RAVEN 410 Carbon Black

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

1.1. Product identifier

RAVEN 410 Carbon Black

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

Use of the substance/mixture

test dust

1.3. Details of the supplier of the safety data sheet

Manufacturer

Company name: Powder Technology Inc.
Street: 1300 Grey Fox Road
Place: USA-55112 Arden Hills, MN
Telephone: +1 952 894 -8737
e-mail: sales@powdertechnologyinc.com
Internet: http://www.powdertechnologyinc.com

Supplier

Company name: fiatec Filter & Aerosol Technologie GmbH
Street: Burgkunstadter Straße 3
Place: D-95336 Mainleus
Telephone: + 49 9229 99 39 - 0
Telexfax: +49 9229 99 39 -10
e-mail: info@fiatec.com
Contact person: M.Eber
Telephone: -24
e-mail: matthias.eber@fiatec.com
Internet: www.fiatec.com
Responsible Department: Managing Director

1.4. Emergency telephone number:

Poison Information Centre Berlin: +(49) 30 19240

Further Information

This safety data sheet was created by: ECI EnviroConsult Ingenieurbüro Dr. Lux e.K.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Directive 67/548/EEC or 1999/45/EC

This substance is not classified as hazardous according to Directive 67/548/EEC.

2.2. Label elements

Signal word: Warning
Pictograms: GHS07

Hazard statements

H332 Harmful if inhaled.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 Call a POISON CENTER/doctor if you feel unwell.

2.3. Other hazards
No information available.

SECTION 3: Composition/information on ingredients

3.1. Substances
Chemical characterization
carbon black with <0.1 wt% PAH

Hazardous components

<table>
<thead>
<tr>
<th>EC No</th>
<th>Chemical name</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS No</td>
<td>Classification according to Directive 67/548/EEC</td>
<td></td>
</tr>
<tr>
<td>Index No</td>
<td>Classification according to Regulation (EC) No 1272/2008 [CLP]</td>
<td></td>
</tr>
<tr>
<td>215-609-9</td>
<td>Carbon Black</td>
<td>100 %</td>
</tr>
<tr>
<td>1333-86-4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Full text of R, H and EUH phrases: see section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

After inhalation
Provide fresh air. If breathing is irregular or stopped, administer artificial respiration.

After contact with skin
After contact with skin, wash immediately with: Water and soap. In case of skin irritation, seek medical treatment.

After contact with eyes
Rinse immediately carefully and thoroughly with eye-bath or water. In case of eye irritation consult an ophthalmologist.

After ingestion
Rinse mouth immediately and drink plenty of water.

4.2. Most important symptoms and effects, both acute and delayed
No information available.

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

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
Foam Carbon dioxide (CO2) Extinguishing powder. Water fog.

Unsuitable extinguishing media
High power water jet. High power water jet.

5.2. Special hazards arising from the substance or mixture
In case of fire may be liberated: Carbon monoxide. Carbon dioxide (CO2). Sulfur oxides.
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 48h to ensure no smoldering material is present.

5.3. Advice for firefighters
In case of fire: Wear self-contained breathing apparatus. Use caution when applying carbon dioxide in confined spaces. Carbon dioxide can displace oxygen.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Avoid generation of dust. Do not breathe dust. Special danger of slipping by leaking/spilling product.

6.2. Environmental precautions
No special environmental measures are necessary. Clean contaminated objects and areas thoroughly observing environmental regulations.

6.3. Methods and material for containment and cleaning up
Take up mechanically. Treat the recovered material as prescribed in the section on waste disposal.

6.4. Reference to other sections
Safe handling: see section 7
Personal protection equipment: see section 8
Disposal: see section 13

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling
Avoid generation of dust. Do not breathe dust. All work processes must always be designed so that the following is as low as possible: inhalation.

Advice on protection against fire and explosion
Avoid generation of dust. Keep away from sources of ignition. - No smoking. Fine dust may cause electrical shorts and is capable of penetrating electrical equipment unless tightly sealed.

7.2. Conditions for safe storage, including any incompatibilities
Requirements for storage rooms and vessels
Keep container tightly closed. Handle and open container with care. Keep container dry. Conditions to avoid: Dust deposits.

Advice on storage compatibility
Materials to avoid: Oxidizing agents, strong.

7.3. Specific end use(s)
test dust

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
DNEL/DMEL values

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Substance</th>
<th>Exposure route</th>
<th>Effect</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1333-86-4</td>
<td>Carbon Black</td>
<td></td>
<td>systemic</td>
<td>2 mg/m³</td>
</tr>
</tbody>
</table>

Additional advice on limit values
Germany: MAK: 1.0 mg/m³ TWA (respirable), 4.0 mg/m³ TWA (inhalable)

8.2. Exposure controls
Protective and hygiene measures
Take off contaminated clothing. Wash hands before breaks and after work. When using do not eat or drink.

Eye/face protection
Wear eye/face protection. Suitable eye protection: Tightly sealed safety glasses.

Hand protection
When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

Skin protection
Wear suitable protective clothing.

Respiratory protection
In case of inadequate ventilation wear respiratory protection. Suitable respiratory protective equipment: particulates filter device (DIN EN 143).

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>solid</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>black</td>
<td></td>
</tr>
<tr>
<td>Odour</td>
<td>odourless</td>
<td></td>
</tr>
<tr>
<td>pH-Value</td>
<td>not determined</td>
<td></td>
</tr>
<tr>
<td>Melting point</td>
<td>not determined</td>
<td></td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>not determined</td>
<td></td>
</tr>
<tr>
<td>Flash point</td>
<td>not applicable</td>
<td></td>
</tr>
<tr>
<td>Flammability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid</td>
<td>not determined</td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>not applicable</td>
<td></td>
</tr>
<tr>
<td>Lower explosion limits</td>
<td>60 g/m³</td>
<td></td>
</tr>
<tr>
<td>Upper explosion limits</td>
<td>not determined</td>
<td></td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid</td>
<td>&gt;140 °C</td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>not applicable</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>300 °C</td>
<td></td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>Not oxidizing</td>
<td></td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>not determined</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>1.9 g/cm³</td>
<td></td>
</tr>
<tr>
<td>Water solubility</td>
<td>insoluble</td>
<td></td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>not determined</td>
<td></td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>not determined</td>
<td></td>
</tr>
<tr>
<td>Vapour density</td>
<td>not determined</td>
<td></td>
</tr>
</tbody>
</table>
RAVEN 410 Carbon Black

Evaporation rate: not determined

9.2. Other information

Solid content: 100,00 %

SECTION 10: Stability and reactivity

10.1. Reactivity

No hazardous reaction when handled and stored according to provisions.

10.2. Chemical stability

The product is stable under storage at normal ambient temperatures.

10.3. Possibility of hazardous reactions

No information available.

10.4. Conditions to avoid

none

10.5. Incompatible materials

Oxidizing agents.

10.6. Hazardous decomposition products


SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Exposure route</th>
<th>Method</th>
<th>Dose</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1333-86-4</td>
<td>Carbon Black</td>
<td>oral</td>
<td>LD50</td>
<td>8000 mg/kg</td>
<td>Rat</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>inhalative (4 h) aerosol</td>
<td>LC50</td>
<td>&gt;4,46 mg/l</td>
<td>Rat</td>
<td>ECHA</td>
</tr>
</tbody>
</table>

Carcinogenic/mutagenic/toxic effects for reproduction
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.

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.

Further information

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.

SECTION 12: Ecological information

12.1. Toxicity

The product is not: Ecotoxic.

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Aquatic toxicity</th>
<th>Method</th>
<th>Dose [h]</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>1333-86-4</td>
<td>Carbon Black</td>
<td>Acute fish toxicity</td>
<td>LC50</td>
<td>&gt;10000 mg/l</td>
<td>96 h Brachydanio rerio (zebra-fish)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acute crustacea toxicity</td>
<td>EC50</td>
<td>&gt;5600 mg/l</td>
<td>48 h Daphnia magna (Big water flea)</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

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

12.3. Bioaccumulative potential

The product has not been tested.
RAVEN 410 Carbon Black

12.4. Mobility in soil
The product has not been tested.

12.5. Results of PBT and vPvB assessment
The product has not been tested.

12.6. Other adverse effects
No information available.

Further information
Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Advice on disposal
Dispose of waste according to applicable legislation.

Contaminated packaging
Wash with plenty of water. Completely emptied packages can be recycled.

SECTION 14: Transport information

Land transport (ADR/RID)

14.1. UN number: No dangerous good in sense of this transport regulation.
14.2. UN proper shipping name: No dangerous good in sense of this transport regulation.
14.3. Transport hazard class(es): No dangerous good in sense of this transport regulation.
14.4. Packing group: No dangerous good in sense of this transport regulation.
14.5. Environmental hazards
ENVIRONMENTALLY HAZARDOUS: no

14.6. Special precautions for user
No information available.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code
not applicable

SECTION 15: Regulatory information

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

National regulatory information
Employment restrictions:
Observe restrictions to employment for juvenils according to the ‘juvenile work protection guideline’ (94/33/EC).
Water contaminating class (D):
- - not water contaminating

15.2. Chemical safety assessment
For this substance a chemical safety assessment has not been carried out.

SECTION 16: Other information

Abbreviations and acronyms
ADR: Accord européen sur le transport des marchandises dangereuses par Route
(European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
RAVEN 410 Carbon Black

ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service
LC50: Lethal concentration, 50%
LD50: Lethal dose, 50%

Relevant H and EUH statements (number and full text)
H332 Harmful if inhaled.

Further Information
The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.