOM-018-STPS-2015

SECTION 16: Other Information

Contact Information:

Supplier:	HIMADRI SPECIALITY CHEMICAL LTD
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Telephone:	+ 91-33 2230 4363 , + 91-33 2230 9953
Factory:	Mahistikry, Haripal, Hooghly – 712223, West Bengal, India

References:

Borm, P.J.A., Cakmak, G., Jermann, E., Weishaupt C., Kempers, P., van Schooten, F.J., Oberdorster, G., Schins, R.P. (2005) Formation of PAH-DNA adducts after in-vivo and vitro exposure of rats and lung cell to different commercial carbon blacks. *Tox.Appl. Pharm.* 1:205(2):157-67.

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

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

Driscoll KE, Deyo LC, Carter JM, Howard BW, Hassenbein DG and Bertram TA (1997) Effects of particle exposure and particle-elicited inflammatory cells on mutation in rat alveolar epithelial cells. *Carcinogenesis* 18(2) 423-430. Gardiner K, van Tongeren M, Harrington M. (2001) Respiratory health effects from exposure to carbon black: Results of the phase 2 and 3 cross sectional studies in the European carbon black manufacturing industry. *Occup. Env. Med.* 58: 496-503.

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

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

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

Morfeld P, Büchte SF, Wellmann J, McCunney RJ, Piekarski C (2006). Lung cancer mortality and carbon black exposure: Cox regression analysis of a cohort from a German carbon black production plant. *J. Occup.Env.Med.*48(12):1230-1241.

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



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

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

Revision Note: N/A

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.

End of SDS