INTRODUCTION

ThinPreg™ 150SC is designed for the automotive market due to the snap-cure capability for low TAKT times while achieving good mechanical properties, and the additional benefit of not requiring frozen or refrigerated storage.

ThinPreg™ 150SC is a hot-melt prepreg using a 100% solids, monomer-free, urethane-modified, vinyl-hybrid resin with excellent initiated stability and rapid cure at elevated temperature.

ThinPreg™ 150SC can be cured in 1 minute at 150°C (302°F). This is achieved with a good out-life of up to 6 months at 18-22°C (64-72°C). It offers excellent mechanical properties on a wide variety of fibres.

ThinPreg™ 150SC has an enthalpy of circa 70J/g. It can be used to make thick parts with low risk of exotherm.

When curing the resin is less thermally stressed resulting in high ILSS performance; ThinPreg™ 150SC has an inter laminate shear strength equivalent to high performance structural epoxy prepregs.

FEATURES

- Snap-cure characteristics for fast cycle times
- Does not require frozen or refrigerated storage
- Designed for use with ATL machines and press moulding or autoclaving
- Suitable tack for most hand layup and automated tape placement processes
- Ideal for prepreg from 50gsm to 300gsm
- Available on a variety of fibres

PURPOSE

ThinPreg™ 150SC is commonly used in press moulding and autoclave processes. It is anticipated to be used in high production volume components utilising Automated Tape Laying deposition, pick and place transfer to a press, and rapid curing cycles to allow cycle times in the minutes.
INTRODUCTION

NTPT (North Thin Ply Technology) offers a range of Automated Tape Laying equipment for the efficient incorporation of prepreg into molded parts. This unique technology, offered at an economical price, allows users looking to reduce labor costs, reduce material wastage, and increase part quality.

A new generation of ATL machine, marketed at an ‘everyday’ price is affordable to smaller molding companies and no possibility of prepreg backers being left within the laminate.

NTPT’s ATL solutions are widely used on composite parts. Offered with full design, kitting, and draping software, NTPT’s ATL equipment brings high quality, efficient part production, reduced part contamination, and reduced exposure of uncured polymeric materials to the work force are some of the many advantages NTPT brings.

Estimates that a single ATL can handle the work of eight to ten composite laminators, with full traceability, looking to reduce labor costs, reduce material wastage, and increase part quality.

AUTOmATION AT AN AFFORDABLE PRICE

Video control is able to view the most critical aspects of the tape laying operation live from a remote computer. An onboard camera enables a remote and real time control of the tape laying operation. A remote operator working surface by the cutting plotting gantry.

The top of the table is located at 800mm.

Footprints are offered according to the following ranges:
- L series: W= 4 to 4.5m x L=6 to 14m (24 to 63sqm)
- m series: W= 3m to 4m x L = 3 to 6m (9 to 24sqm)
- s series: W= <2m x L = 2 to 5m (4 to 10sqm)

The plotting surface is defined as the area on which tapes can be laid in any direction and cut at any angle.

CURE CYCLES

The laminate can be cured at a variety of temperatures from above 135°C (270°F) with a cure time from 4 minutes to 60s. Please discuss with a NTPT representative to design a cure cycle for your process.

NTPT ThinPreg™ 150SC data sheet

This document is updated regularly. It is the responsibility of the user to check he has the latest version available.

TYPICAL CHARACTERISTICS

Rheology ThinPreg™ 150SC resin viscosity profile

MECHANICAL PERFORMANCE

Cured resin mechanical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Symbol</th>
<th>ThinPreg™ 150SC</th>
<th>Test standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength</td>
<td>σT</td>
<td>78.6 MPa</td>
<td>11400 psi</td>
</tr>
<tr>
<td>Tensile modulus</td>
<td>ET</td>
<td>3.0 GPa</td>
<td>440 Kpsi</td>
</tr>
<tr>
<td>Tensile elongation</td>
<td>%</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Flexural strength</td>
<td>σF</td>
<td>137.9 MPa</td>
<td>20000 psi</td>
</tr>
<tr>
<td>Flexural modulus</td>
<td>EF</td>
<td>4.4 GPa</td>
<td>645 Kpsi</td>
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</tbody>
</table>

Unidirectional laminate properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Symbol</th>
<th>HEC* Carbon Fiber</th>
<th>Test Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber density</td>
<td>ρFiber</td>
<td>1.8 g/cm³</td>
<td>0.065 lb/in³</td>
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<tr>
<td>Fiber modulus</td>
<td>E_Fiber</td>
<td>240 Gpa</td>
<td>34.81 Msi</td>
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<tr>
<td>Fiber strength</td>
<td>X_Fiber</td>
<td>4120 Mpa</td>
<td>598 Ksi</td>
</tr>
<tr>
<td>Cured ply density</td>
<td>ρ_Ply</td>
<td>1.62 g/cm³</td>
<td>0.059 lb/in³</td>
</tr>
<tr>
<td>Glass transition temperature</td>
<td>T_g</td>
<td>135 °C</td>
<td>234.5 °F</td>
</tr>
<tr>
<td>0° Tensile strength (normalized to 60%)</td>
<td>X_0</td>
<td>1678 Mpa</td>
<td>131.9 Ksi</td>
</tr>
<tr>
<td>0° Tensile poisson’s ratio</td>
<td>E_0</td>
<td>0.173</td>
<td></td>
</tr>
<tr>
<td>0° Compressive strength (normalized to 60%)</td>
<td>X_C</td>
<td>1056 Mpa</td>
<td>153.2 Ksi</td>
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<tr>
<td>0° Compressive modulus (normalized to 60%)</td>
<td>E_C11</td>
<td>125 Gpa</td>
<td>18.13 Msi</td>
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<tr>
<td>+45° In plane shear strength</td>
<td>t_12u</td>
<td>63 Mpa</td>
<td>9.1 Ksi</td>
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<tr>
<td>+45° In plane shear modulus</td>
<td>G_12</td>
<td>3.90 Gpa</td>
<td>0.57 Msi</td>
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<tr>
<td>0° ILSS</td>
<td>X_4,SS</td>
<td>90 Mpa</td>
<td>13.1 Ksi</td>
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</table>

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GENERAL INFORMATION

Storage
ThinPreg™ 150SC will benefit from being stored at -18°C and out of direct sunlight however the product can be stored at ambient temperatures for up to 6 months without adversely affecting the material.

To avoid condensation on their surfaces, allow rolls to reach room temperature before unwrapping.

Health and safety
ThinPreg™ 150SC contains resins which can cause allergic reaction. When uncured, ThinPreg™ 150SC should be handled with appropriate gloves. When cured, a composite laminate made of ThinPreg™ 150SC should be cut, drilled or machined in a room equipped with an exhaust ventilation and filtration system, by operators wearing protective clothing and masks. Refer to Material Safety Data Sheet for further information.

Notice and disclaimer
The Company strongly recommends that Customers make test panels and conduct appropriate testing of any goods or materials supplied by the Company to ensure that they are suitable for the Customer’s planned application. Such testing should include testing under conditions as close as possible to those to which the final component may be subjected. The Company specifically excludes any warranty of fitness for purpose of the goods other than as set out in writing by the Company.

All advice, instruction or recommendation is given in good faith but the Company only warrants that advice in writing is given with reasonable skill and care. No further duty or responsibility is accepted by the Company. All advice is given subject to the Terms and Conditions of sale (the Conditions) which are available on request from the Company.

The Company reserves the right to change specifications and prices without notice and Customers should satisfy themselves that information relied on by the Customer is that which is currently published by the Company on its website. Any queries may be addressed to the Technical Services Department.

NTPT continuously reviews and updates its literature. Please ensure that you have the current version, by contacting your NTPT sales contact and quoting the revision number.

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