NTPT (North Thin Ply Technology™) offers Automated Tape Laying (ATL) equipment for the efficient incorporation of prepregs into moulded parts. This unique technology, offered at an economical price, allows users to save on both materials and labour costs, whilst retaining full design freedom for the manufacture of advanced composite parts. Offered with full design, kitting, and nesting software, NTPT’s ATL solutions are widely used on a daily basis.

NTPT’s ATL machines were developed during the company’s invention of the 3Di™ sail technology, which was later licenced to North Sails. This innovation required a practical and economic way of making carbon fibre sails using lightweight tapes, and the NTPT ATL process was born. The equipment available today remains suitable for that original application, but has a usability, cost-base and size capability equally suited to aerospace, automotive and other marine sectors.

Today’s NTPT ATL equipment is simple, light and efficient. Machinery packages are designed and manufactured for clients’ own use, as well as used in-house for the manufacture of NTPT’s 2D preforms using prepregs from 15-300gsm. NTPT ATL machines are not, however, limited to the use of thin ply prepregs, or indeed prepregs from NTPT.
AUTOMATION AT AN AFFORDABLE PRICE

Composite manufacturers across different markets are experiencing the following benefits with the NTPT ATL solution:

- Significant labour cost reduction, especially in higher labour cost countries – NTPT estimates that a single ATL can handle the work of 8-10 composite laminators
- Total control of lay-up accuracy, repeatability and traceability, satisfying the requirements of a Tier 1 quality management system
- Improved health and safety due to reduced handling of uncured polymeric materials
- Versatility and ease of use, allowing savings on small projects as well as high volume production runs
- Reduced overall moulding cycles and more efficient mould utilisation, due to reduced lamination time
- Quicker return on investment compared with more expensive ATL solutions

The new generation of ATL machine is also cost-effective for smaller moulding companies looking to reduce labour costs, reduce material wastage, and increase part quality.

SPECIFICATION

Whilst NTPT work with customers to design a bespoke ATL solution that will best fit their individual requirements, machines are built from a set of customisable standard products. A typical ATL machine specification might be:

<table>
<thead>
<tr>
<th>Machine footprint</th>
<th>Typically 12m long x 4m wide. Other dimensions on demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table height</td>
<td>800mm</td>
</tr>
<tr>
<td>Deposition rate</td>
<td>200-300 linear m/hr depending on material and component</td>
</tr>
<tr>
<td>Aerial weight range</td>
<td>Suitable for prepregs 15-300gsm</td>
</tr>
<tr>
<td>Raw material width</td>
<td>Maximum prepreg width 300mm (12”)</td>
</tr>
<tr>
<td>Overlap/gap tolerance</td>
<td>+/- 1.0mm</td>
</tr>
<tr>
<td>Cutting tolerance</td>
<td>+/- 1.0mm</td>
</tr>
<tr>
<td>Tape cutting angles</td>
<td>Includes angle cutting to minimise waste of angle plies at preform edge</td>
</tr>
<tr>
<td>Software supplied</td>
<td>Suite including: TPT® Designer; TPT® Nester; TPT® Tracker; and TPT® Stock Manager</td>
</tr>
</tbody>
</table>
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 equipment brings.

EASY INSTALLATION & TRAINING

NTPT ATL solutions are widely used on composite parts. Offered with full design, kitting, and draping software, NTPT’s ATL machines are supplied with an integral cutting gantry. Curves can be drawn or cut curves across the entire working surface.

Video control

An onboard camera enables remote and real time control of the tape laying operation. A remote operator can view the most critical aspects of the tape laying operation live from a remote computer.

PRODUCTION RATE

A standard production rate of up to 300 linear metres per hour is achievable (depending on part geometry and tape length). Productivity can be further improved by nesting the shapes - with a potential to double this rate.

SAFETY AND CERTIFICATION

The NTPT ATL solution complies with CE machine certification.

FUNCTIONALITY

→ Laying down tapes
NTPT ATL lays down prepreg tapes, with the fibre areal weight ranging from 15gsm to 300gsm.

→ Drawing and cutting curves
NTPT’s ATL machines are supplied with an integral cutting gantry, which can draw or cut curves across the entire working surface.

→ Video control
An onboard camera enables remote and real time control of the tape laying operation. A remote operator can view the most critical aspects of the tape laying operation live from a remote computer.
PRODUCTION SOFTWARE ARCHITECTURE
(Standard Installation)

The standard installation of the NTPT ATL machine includes the following software:

→ TptDesigner
The user interface for defining NTPT multi-ply preform for a given geometry

→ TptNester
A program to organise the preforms on the ATL table and to generate the file for the tape layer as well as nesting reports

→ TptTracker
A program that controls and archives the work done by the ATL in real time

→ TptStockManager
A data based program to control, visualise, organise and edit the stock of composite components such as: rolls of prepreg, adhesive film or preforms

→ Tangent Cut
The cutting and drawing gantry command software

AUTOMOTIVE

Cycle time and cost are no longer barriers for OEMs adopting composite construction for car body structures. NTPT’s Automated Tape Laying machine addresses both these challenges - plus it offers efficiencies in material yield, consistency of quality, and enables full freedom of design due to the use of Thin Ply prepregs in conjunction with the ATL process.

For example: an annual run of preforms for 10,000 2m² bonnets, utilising 5 plies of 200gsm unidirectional carbon prepreg, could be achieved with a single shift (8.3hrs/day for a 250 day working year).

MARINE

The versatility of the NTPT Automated Tape Laying solution makes it suitable for numerous marine components, particularly bowsprits, bulkheads and hulls. This, combined with the proprietary ease-to-use software, and the ability to exactly match a finely tuned specification, makes it an attractive choice for builders of complex one-off custom boats as well as production vessels.

For example: bulkhead kits can be manufactured as a simple preform, ready to apply to the sandwich core, with design features such as large cut outs and reinforcement patching easily incorporated using the ATL machine.