MATERIAL SAFETY DATA SHEET

1 – CHEMICAL PRODUCT & COMPANY IDENTIFICATION

Product name:
TPFL® Carbon / PPS

Product uses:
This material consists of carbon and polyphenylene sulfide (PPS) blended fibers that are spun in yarns or tapes that are ultimately converted in textures (braids, woven or multiaxial fabrics) to be used in the manufacture of composite parts. The fiber lengths measured in the beam range from 35 mm to 200 mm, the diameter of the fibers is equal to 7 microns.

Product code:
518XXX (Yarns), UDT-104-YYY-ZZZZ (UDT tapes), TIT-104-YYY-ZZZZ (Fabrics including ref. 90163P), TRT-104-YYY-ZZZZ (Braids), MAT-104-YYY-ZZZZ (Multiaxial fabrics)

Packaging:
Spools (Yarns, tapes, braids), Rolls (Fabrics, multiaxial)

Company Identification:
Schappe Techniques, Allée des Erables, 01150 Blyes France
Tél +33 (0)4 74 46 31 00  Fax +33 (0)4 74 34 79 35
Email: salesrd@schappe.com

Telephone number of emergency:
INRS / ORFILA : +33 (0)1.45.42.59.59

2 – HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture
This mixture has no physical danger. Refer to the recommendations regarding the other products present on the site.
This mixture does not present a health hazard.
This mixture does not present a danger to the environment. No damage to the environment are not known or expected under normal use.
If the temperature exceeds 450 degrees C, fumes irritating to the eyes, nose, and throat will be evolved. If exposed to these fumes, the eyes will tear, itch, and turn red. The nose will burn. The throat will burn and coughing may result.

2.2. Label elements
Commercial product used as fibers, fabrics or as a reinforcement in the manufacture of composite parts.
Do not use for any purpose other than that for which it is intended.

2.3. Other hazards: None

3 – COMPOSITION / INFORMATION ON INGREDIENTS

Chemical nature of the preparation:
Carbon fiber based on a polyacrylonitrile (carbon) : 20 - 80 %
PPS : 80 – 20 %

Hazardous substances present:
This preparation contains no hazardous substance in this category.

Other substances representing a hazard:
No known substance in this category present.
Substances present at a concentration below the minimum danger threshold:
R phrases and H in the table below: see section 16

<table>
<thead>
<tr>
<th>CAS Nº</th>
<th>EC Nº</th>
<th>Name</th>
<th>67/548/EC Symbols</th>
<th>R mentions</th>
<th>1272/2008/EC Symbols</th>
<th>H mentions</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>308063-67-4</td>
<td>231-153-3</td>
<td>Carbon fibers</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>20 - 80%</td>
</tr>
<tr>
<td></td>
<td>(7440-44-00)</td>
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<td></td>
<td></td>
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<tr>
<td>25212-74-2</td>
<td></td>
<td>PPS</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>80 - 20%</td>
</tr>
</tbody>
</table>

Other substances with occupational exposure limits:
No known substance in this category present.

4 – FIRST AID MEASURES

Inhalation:
In this presentation, remove the subject from the contaminated area to breathe fresh air. Keep warm and at rest. Consult a physician in case of respiratory symptoms.

Contact with skin:
In case of contact with skin, wash immediately with soap and water. In case of skin irritation continues, consult a doctor

Contact with eyes:
Rinse immediately with plenty of water for 15 minutes holding the eyelids open. Seek medical advice if irritation persists.

Ingestion:
Do not induce vomiting. If the person is conscious, rinse mouth and drink water. Call emergency relief medicalized SAMU (15) and FIRE (18) rescue Europeans (112). Show them the label and safety data sheet. Apply the rules of first aid.

5 - FIRE FIGHTING MEASURES

Suitable extinguishing media:
Suitable extinguishing media:

Extinguishing media not to be used for safety reasons:
Direct water projection.

Special hazards:
Toxic gases by pyrolysis (SOx, CO, CO₂). Incomplete combustion gives, in addition, carbon monoxide and hydrocarbon oxidation products including organic acids, aldehydes and alcohols. Prevent the flow of product into sewers, storm drains, natural environment.
See section (6)

Special protective equipment for personnel responsible for the fire fighting:
Wear a self-contained breathing apparatus pressure demand, skin, eyes and mucous membranes protection equipment

6 – ACCIDENTAL RELEASE MEASURES

Measures For Handling Personnel:
Do not inhale dust. Avoid contact with eyes and skin.

Measures For Environmental Effects:
Avoid contact with water and humidity.

Cleaning methods:
The recovered product must be disposed of in accordance with regulations. Pick up mechanically.
7 – HANDLING AND STORAGE

Handling:
Do not inhale dust. Avoid contact with eyes and skin.

Exposure control for handling personnel:
No special measures necessary if used correctly.

Storage:
Keep away from sources of ignition - no smoking. Dust in air can form an explosive mixture.
Do not store with oxidizing agents, acids and alkalis. Store in a dry, recommended storage temperature: <50 °C, relative humidity: avoid humidity to prevent lack of mechanical properties.
No other special measures necessary

Specific uses: Not applicable.

8 – EXPOSURE CONTROL/PERSONNEL PROTECTION

Exposure limit value: 250 000 mg/m³
Mean values of exposure: mean value of exposure applicable to dusts are those deemed ineffective specific dust: 5 mg/m³ respirable dust, total dust 10 mg/m³.
LD50 = 14 700 mg/kg (mouse)

Collective protection: Technical measures: Use only in well ventilated areas.

Personal protective equipment (PPE):
- Respiratory protection: In case of brief exposure, use a mask with filter, P1.
- Hand protection: Gloves suitable for the product: nitrile by prolonged exposure to the product> 120 min (EN 374)
- Eyes protection: Goggles.
- Skin protection: Protective clothing light.

Hygiene measures:
Do not eat, drink or smoke in the workplace. Before breaks and after work wash hands. Used protect skin cream.

Control exposure of the environment: Soluble in water: Prevent leakage of product into drains or environment. Thoroughly clean all traces of product or waste that will be treated as described in paragraph (13).

9 – PHYSICAL AND CHEMICAL PROPERTIES

General informations:
Incolor liquid without any particular odor.

Important informations about health, security an environment:
- Physical state / appearance: Fibers
- Color: From Black (C) to white (PPS)
- Odor: Inodore
- pH: Not applicable.
- Boiling point: Not applicable
- Melting point: 280-300°C for PPS
- Flash point: Not available
- Auto-ignition temperature: Not available
- Decomposition temperature: >400°C
- Explosives properties: Non explosive, see chapter 10
- Oxidising properties: None
- Vapor pressure: Not applicable
- Density at 20°C: 1.1 to 1.9
- Organic solvent solubility: soluble in concentrated nitric acid and strong oxidizers.
- Water solubility: non soluble
- Partition coefficient n-octanol/water: unknown
10 – STABILITY AND RÉACTIVITY

Reactivity

Chemical stability
This mixture is stable under the recommended storage and handling in Section 7.

Possibility of hazardous reactions
Reacts with strong oxidizing agents; acids and alkalis. Accumulation of fine carbon dust may, in the presence of air, present an explosion hazard.

Conditions to avoid
Avoid excessive heat, open flame.

Incompatible materials
Keep away from/to: - concentrated sulfuric acid.

Hazardous Decomposition Products
Thermal decomposition in the presence of oxygen (air) may release/form toxic gases such as carbon monoxide (CO), sulfur oxide (SOx).

11 – TOXICOLOGICAL INFORMATIONS

General informations:

Acute toxicity: Not determined.
Inhalation: Not determined.
Skin contact: Not determined.
Eyes contact: Not determined.
Ingestion: Not determined.
Sensitization: Not determined.
Long term effect:/Chronic toxicity: Not determined.

CMR effects (Carcinogenic, Mutagenic, toxic to Reproduction): Not determined.
General note: The undegraded product has no toxicological risk.

12 –ECOLOGICAL INFORMATIONS

Ecotoxicity:
Not determined

Mobility:
The product is not soluble in water.

Persistence et degradability:
Non-biodegradable

Bioaccumulation potential:
Not determined

Others harmful effects:

13 – DISPOSAL CONSIDERATIONS

Waste, unused products:
Consult manufacturer for recycling. Coordinate disposal with the authorities if necessary.

Contaminated packaging:
Uncontaminated packaging can be recycled. Contaminated packaging should be removed in the same manner as the product.

National and local regulations:
See the Environmental Code.

14 – TRANSPORT INFORMATION

This product is not regulated/classified as dangerous or hazardous goods under ADR, RID, DOT, IMO, ICAO, IATA, IMDG or UN shipping.

15 – REGULATORY INFORMATION

Regulations / legislation specific for the substance or mixture safety, health and environment
This safety data sheet complies with the requirements of EC Regulation 1907/2006 amended by Regulation 453/2010/EC.

16 – OTHER INFORMATION

Working conditions of the user are not known, the information in this safety data sheet are based on our state of knowledge and on national and community regulations.
The substance should not be used for other purposes than those specified under section 1 without first obtaining written handling instructions.
It is always the responsibility of the user to take all necessary measures to meet the requirements of local laws and regulations.
The information in this safety data sheet must be regarded as a description of the safety requirements relating to the mixture and not as a guarantee of the properties of the latter.

Text of risk phrases R, H, EUH mentioned in section 3 for raw materials in its purest:

EC 67/548/EC: /
EC 1272/2008: /