Toyobo Develops High Strength Polyethylene Fiber Tsunooga™

Toyobo Co. Ltd. has developed Tsunooga™, a high strength melt spinning polyethylene fiber with superior lightness and cut resistance. Tsunooga™ was developed using Toyobo’s proprietary technologies. It is a new super fiber with expected applications across diverse industrial fields.

1. Development Background
Toyobo’s super fibers are being used in a wide variety of industrial fields. The company has continuously created new super fibers to develop new markets and expand our super fiber product line. These efforts have now resulted in the development of Tsunooga™ – a completely new high strength fiber created using Toyobo’s unique technologies.

2. Product Characteristics
(1) Superior Lightness and Cut Resistance
Tsunooga™ surpasses para-aramid fibers in lightness and cut resistance, and offers more than twice the cut resistance of nylon and polyester fibers (evaluated using the EN 388 “coup test”). Tsunooga™ also provides outstanding light, water and chemical resistance.

<table>
<thead>
<tr>
<th>Fiber Type</th>
<th>Specific Gravity</th>
<th>Strength (cN/dtex*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tsunooga™</td>
<td>0.97</td>
<td>14.0</td>
</tr>
<tr>
<td>Para-aramid fibers</td>
<td>approx. 1.45</td>
<td>approx. 20.0</td>
</tr>
<tr>
<td>Polyester fibers</td>
<td>approx. 1.38</td>
<td>approx. 8.0</td>
</tr>
<tr>
<td>Nylon fibers</td>
<td>approx. 1.16</td>
<td>approx. 8.0</td>
</tr>
</tbody>
</table>

*cN/dtex (centinewton/decitex): unit indicating fiber strength.

(2) Spin-Dyeing Possible
Because it is suitable for spin-dyeing, Tsunooga™ can be produced in various colors.

3. Future Plans
Toyobo will initiate commercial production of Tsunooga™ at our Tsuruga Functional
Materials Plant this July with an initial production scale of 200 tons per year. We will advance sales worldwide for such applications as work gloves and protective clothing, taking advantage of the superior cut resistance properties. Applications are also expected in the food industry. Toyobo will work to further expand our industrial fibers operations with the addition of this new super fiber to the product line.

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