

Thermoplastic and Thermoset Laminate Production

Tape Placement Machines

Background

The worldwide increasing industrial use of fiber-reinforced plastics (FRP) demands for automated FRP production technologies using unidirectional (UD) thermoplastic tapes, dry-fiber rovings and thermoset prepregs in order to enable cost-efficient lightweight components with local UD-fiber reinforcements. Conbility GmbH is a German special-purpose machine manufacturer, developing and providing industrial machine systems for the placement and winding of UD-fibers (tapes, dry-fiber-rovings, thermoset-prepregs), based on more than 25 years of experience of the Fraunhofer-Institute IPT, Aachen, Germany.

Our Offering

Our turn-key machine systems accomplish tape placement with in-situ consolidation which substitutes expensive subsequent consolidation processes in laminate manufacturing. Our standard machine systems address 3D-manufacturing (placement, winding) as well as 2D-manufacturing of laminates:

“Pre-Pro 3D” Modular applicable and multifunctional tape placement applicator, which can be integrated into existing robot systems. Equipped with decentral control system and HMI. One investment for 3 different technologies:

1. Thermoplastic Tape Placement and Tape Winding
2. Dry-Fiber Placement
3. Thermoset-Prepreg Placement (including a backing paper unwinding system)

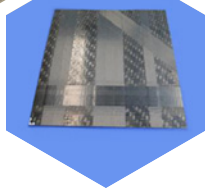
“Pre-Pro 2D” Machine system for thermoplastic tape placement with in-situ consolidation for the 2D laminate manufacturing (stiffening UD-profiles which can be used in injection molding, laminates for subsequent thermoforming processes, local UD-reinforcement of existing thermoplastic textile-based “Organo-sheets”).

Besides our standard machine systems, we offer customized machine development or adaption of our standard machines according to customers requirements using our engineering expertise.

Your Benefits

- One-stop shop for process know-how, technology transfer and machine systems for UD-fiber-reinforced lightweight manufacturing
- Expertise in building special-purpose machines
- In-situ consolidation technology: cost- and time-efficient, high laminate qualities (100% consolidation)
- Technology leadership in laser-assisted tape placement due to the close cooperation with Fraunhofer IPT, Aachen, Germany
- Modular usage of different heating systems, according to the customers requirements: e.g. high-power diode lasers, VCSEL-lasers, Infrared heater

Machine Systems: Technical Data



»PrePro 2D« Machine System

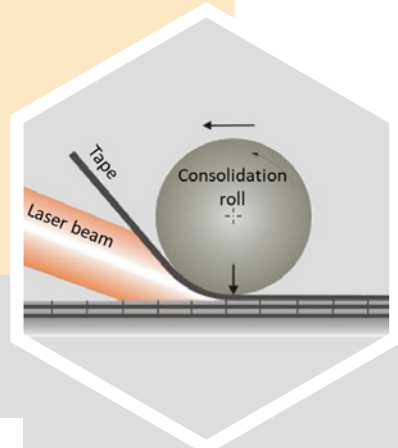
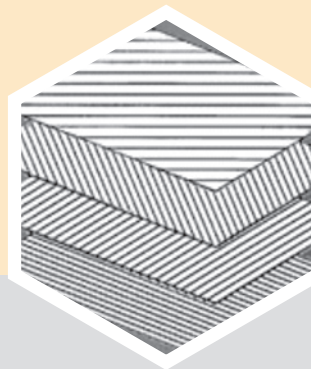
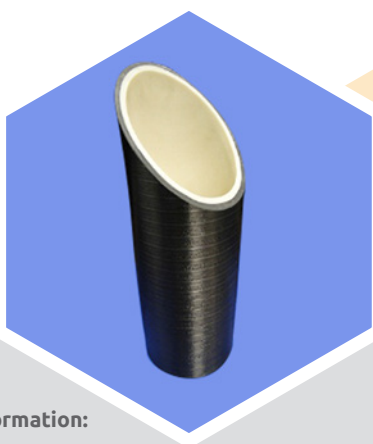
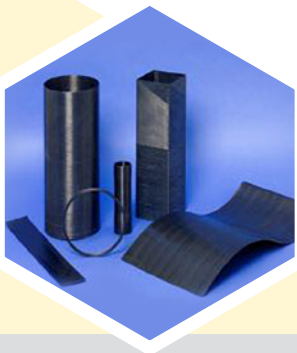
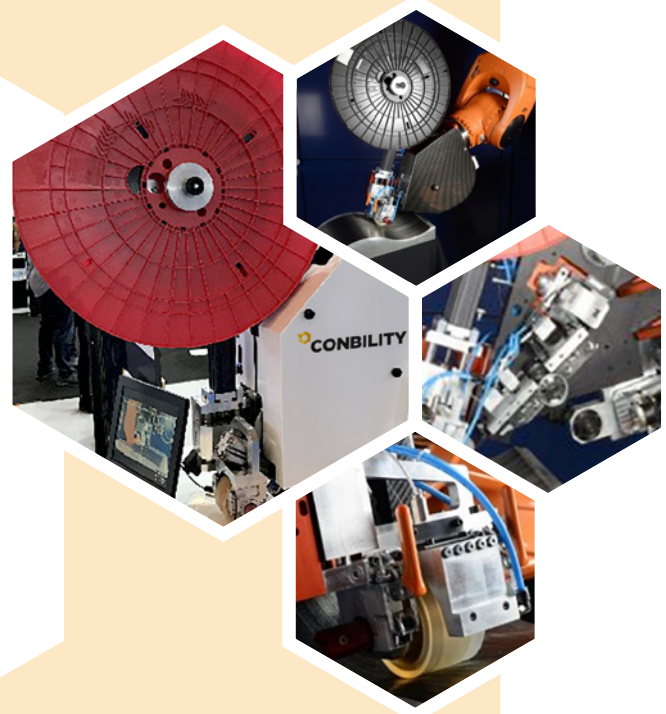
Automated 2D thermoplastic tape placement with in-situ consolidation:

- IR heating system (optional: laser system)
- Waste minimization by "Cut-and-Add-on-the-Fly"
- Table diameter: 1200 mm (or 2000 mm)
- Machine dimensions: 5 m × 2 m (or 6 m × 2.8 m)
- Max. speed: 1 m/s (typical process speed for PA-tape: 250 mm/s)

»PrePro 3D« Modular Applicator

Automated 2D and 3D tape placement and winding with in-situ consolidation:

- Laser heating system (optional: IR system)
- One investment for the processing of 3 different materials:
 - Thermoplastic CFRP and GFRP Tapes
 - Thermoset CFRP and GFRP Prepregs
 - Dry Fiber Rovings
- Tape tension and laser power control (closed-loop)
- BECKHOFF-based decentral control system including process parameter control and HMI



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