Fibers for Thermoplastic Composites and Binder Yarn for Resin Transfer Molding

GRILON®

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# Thermoplastic Fibers for Composites

<table>
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<th>Grilon - Matrix Fibers(^\circ) - Yarn(^\circ)</th>
<th>Polymer</th>
<th>Melting Point</th>
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<tr>
<td>EP 1357(^\circ)</td>
<td>HTg PA</td>
<td>240° C</td>
</tr>
<tr>
<td>EP 1243(^\circ)</td>
<td>HTg PA</td>
<td>240° C</td>
</tr>
<tr>
<td>EP 1310(^\circ)</td>
<td>PA 6</td>
<td>220° C</td>
</tr>
<tr>
<td>EP 1205(^\circ)</td>
<td>PA 12</td>
<td>178° C</td>
</tr>
<tr>
<td>K-178(^\circ)(^\circ)</td>
<td>PA 12</td>
<td>178° C</td>
</tr>
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## Properties:

- heat-resistant
- impact-resistant
- chemical-resistant
- thermoplastic material
Composite

Thermoplastic Composite

production of hybrid fabric

preheating

moulding

demoulding

finishing

grinding, polishing

painting

RTM = Resin Transfer Moulding

preheating

preforming

moulding

curing/
cross-linking

demoulding

finishing

grinding, polishing

painting

RTM = Resin Transfer Moulding
# Binder Yarns for Preforming (RTM)

<table>
<thead>
<tr>
<th>Grilon Binder Yarn</th>
<th>Polymer</th>
<th>Melting Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-140</td>
<td>CoPA</td>
<td>140° C</td>
</tr>
<tr>
<td>KE-60</td>
<td>PES</td>
<td>60° C</td>
</tr>
<tr>
<td>KE-140</td>
<td>High Performance Polymer</td>
<td>140° C</td>
</tr>
<tr>
<td>Grilon MS</td>
<td>Phenoxy</td>
<td>(Tg: 85° C)</td>
</tr>
<tr>
<td>K-178</td>
<td>PA12</td>
<td>178° C</td>
</tr>
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**Properties:**

- bonding strength
- impact-resistant modification
- flow support
- resin compatibility
Compression after Impact (CAI)

Increase of residual compressive with GRILON Fibers and Yarns

NWF = Nonwoven Fabric, 20 g/m²; Grids 11 g/m²

- Standard: AITM 1-0010
- CFC, UD carbon fabric (298 g/m²)
- Resin: HEXFLOW RTM6
- Interlayers: Grilon EP 1205, KA-140 (fibers) and K-178, K-140 (yarn)
Interlaminar Shear Strength (ILSS)

Positive influence on ILSS with Grilon Fibers and Yarns

NWF = Nonwoven Fabric, 20g/m²; Grids 11 g/m²
- Standard: AITM 1-0010
- CFC, UD carbon fabric TOHO TENAX (298 g/m²)
- Resin: HEXFLOW RTM6
- Interlayers: Grilon EP 1205 (fibers) and K-178 (yarn)
Permeability

Comparative plot of the permeability of dry preforms

- Standard: AITM 1-0010
- CFC, UD carbon fabric TOHO TENAX (298 g/m²)
- Interlayers: Grilon K-178 (yarn)
Our customers rely on our extensive research and development experience, expert advice and consistent product quality. They benefit from our modern application and testing laboratories where new products and applications are developed continuously.
Grilon
are technical fibers and fusible bonding yarns. EMS-GRILTECH focuses on the production of technical speciality fibers based on polyamides. Products include fusible bonding fibers made from copolyamides or copolyesters, bicomponent fibers, and abrasion resistant polyamide fibers, e.g. for the paper machine industry. Using our thermoplastic separation and bonding yarns, knitted fabrics can be separated. Textile components and composites can easily be bonded together. This leads to shorter production times, lower unit costs and improved solutions.

Nexylon
are technical fibers made out of polyamide (PA66) for high quality nonwovens and spinning yarn.

Nexylene
is a high performance fiber for hot gas filtration made out of polyph phenylene sulfide (PPS).
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