

**Material Safety Data Sheet
Carbon Black**

Revision date: February 7, 2007

Section 1**IDENTIFICATION OF SUBSTANCE AND COMPANY**

1.1 Product name: Carbon Black

Trade Names: Thermax N-990, N-907 Stainless, N-990 Ultra-Pure Floform, Thermax N-991, N-991 Ultra-Pure, N-908 Stainless, N-908 Stainless Ultra-Pure Powder, Fine Thermal, MFT, CarboColor, CarboColor Powder, N991R, Colorant Residue, TB Carbon.

1.2 Manufacturer/supplier: Cancarb Limited
1702 Brier Pk. Cr. NW.
Medicine Hat, Alberta
Canada, T1C 1T8
Phone number: 403-527-1121 24-hours

1.3 Emergency number(s)

For Chemical Emergency ONLY (spill, leak, fire, exposure or accident), call CHEMTREC at 800-424-9300 (703-527-3887 out side the US)."

For ALL other inquiries about this product, call 403-527-1121

1.4 Use of substance/preparation

Used as a filler in rubber and plastics, carburizer and reducing agent in metallurgy and refractory additive

Section 2

HAZARDS IDENTIFICATION**2.1 Emergency overview**

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

2.2 OSHA Regulatory Status

This material is classified as hazardous under OSHA regulations

EU Regulatory Status:

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

WHMIS Regulatory Status:

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

2.3 Potential Health Effects

Routes of Exposure:

Inhalation, eye, skin

Note: ingestion of carbon black is not considered a likely route of exposure.

Acute Effects

Acute Inhalation: Temporary discomfort to upper respiratory tract may occur due to mechanical irritation when exposures are well above the occupational exposure limit.

Acute Ingestion: No evidence of adverse effects from available data.

Acute eye: High dust concentrations may cause mechanical irritation to eye.

Acute skin: May cause mechanical irritation, soiling, and skin drying.

Sensitization: No cases of sensitization in humans have been reported.

Chronic Effects

Long-term exposure below the current occupational exposure limit of 3.5 mg/m³ (when measured as traditional 'total' dust) may result in a small

loss in one aspect of lung function (FEV₁) over a working life-time.

IARC listed: *Group 2B (possibly carcinogenic to humans)*. Not listed as a carcinogen by NTP, ACGIH, OSHA, or the European Union.

There are no known human carcinogenic effects related to the PAH content of carbon blacks. Recent research has shown that the PAH content of carbon blacks is not released in biological fluids and thus not available for biological activity.

Medical Conditions Aggravated:

Respiratory disorders, asthma.

2.4 Potential Environmental Effects

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

Section 3

COMPOSITION/INFORMATION ON INGREDIENTS

Component(s)

Carbon Black, amorphous (99% by weight)

Chemical formula: C

CAS number: 1333-86-4

EINECS number: 215-609-9

EU Classification: Not Classified

Section 4

FIRST AID MEASURES

4.1 First aid procedures

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

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

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

Ingestion: Do not induce vomiting. If conscious, give several glasses of

water. Never give anything by mouth to an unconscious person.

- 4.2 **Note to physicians:** Treat symptomatically.

Section 5

Fire Fighting Measures

5.1 Flammable properties

It may not be obvious that carbon black is burning unless the material is stirred and sparks are apparent. Carbon black that has been on fire should be observed closely for at least 48 hours to ensure no smoldering material is present.

Carbon blacks containing more than 8% volatile materials may form an explosive dust-air mixture. Manufactured carbon blacks do not exceed 8% volatile materials content (unless otherwise noted by the supplier). See Section 9, Chemical and Physical Properties.

5.2 Extinguishing media

5.2.1 Suitable extinguishing media

Use foam, carbon dioxide (CO₂), dry chemical, nitrogen (N₂), or water fog. A fog spray is recommended if water is used.

5.2.2 Unsuitable extinguishing media

DO NOT USE high pressure water stream as this may spread burning powder (burning powder will float and may spread fire).

5.3 Protection of firefighters

Wear full protective fire fighting gear (Bunker gear) including self-contained breathing apparatus (SCBA).

5.3.1 Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products)

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

5.3.2 Protective equipment and precautions for firefighters

Wet carbon black produces very slippery walking surfaces.

Section 6

Accidental Release Measures

6.1 **Personal precautions**

Wear appropriate personal protective equipment and respiratory protection.

Note: Wet carbon black produces very slippery walking surfaces. See Section 8.

6.2 **Environmental precautions**

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

6.3 **Methods for containment**

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, Part 63).

6.4 **Methods for clean-up**

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

6.5 **Other information**

[This may contain specific reporting requirements for spills, leaks, or releases (but may also be referenced in Section 15, Regulatory).]

Section 7

Handling and Storage

7.1 Handling

Avoid dust exposures above the occupational exposure limit
Use local exhaust ventilation or other appropriate engineering controls to maintain exposures below occupational exposure limit. Avoid contact with skin and eyes. If exposed, wash to avoid mechanical irritation and soiling.

Dust may cause electrical shorts if capable of penetrating electrical equipment. Ensure equipment is tightly sealed.

If hot work (welding, torch cutting, etc.) is required the immediate work area must be cleared of carbon black product and dust.

Some grades of carbon black are sufficiently electrically non-conductive and may allow a build-up of static charge during handling. Take measures to prevent the build up of electrostatic charge, such as ensuring all equipment is electrically grounded/earthed.

7.2 Storage

Store in a dry place away from ignition sources and strong oxidizers.

Before entering closed vessels and confined spaces containing carbon black test for adequate oxygen, flammable gases and potential toxic air contaminants (e.g., CO). Follow standard safe practices when entering confined spaces.

Section 8
Exposure Control/Personal Protection

8.1 **Exposure guidelines**

Country	Occupational Exposure Limit, mg/m ³
Australia	3.0 TWA
Canada	3.5 TWA
France	3.5 TWA
Germany - MAK TRGS 900	1.5 TWA (respirable) ^A 4.0 TWA (inhalable) ^A 3.0 TWA (respirable) ^B 6.0 TWA (respirable) ^C 10.0 TWA (inhalable) ^D
Italy	3.5 TWA
Korea	3.5 TWA
Spain	3.5 TWA
United Kingdom – OES STEL	3.5 TWA (inhalable) 7.0, 10 minutes (inhalable)
United States - OSHA-PEL ACGIH-TLV NIOSH -REL	3.5 TWA 3.5 TWA 3.5 TWA (see Section 11)

TWA = 8-hour time-weighted-average, except as noted. MAK = Maximale Arbeitsplatz-Konzentration (maximum workplace concentration) (advisory). TRGS = Technische Regeln für Gefahrstoffe (regulatory limits). OES = occupational exposure standard. STEL = short-term exposure limit. OSHA-PEL = Occupational Safety and Health Administration - Permissible Exposure Limit. ACGIH-TLV = American Conference of Governmental Industrial Hygienists-Threshold Limit Value. NIOSH-REL = National Institute of Occupational Safety and Health - Recommended Exposure Limit.
^A annual average. ^B applies to all activities except those exempted, consult regulatory agency.
^C applies to certain exempt industries, consult regulatory authority. ^D effective April 2004, consult regulatory agency.

8.2 **Engineering controls**

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

8.3 **Personal protective equipment (PPE)**

8.3.1 **Eye/face protection**

Safety glasses or goggles recommended as a matter of good practice

8.3.2 **Skin protection**

Wear general protective clothing to minimize skin contact. Work clothes should not be taken home and should be washed daily.

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

8.3.3 Respiratory protection

Approved air purifying respirator (APR) for particulates 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. Use of respirators must include a complete respiratory protection program in accordance with national standards and current best practices.

8.3.4 General hygiene considerations

Emergency eyewash and safety shower should be in close proximity as a matter of good practice. Wash hands and face thoroughly with mild soap before eating and drinking.

Section 9

Physical and Chemical Properties

Appearance:	powder or pellet
Color:	black
Odor	odorless
Odor threshold:	not applicable
Melting point/range	not applicable
Boiling point/range	not applicable
Vapor pressure	not applicable
Evaporation rate	not applicable
Density: (20°C)	1.7 – 1.9 g/ml
Bulk density:	1.25-40 lb/ft ³ , 20-640 kg/m ³
Pellets	200-680 kg/m ³
Powder (fluffy)	20-380 kg/m ³
Solubility (in Water):	insoluble
pH value: (ASTM 1512)	4-11 [50 g/l water, 68°F (20°C)]
Partition coefficient (n-octanol/water):	not applicable
Viscosity:	not applicable
Decomposition temperature:	572°F (300°C)

Section 10**Stability and Reactivity**10.1 **Chemical stability**

Stable under normal ambient conditions.

10.2 **Conditions to avoid**

Prevent exposure to high temperatures and open flames.

10.3 **INCOMPATIBLE MATERIALS**

STRONG OXIDIZERS SUCH AS CHLORATES, BROMATES, AND NITRATES.

10.4 **Hazardous decomposition products**

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

10.5 **Possibility of hazardous reaction**

Will not occur.

Section 11**Toxicological Information**

Acute toxicity:

Acute oral toxicity: LD₅₀ (rat), > 8000 mg/kg

Primary skin irritation:

rabbit: non-irritative, index score 0.6/8 (4.0 = severe edema)

Primary eye irritation

rabbit: non-irritative, Draize score 10-17/110
(100 = maximally irritating)

Subchronic toxicity:

Rat, inhalation, duration 90 days, NOAEL = 1.0 mg/m³ (respirable)
Target organ: lungs; inflammation, hyperplasia, fibrosis

Chronic toxicity:

Rat, oral, duration 2 years
Effect: no tumors

Mouse, oral, duration 2 years
Effect: no tumors

Mouse, dermal, duration 18 months
Effect: no skin tumors

Rat, inhalation, duration 2 years
Target organ: lungs.
Effect: inflammation, fibrosis, tumors

Note: Tumors in the rat lung are considered to be related to the “particle overload phenomenon” 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. 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.

Carcinogenicity

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

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.

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)*.

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

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

The U.S. National Institute of Occupational Safety and Health (NIOSH) 1978 criteria document on carbon black recommends that only carbon blacks with PAH contaminant levels greater than 0.1% require the measurement of PAHs in air. As some PAHs are possible human carcinogens, NIOSH recommends an exposure limit of 0.1 mg/m³ for PAHs in air, measured as the cyclohexane-extractable fraction.

Sensitization

No animal data available.

Mutagenic effects

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 oxygen species. (see Chronic toxicity above). This is thus considered to be a secondary genotoxic effect and thus carbon black itself would not be considered to be mutagenic.

Reproductive effects

No effects have been reported in long-term animal studies.

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 of carbon black workers in the UK showed an elevated incidence of lung cancer but it was not considered to be related to carbon black exposure. A study of workers at a large German carbon black manufacturing facility found increased lung cancer mortality among German carbon black workers, but found no apparent dose-response relationship between lung cancer mortality and several indicators of occupational exposure, including years of employment and carbon black exposure. The study concluded that the high lung cancer mortality could not be fully explained by selection, smoking, or other occupational risk factors, but the results also provided little evidence for an effect from carbon black exposure. A recent mortality study of US carbon black workers found no association between employment in carbon black production and lung cancer or any other type of cancer.

Section 12

Ecological Information

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:
EC 50 (72 h) >10,000 mg/l
NOEC 50 ≥10,000 mg/l
Species: *Scenedesmus subspicatus*,
Method: OECD Guideline 201

Activated sludge:
EC₀ (3 h) >= 800 mg/l.
Method: DEV L3 (TTC test)

Environmental fate:

Mobility

Not soluble in water. Not expected to migrate.

Known or predicted distribution

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

Bioaccumulation Potential:

Bioaccumulation is not expected due to physicochemical properties of the substance.

Section 13**Disposal Considerations**

Product can be burned in suitable incineration plants or disposed of in a suitable landfill in accordance with the regulations issued by the appropriate federal, provincial, state and local authorities.

EU: EU Waste Code No. 61303 per Council Directive 75/422/EEC

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

Canada: Not a hazardous waste under provincial regulations.

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

Section 14**Transport Information**

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

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

U.S. Department of Transportation (DOT) Hazardous Materials Regulations,
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”

Section 15

Regulatory Information

European Union – Label Information

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

Symbol – none required.

Germany – water classification

WGK Number (Kenn-Nr): 1742

WGK Class (Wassergefährdungsklasse): nwg (non-hazardous to waters)

Canada

Worker Hazardous Material Information System (WHMIS), Classification D2A.

Statement of Equivalence

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

Ingredients Disclosure List

Contains carbon black. See Section 2.

United States

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

Superfund Amendments and Reauthorization Act (SARA) Title III
Section 313 Toxic Substances: Does not contain any components subject to this section.

OSHA, Hazard Communication Standard, 29 CFR 1910.1200

Toxic Release Inventory (TRI)

Under EPA's Toxics Release Inventory (TRI) program the reporting threshold for 21 Polycyclic Aromatic Compounds (PACs) has been lowered to 100 pounds per year manufactured, processed, or otherwise used. (64 CFR 58666, Oct. 29, 1999) The 100 pounds/yr applies to the cumulative total of 21 specific PACs. Carbon black may contain certain of these PACs and the user is advised to evaluate their own TRI reporting responsibilities.

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.

Inventory Status

All components either are listed on or exempt from the following inventories:

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

Australia: AICS (Australian Inventory of Chemical Substances)

Canada: CEPA (Canadian Environmental Protection Act), domestic substance list (DSL).

China: Inventory of Existing Chemical Substances

Japan: MITI (Ministry of International Trade and Industry) List of Existing Chemicals Substances. 10-3074/5-3328 and 10-3073/5-5222 (Section-Structure No./Class Reference No.)

Korea: TCC-ECL (Toxic Chemical Control Law Existing Chemical List) KE-04682

United States: SARA (Super Fund Amendments and Reauthorization Act), Sections 311/312 apply if carbon black is present at any one time in amounts equal to or greater than 10,000 pounds. Under Section 311/312 – MSDS requirements, carbon black is determined to be hazardous according to the following EPA hazard categories:

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

Reactive hazard: No

Section 16
Other Information

Manufactured carbon blacks generally contain less than 0.1% of solvent extractable polycyclic aromatic hydrocarbons (PAH). Solvent extractable PAH content depends on numerous factors including, but not limited to, the manufacturing process, desired product specifications, and the analytical procedure used to measure and identify solvent extractable materials.

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

National Fire Protection Association (NFPA) Rating:

Health:	0
Flammability:	1
Reactivity:	0

0 = minimal, 1 = slight, 2 = moderate, 3 = serious, 4 = severe

Hazardous Materials Identification System[®] (HMIS[®]) Rating:

Health:	1* (*designates chronic hazard)
Flammability:	1
Physical Hazard:	0

0 = minimal, 1 = slight, 2 = moderate, 3 = serious, 4 = severe

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

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Miscellaneous: WHMIS Label Symbol appropriate to carbon black.



[The WHMIS symbol is only one element of many required to meet the labeling requirements. See regulation.] Disclaimer

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 safety and health 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 MSDS is updated on a periodic basis in accordance with applicable health and safety standards.
