INTRODUCTION

ThinPreg™ 513 is a prepreg resin matrix used for the manufacture of light weight prepreg moulding materials. ThinPreg™ 513 is a versatile system that is used most often with carbon fibre, but can also be impregnated into a wide range of reinforcing fibres including quartz, glass, aramid etc.

ThinPreg™ 513 is a toughened system, and has been designed to be a good all-round product in terms of mechanical strength and processability. ThinPreg™ 513 can be used for both vacuum bag and autoclave moulding with a recommended cure cycle at 120°C, and between 3 to 7 atmospheres of pressure.

ThinPreg™ 513 is especially suited to low fibre areal weight products (FAW), and is typically supplied with a resin content ranging from 32 to 42% by weight.

FEATURES

• Wide range of Fiber Areal Weight, including extremely light tapes
• Toughened epoxy resin system
• High prepreg flexibility
• Low tack
• Out life of 80 days at 21°C (70°F)

BENEFITS

• Almost unlimited possibilities of composite structure design
• High mechanical properties
• Easy handling and dressing in a mould
• Possibility of repositioning material in the mould
• Possibility of making large and/or complex parts with long mold dressing time before curing

Light weight prepreg tapes (<75gsm) should be handled carefully.

For parts larger than 1m² (1.2sq yd), North Thin Ply Technology strongly recommends to use a complex made of ThinPreg™ 513 laid down with an Automated Tape Laydown system as shown above.

This solution minimizes mold dressing time and thus total cycle time, ensures an accurate lay down of every single piece of tape, in every designed direction, eliminates human errors.
INSTRUCTIONS FOR USE

Curing cycle

ThinPreg™ 513 offers its best performance when molded in an autoclave at 120°C / 250°F with a maximum pressure of 6 bars. ThinPreg™ 513 can also be cured out of autoclave, in a vacuum bag.

Recommended curing conditions in autoclave for a monolithic part (<15mm thick)

Dress ThinPreg™ 513 in the mold and cover the laminate with vacuum bag. Apply vacuum and place the mold and laminate in the autoclave. Do not hesitate to let the laminate under vacuum for several hours before heating up. Then ram up the temperature of the oven to 80°C/175°F at maximum 2°/ minute

Stabilize the temperature at 80°C/175°F for approximately 30 min so as to increase the autoclave pressure from 1 to 5 or 6 bars. Once the pressure applied, ramp up the temperature again at maximum 2°C/min to reach 120°C/250°F

Stabilize the temperature for 2 hours at 120°C/250°F

Cool down at maximum 2°/ min to reach room temperature. Keep the autoclave pressure during cooling down and release after complete curing cycle

For thicker laminates, please contact North Thin Ply Technology team.
**INTRODUCTION**

NTPT (North Thin Ply Technology) offers a range of Automated Tape Laying equipment for the efficient production of composite parts. Offered with full design, kitting, and draping software, NTPT’s ATL solutions are widely used on a daily basis. Detailed product information is below:

**AUTOmATION AT AN AffORDAbLe PRICe**

NTPT estimates that a single ATL can handle the work of eight to ten composite laminators, with full traceability, and no possibility of prepreg backers being left within the laminate. 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’s ATL equipment brings.

A new generation of ATL machine, marketed at an ‘everyday’ price is affordable to smaller molding companies looking to reduce labor costs, reduce material wastage, and increase part quality.

**FUNCTIONALITIes**

- Video control
- Drawing and cutting curves
- Plotting curves
- Traceability

**DIMeNsIOns**

- The top of the table is located at 800mm.
- Table height
- Custom: by arrangement
- 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)

**TYPICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Cured matrix Properties (after the above mentioned curing cycle has been applied)</th>
<th>International System of Units</th>
<th>American System</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.24 x10³ kg/m³</td>
<td>77.4 Lb/ft³</td>
<td>ISO 1183</td>
</tr>
<tr>
<td>Color</td>
<td>Light beige</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Tg by DSC</td>
<td>142°C</td>
<td>267°F</td>
<td>/</td>
</tr>
<tr>
<td>Tg by DMA</td>
<td>127°C</td>
<td>260°C</td>
<td>DMA Onset E’</td>
</tr>
<tr>
<td>Tensile Modulus</td>
<td>3.1 GPa</td>
<td>449 Ksi</td>
<td>ISO 527</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>54 MPa</td>
<td>7.8 Ksi</td>
<td>ISO 527</td>
</tr>
<tr>
<td>Tensile Strain to Failure</td>
<td>1.92%</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Flexural Modulus</td>
<td>3.3 GPa</td>
<td>478 Ksi</td>
<td>ISO 178</td>
</tr>
<tr>
<td>Flexural Strength</td>
<td>120 MPa</td>
<td>17.4 Ksi</td>
<td>ISO 178</td>
</tr>
<tr>
<td>Flexural Strain to Failure</td>
<td>4.10%</td>
<td>/</td>
<td>/</td>
</tr>
</tbody>
</table>

**Cured ThinPreg™ 513 laminate properties (after the above mentioned curing cycle has been applied)**

<table>
<thead>
<tr>
<th>Fiber volume / weight fraction</th>
<th>With Toray Fiber T700</th>
<th>With Toray Fiber M40J</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inter Laminar Shear Strength for the laminate structure: 100%@0°</td>
<td>83.0 MPa 12.0 ksi</td>
<td>76.5 MPa 11.1 ksi</td>
<td>ASTM 2344</td>
</tr>
<tr>
<td>Tensile Modulus (corrected to 60% Vol Frac)</td>
<td>136.3 GPa 19768 Ksi</td>
<td>221.2 GPa 32082 Ksi</td>
<td>ASTM D3039</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>2609 MPa 378 Ksi</td>
<td>2104 MPa 305 Ksi</td>
<td>ASTM D5467</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>/</td>
<td>176 Ksi</td>
<td>ASTM D5467</td>
</tr>
</tbody>
</table>

**Resin viscosity profile:**

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**NTPT ThinPreg™ 513 data sheet**

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

**Storage**
ThinPreg™ 513 should be stored at -18°C (0°F) to reach the maximum shelf life of 24 months. At 21°C (70°F), the out life is 80 days.

**Packaging**
ThinPreg™ 513 is wound into 300 mm (11.8 inches) wide rolls on a 76 mm (3 inches) inner diameter cardboard tube. ThinPreg™ 513 is supported on a bottom silicon paper. The standard roll length is 150 linear meters (164 yards).

**Health and safety**
ThinPreg™ 513 contains epoxy resins which can cause allergic reaction. When uncured, ThinPreg™ 513 should be handled with appropriate gloves. When cured, a composite laminate made of ThinPreg™ 513 should be cut, drilled or machined in a room equipped with an exhaust ventilation and filtration system, by operators wearing protective cloth and masks. Refer to Material Safety Data Sheet for further information.

**Notice**
The information contained in this publication is based on actual laboratory data and field test experience. We believe this information to be reliable, but do not guarantee its applicability to the user’s process or assume any responsibility or liability arising out of its use or performance. The user has to determine the properties of its own commercial compounds when using this product. Because of numerous factors affecting results, we make no warranty of any kind, express or implied, including those of merchantability and fitness for a particular purpose.

**Contact**
North Thin Ply Technology
Chemin du Closel 3
1020 Renens
Switzerland
Tel: +41 (0) 21 811 08 88
sales@thinplytechnology.com / www.thinplytechnology.com

NTPT ThinPreg™ 513 data sheet
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