SIEMENS
Ingenuity for life

Fibersim 17

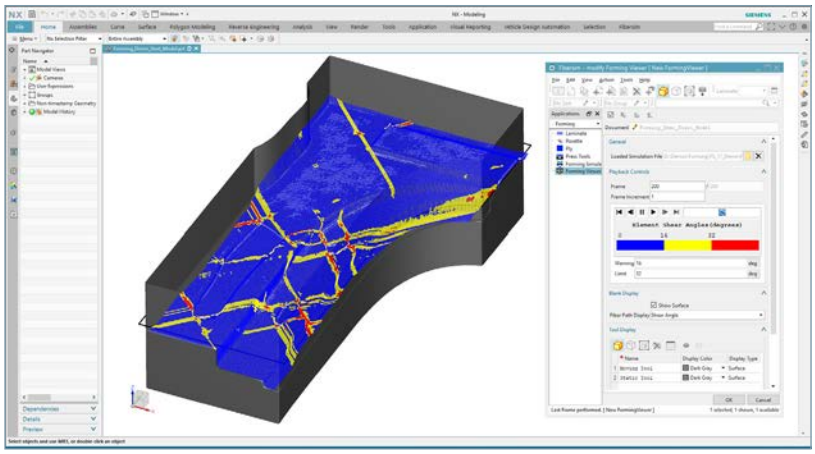
Narrowing the number of design concepts for in-depth forming analysis

Benefits

- Quickly reduce number of viable design concepts for further in-depth forming analysis
- Provide unambiguous, visually pleasing composite cross-sections for all components and part shapes
- Leverage planar cross-sections to offer a complete functional replacement for legacy 3D cross-sections with more natural and intuitive results
- Enable the digital thread for composite details and expose ply data to the enterprise
- Deliver full support of manufacturing laminate workflow for all part types
- Use parametric transition splitter to unleash the full power of the multi-ply design workflow

Summary
Enhancements to the latest version of the Fibersim™ portfolio (17) include forming for designers, planar cross-section improvements, publish to Teamcenter® software capability and explicit layer splicing. These improvements build on the addition of the parametric zone transition splitter introduced in Fibersim 16.1. With these enhancements to Fibersim 17, users will find a quicker path to composite forming, a more intuitive option for viewing planar cross-sections through the midplane of a ply, exposure of composite details and ply data to the enterprise, full support of manufacturing laminate workflow for all part types and a more robust multi-ply workflow. This update makes Fibersim an enterprise integrated tool with forming, planar cross-section and splicing capabilities, which places it at the forefront of the industry.

Forming for designers
Fibersim 17 introduces forming for composite designers. Forming within Fibersim can now be used for refining parts and tool shapes to make them more viable for forming. This is made possible by the quick and reliable feedback within the computer-aided design (CAD) space, similar to the Fibersim classic producibility simulation for hand-laid parts. Now designers as well as computer-aided engineering (CAE) users can use this tool to filter part and tool shapes down to a select few options, providing significant time savings compared to more traditional methods.



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Features

- Quickly assess producibility of numerous formed part design concepts
- Support for core, wrapped plies and closed base curves expand planar cross-sections to all part types
- New profiles such as shading and style options like schematic provide a composite cross-section for any situation
- Can publish Fibersim laminates, plies and cores to the composite object model in Teamcenter 12.3 from NX and CATIA
- Flexibly define any splicing strategy for a given layer while maintaining associativity to the engineering definition
- Remember the design intent behind split transitions to enable robust and rapid response to change

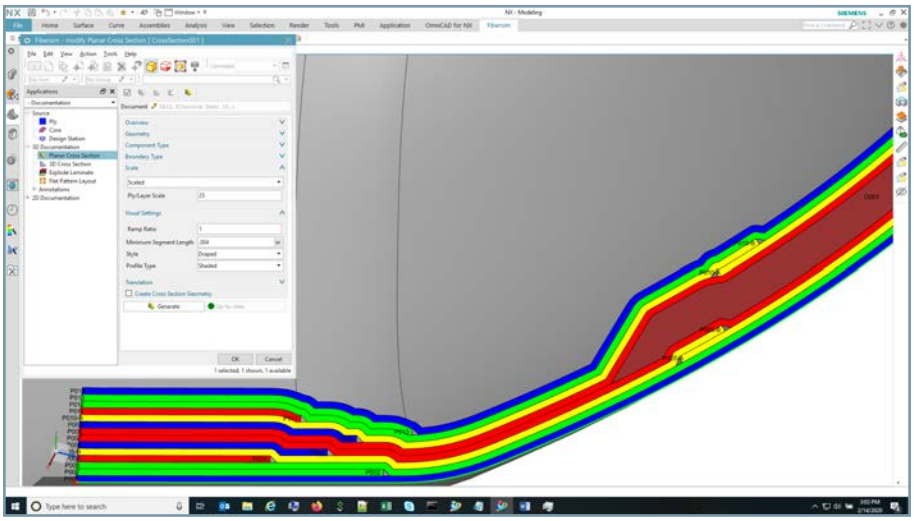
Planar cross-section – core and wrapped ply support

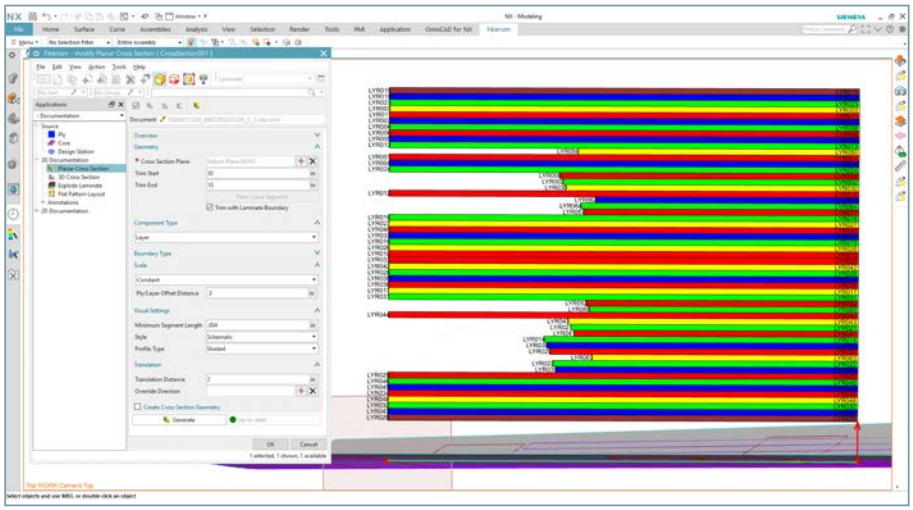
Fibersim 17 brings support for core and wrapped plies to planar cross-sections.

With its novel approach to drawing core sections, planar cross-sections produce vastly improved visual representations of core panels over the legacy 3D cross-sections. Using straight-line ramps for virtual cores and accurate area computation for modeled cores provide clean and smooth results. Adding in wrapped ply support elevates planar cross-sections for use in any part type with any set of composite components.

Planar cross-section: new profile and style options

Fibersim 17 adds two new profile types to planar cross-sections in addition to the remaining style options that were on legacy 3D cross-sections. Due to the complexity of modern composites, cross-sections are a critical medium for communicating design intent. Depending on customer requirements or the specific element to be communicated, it is imperative that a wide array of options be at the designer's disposal when generating these sections. The shaded profile produces an





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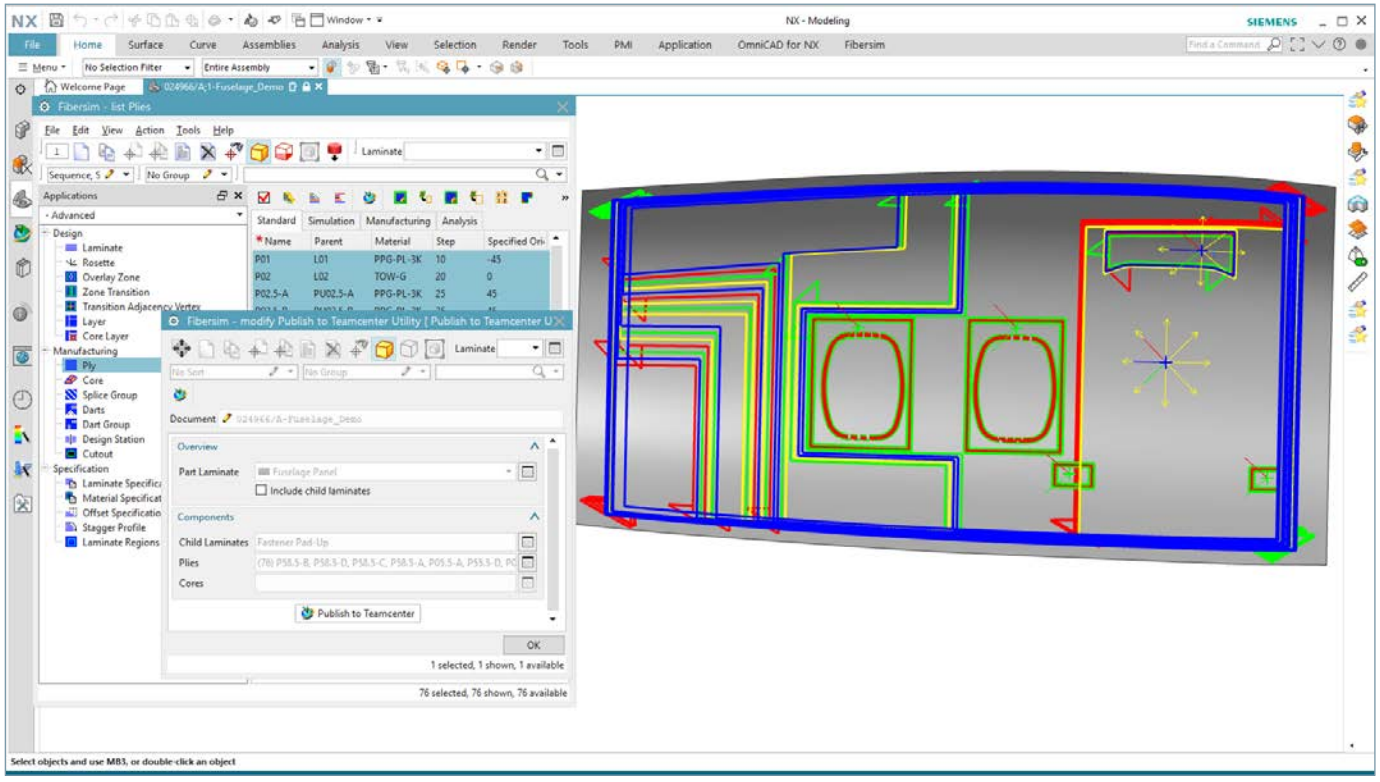
unambiguous section that clearly represents plies in a stackup, while the centerline profile provides a new intuitive section through the midplane of a ply without the weight of shaded surfaces. The addition of the schematic style allows better communication of the staggering across a ramp area, and the constant scaling and translation provide additional tools for specific scenarios. With these additions, planar cross-sections now have the full breadth of capability to set the industry standard for composite cross-sections.

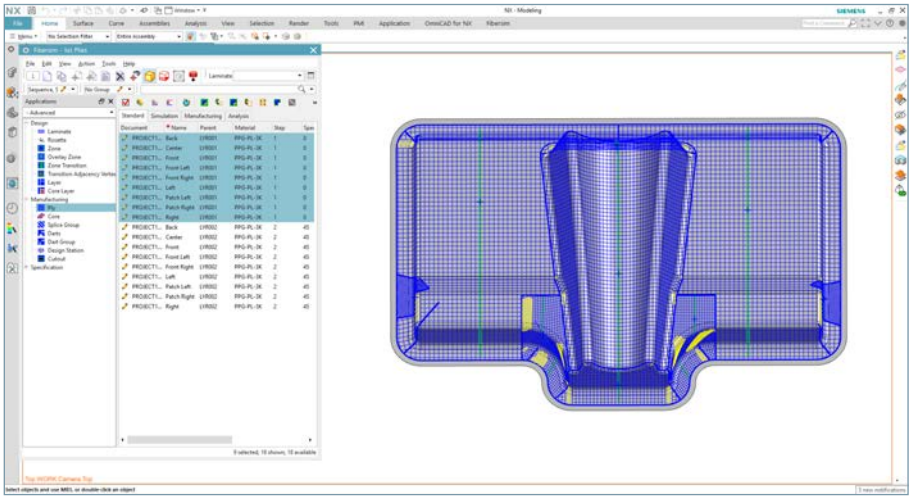
Publish to Teamcenter

Fibersim 17 introduces the ability to publish the laminate definition of plies and cores to Teamcenter.

Traditionally, composite parts are modeled entirely within the CAD model, and pertinent details such as weights, flat patterns and manufacturing outputs are prepared for export by Fibersim. This meant consumers of this data would need to load up a CAD model and Fibersim to access ply details.

By pairing Fibersim 17 with Teamcenter 12.3, the complete composite structure of laminates, plies and cores can be exposed to the enterprise via the Teamcenter composite object model. This allows for downstream access to ply information directly from Teamcenter, without having to open up the CAD system to create a digital thread throughout the entire enterprise.



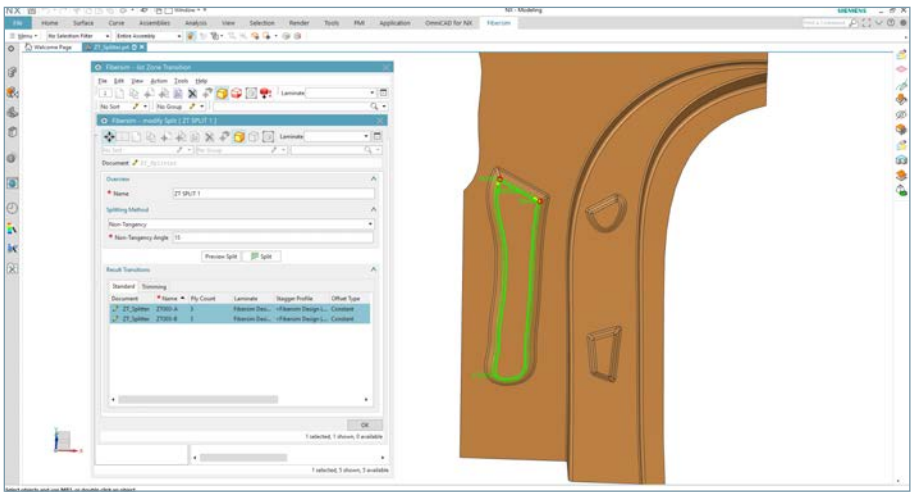


Explicit layer splicing
Fibersim 17 introduces explicit splicing of layers using CAD curves. The Fibersim layer design workflows provide natural segregation of design and manufacturing while maintaining a link to the design intent. However, the only way to maintain that link for layers that must be split into multiple plies requires the use of splice groups, which provide excellent automation but also come with some geometric limitations. With Fibersim 17, users can manually splice layers into any number of ply shapes using explicit CAD curves. This provides flexibility for defining any spliced ply shape with the benefit of maintaining the associativity to layer-based design intent. In particular, this allows full support of the manufacturing laminate workflows that have been widely adopted by Fibersim customers.

Parametric zone transition splitter
Fibersim 17 introduces an overhaul to the zone transition splitter capability. The zone transition splitter allows a designer to divide a single transition into multiple transitions to provide more fine-tuned control over layer drop-off behavior. In previous releases, there was no tracking of the design intent that dictated how a given transition was split, which meant geometric changes to the underlying zone shape could cause the split location to move, thus requiring a manual re-creation of the split.

With Fibersim 17, this legacy operation has been replaced with a parametric transition splitter that preserves the original definition and the method of splitting. This eliminates manual rework to accommodate design changes and greatly improves efficiency when working with split transitions.

This feature unlocks the full potential of the multi-ply design methodology when the ability to split zone transitions using geometric inputs such as non-tangencies is a market differentiator.



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