

SAFETY DATA SHEET

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 Toray Group

TRADE NAME

ZOLTEK™ PX MILLED CARBON FIBER

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

1.1 Product identifier

Product name	ZOLTEK™ PX Milled Carbon Fiber
Synonyms	milled fiber
Chemical family	carbon fiber
Product description	PX30 / PX32 / PX35 milled carbon fibers

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

1.2.1 Relevant uses	industrial applications
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1.2.2 Uses advised against	none known
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1.3 Details of the supplier of the safety data sheet

Company	Zoltek Companies, Inc. 3101 McKelvey Road St. Louis, MO 63044 USA (314) 291-5110 www.zoltek.com
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E-mail enquiry	sds@zoltek.com
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1.4 Emergency telephone number	+1 (314) 291-5110 8AM-5PM / M-F
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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/GHS]

not classified as hazardous

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

Hazard symbols none
R-phrases none

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

Hazard symbols none
R-phrases none
S-phrases none
Special labeling not applicable

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

<u>Component</u>	<u>CAS. #</u>	<u>EC #</u>	<u>%</u>
Carbon fiber (carbon) / polyacrylonitrile (PAN)-based (Nitrogen)*	7440-44-0 (7727-37-9)	231-153-3 (231-783-9)	91-100 (0-7%)
(Oxygen)* <i>*as part of carbon fiber</i>	(7782-44-7.)	(231-956-9)	(0-2%)

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	Remove by taping skin with adhesive surface material, such as Scotch® clear cellophane tape 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 vapors
may be formed during combustion

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.

6.4 Preventative measures against second disasters

Remove possible sources of ignition in the surrounding area

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/m³ (respirable fraction) and 15 mg/m³ (total dust). ACGIH has established an exposure value of 3 mg/m³ (respirable fraction) and 10 mg/m³ (total).

Japan Society of Occupational Health sets 0.5mg/m³ limit for inhalation dust and 2.0mg/m³ as the total dust that are classified as "Class 1 dust" by the Japanese regulation (2011)

NHFPC (PRC) has an established standard for carbon fiber's particulates not otherwise regulated set at 6mg/m³ ESTL (total dust) and 3mg/m³ 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

Appearance	black fiber
Odor	odorless
pH	not applicable
Melting point / freezing point	~ 3,500°C
Initial boiling point and boiling range	not applicable
Flashpoint	not applicable
Evaporation rate	not applicable
Flammability (solid, gas)	not applicable
Upper/lower flammability or explosive limits	not applicable
Vapor pressure	not applicable
Vapor density	not applicable
Specific gravity (relative density)	1.81 (H ₂ O @ 4°C = 1.00)
Solubility(ies) water	negligible (dispersible)
Partition coefficient n-octanol/water	not applicable
Auto ignition temperature	not applicable
Decomposition temperature (in Air)	>650°C
Viscosity	not applicable
Explosive properties:	potential for weak explosion with milled fiber or dusts Class St 1* / <50 K _{st} (bar·m/s) <small>*OSHA CPL 03-00-008 – Combustible Dust National Emphasis Program</small>
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 CO ₂ , CO, and minute amounts of N ₂ , HCN and H ₂ O.

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 >3 μ m / 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) IATA/ICAO (air)

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
IECSC Status	Listed - all components listed on China IECSC

15.2 Chemical safety assessment	has not been carried out
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SECTION 16: Other information

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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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