Carbon fibre pultruded profiles

A/Description:
Toray carbon fibre profiles are obtained by pultrusion, a low-cost, high volume manufacturing process. Toray profiles are available in rods and plates based on Torayca® carbon fibre.

B/Features and benefits:
Excellent Strength and stiffness/weight ratio
Excellent fatigue behaviour
Dimensional stability
Available in long lengths (coils or rolls).
Available with different Tg level (between 80°C to 195°C).
Long-term Performance
Low density

C/Presentation:
The below description is not limited, for any specific request, please contact us.

- **Rods:** Diameter from 0.5 mm up to 20 mm

- **Plates:**
  Thickness from 1.2 to 20 mm.
  Width from 10 mm up to 150 mm.

- **Fibre:**
  High strength Torayca ® T 700
  Intermediate modulus Torayca ® T 800
  High modulus Torayca ® HM

- **Resin:**
  Epoxy (Tg up to 195°C), Vinylester.
  FST compliant.
D/Applications:

Toray carbon profiles are widely use as reinforcement in civil engineering, cable/tethers for deep offshore, train floor, beams and other industry applications. Reinforcement for sandwich structure

E/Packaging:

Toray carbon profiles are delivered in form of coils, reels, bobbins or tuned cuts:

- Rods:
  - Up to 3, 75 mm diameter:
    OD: 800 mm
    ID: 400 mm
    Width: 510 mm
  - From 3,75 up to 7 mm diameter:
    OD: 1600 mm
    ID: 1100 mm
    Width: 1100 mm
  - From 7 up to 12 mm diameter:
    OD: 2200 mm
    ID: 1800 mm
    Width: 1300 mm

For larger diameter 12 meters bar.

- Plates:
  - For thickness up to 2mm, coreless bobbins (internal diameter: 900mm)
  - For other thicknesses: 12-meters bar.

  • MARKING: plates can be customized in line (printing of Logo, Customer Reference, Batch No. etc.).
  • BONDING: upon request, a surface treatment can be carried out to improve subsequent plate bonding.
  • PROTECTION: the surface of the plate can also be covered with a peel-ply or a PST type plastic protective film.

F/ Winding and twisting:

Toray carbon profiles can be wound or bent without damage, with no tension, up to the following limit:

\[
\text{Winding/bending diameter} = 110 \times \text{diameter for rods} \quad \text{and} \quad 110 \times \text{thickness for laminates.}
\]

If during winding or bending some tension/load is applied on the profile, bigger winding/bending diameter should be considered.

Toray carbon profiles can be twisted without damage, with no tension, up to the following limit:

\[
\text{Length of one twist turn} = 200 \times \text{diameter for rods.}
\]
**E/ Mechanical performance:**

All the performance values given in this data sheet are based on experimental results obtained during testing under laboratory conditions. They are typical values; they do not constitute specification minima. For any specific test or information feel free to contact TCFE.

### TORAY Carbon fibre UD profile T700S

**Mechanical properties normalised for FVC of 70% for Uni-Directional T700S**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Modulus (longitudinal)</td>
<td>160 GPa</td>
</tr>
<tr>
<td>Tensile Strength (longitudinal)**</td>
<td>2800 MPa</td>
</tr>
<tr>
<td>Tensile Elongation at break( longitudinal )</td>
<td>1,65 %</td>
</tr>
<tr>
<td>Shear Modulus</td>
<td>3.2 Gpa</td>
</tr>
<tr>
<td>Shear Strength</td>
<td>88 Mpa</td>
</tr>
<tr>
<td>0° coefficient of Thermal expansion (longitudinal)</td>
<td>1.26 μm/m</td>
</tr>
<tr>
<td>90° coefficient of Thermal expansion (Transverse)</td>
<td>52.3 μm/m</td>
</tr>
<tr>
<td>0° Thermal conductivity (longitudinal)</td>
<td>4.8 W/m°K</td>
</tr>
<tr>
<td>90° Thermal conductivity (Transverse)</td>
<td>1.43 W/m°K</td>
</tr>
</tbody>
</table>

**Thermal properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tg°C onset Epoxy</td>
<td>100°C</td>
</tr>
<tr>
<td>Tg°C onset Heat resistant Epoxy</td>
<td>195°C</td>
</tr>
<tr>
<td>Density</td>
<td>1.6</td>
</tr>
</tbody>
</table>

### TORAY Carbon fibre UD profile T 800S

**Mechanical properties normalised for FVC of 70% for Uni-Directional T800S**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Modulus (longitudinal)</td>
<td>200 GPa</td>
</tr>
<tr>
<td>Tensile Strength (longitudinal)**</td>
<td>2900 MPa</td>
</tr>
<tr>
<td>Tensile Elongation at break( longitudinal )</td>
<td>1,35 %</td>
</tr>
</tbody>
</table>

**Thermal properties**

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<tr>
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<td>195°C</td>
</tr>
<tr>
<td>Density</td>
<td>1.6</td>
</tr>
</tbody>
</table>

** for Standard epoxy only.

Values correspond to average value, not to individual values.
F/ Storage / Handling precautions:

The usual precautions necessary when handling carbon fibre profile should be observed. A Material Safety Data Sheet is available upon request.

G/ Contacts:

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