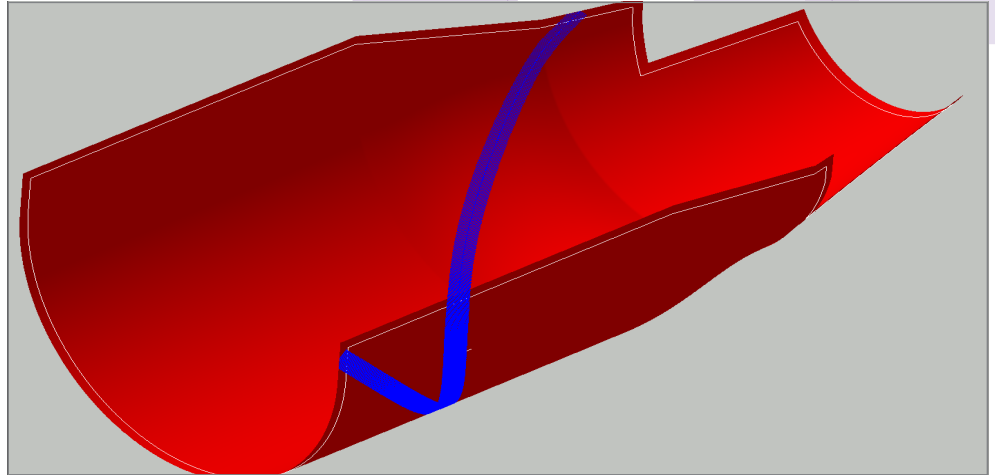# truPLAN

TruPLAN is a comprehensive software solution that makes it possible for composite design engineers to run multiple "what-if" scenarios to test the manufacturability of composite parts during both the Conceptual Design and Detailed Design Phases. TruPLAN allows manufacturers to quickly test which manufacturing process will have the biggest effects on costs and production rates.

KEY FEATURES

- Objectively Compare and Determine the Cost-Impact of Using Different Processes for Composite Part Manufacturing (AFP/ATL/HLU)

- Analyze Multiple "What-If" Scenarios and Layup Strategies at the Conceptual Design Phase

- Calculate Optimum Material Size for Fabric, Roll Stock, Tape and/or Tows

- Analyze and Optimize Various Material Deposition Strategies

- Increase Overall Process Efficiency Based on Various Optimization Engines

- Evaluate and Optimize Material Bridging, Steering, and Angle Deviation Issues

- Optimize Stacking in Terms of Production Rates and Facility Requirements

- Assess Different Facility Layouts to Reach Optimum Cost/Production Rates

TruPLAN Enables Manufacturers to Evaluate the Impact of Design Concepts on Downstream Manufacturing Processes

TruPLAN is based on multiple advanced optimization algorithms and assesses the cost-impact of unique design features and surface definitions across multiple manufacturing processes, such as: Automated Fiber Placement (AFP), Automated Tape Laying (ATL), Hand Layup (HLU) or any combination of these strategies. First, TruPLAN allows manufacturers to see if a part can even be produced; and second, TruPLAN provides objective data that highlights the manufacturing strategy or combination of strategies that tests show to be the most cost-effective based on material size, throughput, facility requirements, etc.

TruPLAN provides everyone - from design engineering to management - the statistical data necessary to evaluate the impact of various design concepts against various manufacturing processes. TruPLAN analyzes composite parts to determine greatest ROI and factors in various commercial issues - like weight, fuel efficiency, competitive advantages, and market acceptance - and manufacturing costs – like, capital investments for new equipment, the use of less efficient existing equipment, and the required levels of production throughput.

TruPLAN lets composite manufacturers anticipate the costs of fabricating a certain part and also optimize their entire process to avoid re-engineering and downtime on the shop floor. The data collected by TruPLAN enables engineers to perform comparative cost-benefit analyses to determine optimum materials, processes, and equipment.

Composite manufacturing is evolving quickly and much of the history usually used to make manufacturing decisions simply is not there. The data collected in TruPLAN provides manufacturers with accurate and reliable data to serve as a guide toward the most cost-effective manufacturing process in seconds and minutes; not months and years!

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truFIBER

TruFIBER is a robust programming suite designed to support multiple composite manufacturing processes such as Automated Fiber Placement (AFP), Tape Laying (ATL), Hand Layup (HLU), In process Quality Assurance (IPQA) and Ply Compensation (TPC) for cured composite part thickness control. Based on statistical information provided by TruPLAN, users of TruFIBER can select the necessary programming module(s) required. TruFIBER offers a single environment to manage and program many composite processes. If multiple processes are required, such as nesting and laser projection for HLU along with an AFP process, TruFIBER will generate a single output file that synchronizes and includes all the necessary code for each process rather than maintain unique programs for each.

Hand Layup (HLU)
TruFIBER's HLU module capitalizes on Magestic Systems' proven expertise in automatic ply nesting and laser projection. TruFIBER for HLU will generate the code necessary to cut and label the nested plies in the most efficient manner, as well as generate the code to drive the laser projector(s) for accurate layup and optional ply kitting.
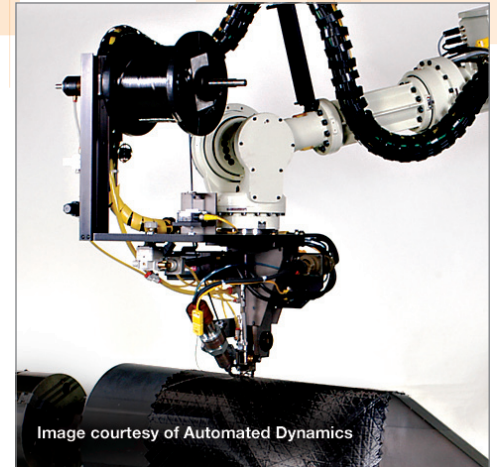
Automated Fiber Placement and Tape Laying (AFP/ATL)
TruFIBER's AFP/ATL module will generate the code necessary to drive both AFP and ATL machines whether they are robotic or gantry systems. The AFP/ATL module has the capability to optimize tool paths for fiber placement taking into account material bridging, steering, angle deviation and tension to ensure that material deposition is accurate and efficient. TruFIBER is completely machine-independent and has the ability to generate code for any laser projector, cutting machine or AFP/ATL machine.

TruPLY Compensation (TPC)
TruPLY Compensation is part of the award-winning Cured Laminate Compensation process that has given composite manufacturers another option for serial production of critical composite parts. Current methods require adding sacrificial plies and machining the part down into engineering specifications. TruPLY Compensation allows manufacturers to build up to the nominal levels of material and add non-structural compensation plies to ensure that the thickness of mating surfaces matches the intended design.

In Process Quality Assurance (IPQA)
TruFIBER's IPQA (In Process Quality Assurance) module enables Quality engineers the ability to compare "Theoretical" manufacturing intent to the "As Built". Crucial parameters like maximum fiber angle deviation, material steering, bridging, gap/overlap etc…can be easily inspected for accuracy using laser technology on the actual parts and stored in an inspection report allowing a full layup certification process. IPQA has the ability to generate code for laser projector(s) to perform a quality inspection process in any moment of the layup process.

A Full Scale Composite Manufacturing Suite for AFP, ATL, AHL, Ply Compensation, & IPQA

Image courtesy of Automated Dynamics

KEY FEATURES

- Generic Platform and Machine Brand Independent
- Optimize Material Bridging, Steering, Angle Deviation, and Tension
- Accurate Collision Checking and NC Code Validation
- Advanced Layup Strategies for Unidirectional Material and Large Woven Fabric Tapes
- Supports AFP/ATL/AHL/TPC/IPQA Programming from a Common Software Suite
- Generate Statistical Reports for Material Efficiencies and Process Time
- Process Zones Empower the Programmer to Use Different Layup Parameters
- Leverages Industry-Proven Nesting and Laser Projection Capabilities

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