TRADE NAME
Recycled Carbon Fiber

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

1.1 Product identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>Recycled Carbon Fiber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>n/a</td>
</tr>
<tr>
<td>Chemical family</td>
<td>carbon fiber</td>
</tr>
<tr>
<td>Product description</td>
<td>continuous, chopped or milled carbon fiber</td>
</tr>
</tbody>
</table>

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

1.2.1 Relevant uses

- industrial applications

1.2.2 Uses advised against

- none known

1.3 Details of the supplier of the safety data sheet

<table>
<thead>
<tr>
<th>Company</th>
<th>Zoltek Companies, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3101 Mckelvey Road</td>
</tr>
<tr>
<td></td>
<td>St. Louis, MO 63044</td>
</tr>
<tr>
<td></td>
<td>USA</td>
</tr>
<tr>
<td></td>
<td>(314) 291-5110</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.zoltek.com">www.zoltek.com</a></td>
</tr>
</tbody>
</table>

| E-mail enquiry              | sds@zoltek.com          |

1.4 Emergency telephone number

+1 (314) 291-5110 8AM-5PM / M-F
SECTION 2: Hazards Identification

2.1 Classification of the substance or mixture

Product definition article

2.1.1 Classification according to Regulation (EC) No 1272/2008 [CLP]

not classified

2.1.2 Classification according to Regulation 67/548/EEC or 1999/45/EC

<table>
<thead>
<tr>
<th>Hazard symbols</th>
<th>none</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-phares</td>
<td>none</td>
</tr>
</tbody>
</table>

The product does not require a hazard warning label, in accordance with OSHA HazCom and EC-directives

2.2 Label elements

Labeling according to Regulation 67/548/EEC or 1994/45/EC

<table>
<thead>
<tr>
<th>Hazard symbols</th>
<th>none</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-phares</td>
<td>none</td>
</tr>
<tr>
<td>S-phares</td>
<td>none</td>
</tr>
<tr>
<td>Special labeling</td>
<td>not applicable</td>
</tr>
</tbody>
</table>

2.3 Other hazards

Physio-chemical hazards see SECTION 10

In the supplied form the product itself is not explosive at all; however, the build-up of fines and dust can lead to a risk of dust explosions.

Human health dangers see SECTION 11 and below

Eye Dust may cause temporary irritation.

Skin Dust may cause mild irritation. In some cases, the dust may cause allergic skin reactions.

Inhalation Dust may cause mild irritation.

Environmental hazards see SECTION 12

Other hazards This product and its dusts are electrically conductive
SECTION 3: Composition/information on ingredients

3.1 Product-type article

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS. NO</th>
<th>EINECS/ELINCS</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon fiber, (carbon) polyacrylonitrile (PAN)-based</td>
<td>308063-67-4 (7440-44-0)</td>
<td>Polymer: 231-153-3</td>
<td>91.0-99.8</td>
</tr>
<tr>
<td>Sizing</td>
<td>proprietary</td>
<td>0.0-9.0%</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1 Description of first aid measures

General information not applicable

Inhalation Remove from the area of the dust to fresh air. Seek medical attention if you feel unwell.

Skin contact Wash affected areas thoroughly with soap and water.

Eye contact Flush eyes with water for 15 minutes.

Ingestion In the event of deliberate ingestion, do not induce vomiting unless directed to do so by consulting with a doctor.

4.2 Most important symptoms and effects, both acute and displayed

no data available

4.3 Indication of any immediate medical attention and special treatment

no data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media normal firefighting media and procedures

Unsuitable extinguishing media dependent on processing plant conditions

5.2 Special hazards arising from the substance or media

airborne fibers are electrically conductive CO₂, CO and a minute amount of N₂, HCN and H₂O
5.3 Advice for firefighters

self-contained breathing apparatus (SCBA)

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel
not applicable

6.1.2 For emergency responders
not applicable

6.2 Environmental precautions
not applicable

6.3 Methods and material for containment and cleaning up

6.3.1 For containment
In case of spill, collect the spilled materials. If the material is not contaminated, put it into a clean container and it can be reused. Otherwise, dispose of it properly.

6.3.2 For cleaning up
Because the dust is electrically conductive and may become airborne, clean up with a vacuum. If an electrical appliance is used, take the steps necessary to avoid the risk of electrical shock.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
No special measures necessary if used properly.

7.2 Conditions for safe storage, including any incompatibilities
Airborne particles and filaments should be controlled so as to minimize skin irritation and electrical shorts in switch gears, etc. due to conductivity of fiber.

Do not store together with oxidizing agents

7.3 Specific end use(s)
see section 1.2

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits
OSHA and ACGIH (USA) have not established air contamination for carbon fibers. Under certain conditions this substance may be a nuisance dust. OSHA has an established standard for particulates not otherwise regulated (nuisance dust) set at 5 mg/m$^3$ (respirable fraction) and 15 mg/m$^3$ (total dust). ACGIH has established an exposure value of 3 mg/m$^3$ (respirable fraction) and 10 mg/m$^3$ (total).

NHFPC (PRC) has an established standard for carbon fiber's particulates not otherwise regulated set at 6mg/m$^3$ ESTL (total dust) and 3mg/m$^3$ TWA (total dust),
Belgium has established an Occupational Exposure Limit for carbon fiber as 2 fiber/cm³ TWA.

8.2 Exposure controls

8.2.1 Appropriate engineering controls  local exhaust for airborne fiber removal.

8.2.2 Personal protection equipment

8.2.2.1 Eye and face protection  safety glasses

8.2.2.2 Skin protection

   Hand protection  protective gloves

   Other skin protection  Recommend disposable protective garments to eliminate possible skin irritation.

8.2.2.3 Respiratory protection  Personal dust respirators applicable if high degree of fiber fly is experienced.

8.2.2.4 Thermal hazards  not applicable

8.2.3 Environmental exposure controls  see SECTION 6 & 7

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>black fiber</td>
</tr>
<tr>
<td>Odor</td>
<td>odorless</td>
</tr>
<tr>
<td>pH</td>
<td>not applicable</td>
</tr>
<tr>
<td>Melting point / freezing point</td>
<td>~ 3,500°C</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>not applicable</td>
</tr>
<tr>
<td>Flashpoint</td>
<td>not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>not applicable</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>not applicable</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>not applicable</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>not applicable</td>
</tr>
<tr>
<td>Vapor density</td>
<td>not applicable</td>
</tr>
<tr>
<td>Specific gravity (relative density)</td>
<td>1.81 (H₂O @ 4°C = 1.00)</td>
</tr>
<tr>
<td>Solubility (ies)</td>
<td>negligible (dispersible)</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td></td>
</tr>
<tr>
<td>n-octanol/water</td>
<td>not applicable</td>
</tr>
<tr>
<td>Auto ignition temperature</td>
<td>not applicable</td>
</tr>
</tbody>
</table>
Decomposition temperature (in Air)
sizing preparation;
carbon fiber;  >240°C
>650°C

Viscosity
not applicable

Explosive properties:
potential for weak explosion with milled fiber or dusts
Class St 1* / <50 Kst (bar·m/s)
*OSHA CPL 03-00-008 – Combustible Dust National Emphasis Program

Oxidizing properties
not applicable

9.2 Other information
no other information available

SECTION 10: Stability and reactivity

10.1 Reactivity
see SECTION 10.3

10.2 Chemical stability
stable under normal ambient and anticipated storage and handling conditions of temperature and pressure

10.3 Possibility of hazardous reactions
can react with strong oxidizing agents

10.4 Conditions to avoid
see SECTION 7

10.5 Incompatible materials
see SECTION 10.3

10.6 Hazardous decomposition products
Products of combustion and decomposition will depend on other materials present in the fire and the fire conditions. Burning will produce CO₂, CO, and minute amounts of N₂, HCN and H₂O.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
no data available
Skin corrosion/irritation
no data available
Serious eye damage/irritation
no data available
Respiratory or skin sensitization
no data available
Germ cell mutagenicity
no data available
Carcinogenicity
no data available
Reproductive toxicity
no data available
STOT-single exposure
no data available
STOT-repeated exposure
no data available
Aspiration hazard
not an inhalation hazard
filament diameter >3µm / non-respirable (IARC)

SECTION 12: Ecological information

12.1 Toxicity
not data available

12.2 Persistence and degradability
no data available
12.3 Bioaccumulative potential  no data available
12.4 Mobility in soil  no data available
12.5 Results of PBT and nPvB assessment  no data available
12.6 Other adverse effects  ecological data not available

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Waste materials must be disposed of in accordance with the Directive on waste 2008/98/EC and any other applicable national or local regulations.

SECTION 14: Transport information

14.1 UN number  see SECTION 14.2
14.2 UN proper shipping name  not Dangerous Goods
ADR/RID (land)
ADN (inland navigation)
IMDG (marine)
14.3 Transport hazard class(es)  see SECTION 14.2
14.4 Packing group  see SECTION 14.2
14.5 Environmental hazards  see SECTION 14.2
14.6 Special precautions to user  see SECTION 6 to 8
14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC code  not applicable

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
TSCA Status  Exempt - satisfies ‘article’ definition under 40 CFR 704.3
15.2 Chemical safety assessment  has not been carried out
SECTION 16: Other information

16.1 Revision date: 17 March 2016, CN: 1371

16.2 Previous revision: 5 October 2015, CN: 1337

16.3 Abbreviations and acronyms

ADN = Accord européen relative au transport international des marchandises dangereuses par voie de navigation intérieure
ADR = Accord européen relative au transport international des marchandises Dangereuses par Route

CAS = Chemical Abstracts Service

CLP = Classification, Labelling and Packaging

EEC = European Economic Community

EINECS = European Inventory of Existing Commercial Chemical Substances

ELINCS = European List of Notified Chemical Substances

IBC-Code = International Coder for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk

IMDG = International Maritime Code for Dangerous Goods

MARPOL = International Convention for the Prevention of Marine Pollution from Ships

OSHA = Occupational Safety and Health Administration

PBT = Persistent, Bioaccumulative and Toxic substance

RID = Règlement concernant le transport international ferroviare de marchandises dangereuses

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