PRODUCTS DESCRIPTION

TenCate Cetex® TW-2000 is a continuous fiber reinforced thermoplastic (CFRT®) composite laminate. It blends the benefits of a thermoplastic polymer alloy with woven carbon fibers in a twill weave for enhanced performance. The TW-2000 style laminate is available in a single or multi-layer product; carbon fiber reinforcement at 0° and 90° orientations that is ultra-thin, lightweight, and resilient for improved energy return.

PRODUCT BENEFITS/FEATURES

- Twill weave of 12K carbon fibers
- Bi-directional carbon reinforcement
- Lightest weight and thin
- Color: Black (natural carbon)
- Available with ENVIR-Bond® tie layers for injection over-molding.

Composition:

Fibers........................ Woven 12K carbon fibers - twill weave, carbon fiber reinforcement at 0° and 90° orientations. Fiber Content 58%
Resin.......................... PMMA impact modified proprietary thermoplastic resin (42%).
(Note: Percentages are by volume and are nominal values)

TENCATE TW-2000 MATERIAL PROPERTIES

Specific Gravity ........................................... 1.44

Thickness: Available in single or multiple laminates (see table below)

Size: Cut to customer specifications from sheet of 91 x 122 cm (36 x 48 inches)

(Note: Material properties and thickness listed below are of the base panel without ENVIR-Bond® layers)

<table>
<thead>
<tr>
<th>Property</th>
<th>Condition</th>
<th>Method</th>
<th>1L Results:</th>
<th>2L Results:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexural Rigidity</td>
<td>RTD</td>
<td>ASTM D790-10</td>
<td>13.2 N/cm²</td>
<td>175.6 N/cm²</td>
</tr>
<tr>
<td>Flexural Modulus</td>
<td>RTD</td>
<td>ASTM D790-10</td>
<td>22.8 GPa</td>
<td>36.5 GPa</td>
</tr>
<tr>
<td>Flexural Strength</td>
<td>RTD</td>
<td>ASTM D790-10</td>
<td>450.0 MPa</td>
<td>671.0 MPa</td>
</tr>
<tr>
<td>Thickness</td>
<td><em>SI-QA-047</em></td>
<td><em>SI-QA-047</em></td>
<td>0.60 mm</td>
<td>1.30 mm</td>
</tr>
</tbody>
</table>

*SI-QA-047 is an internal TenCate inspection process.

TYPICAL CONSOLIDATION PARAMETERS OR PROCESSING INFO

Recommended Processing Temperatures........Forming 195°C to 200°C (383°F - 392°F)
Bonding 55°C to 60°C (131°F - 140°F)