

Recent Updates – CAD Export

CAD Export

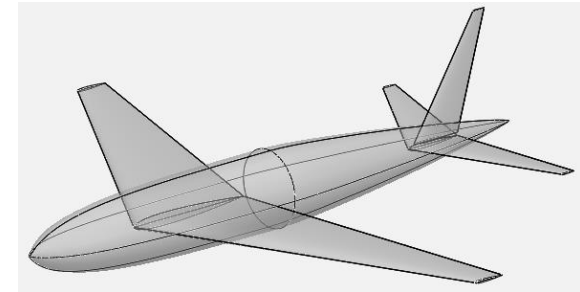
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Overview:

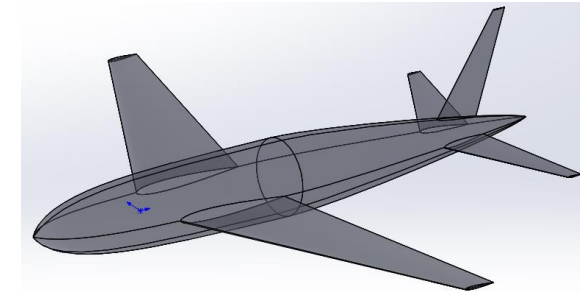
- Water-tight geometry export – components are intersected and trimmed
- Streamlines interface with external meshing tools – no need for manual trimming
- Focus on STEP and IGES file formats
 - BREP solid representation for STEP
- Support for the following entities:
 - FEA Parts (structures)
 - Transparent surfaces (disks and wakes)
 - Negative volumes
 - Sub-surfaces (limited)

Trimmed vs Untrimmed Exports:

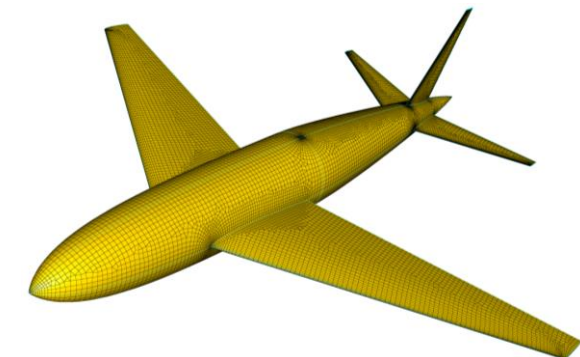
- Untrimmed: File -> Export... -> Untrimmed *format*
- Trimmed:
 1. Surfaces: Analysis -> Trimmed Surfaces... -> Intersect and Export
 2. Structures: Analysis -> FEA Mesh... -> Export CAD



Untrimmed OpenVSP Model



Trimmed STEP Export

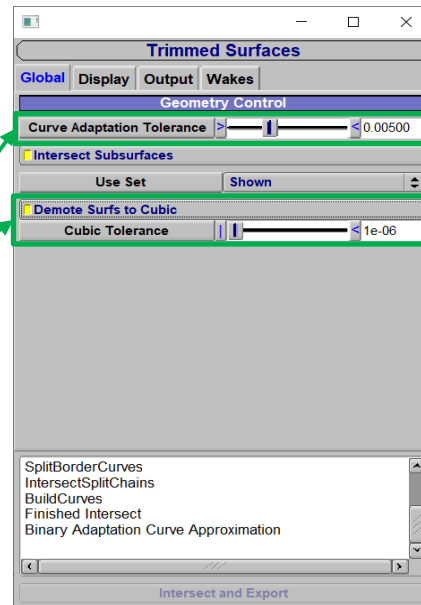


Pointwise Automated Mesh

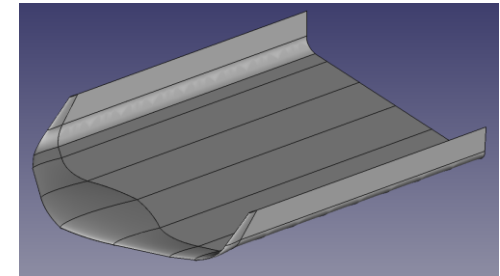
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Released in 3.22.0:

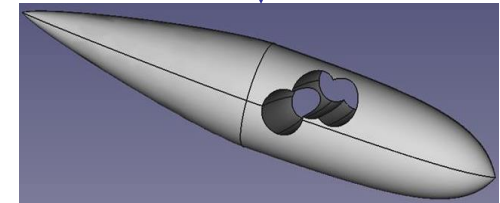
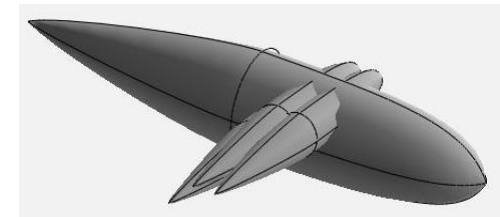
- Minor untrimmed CAD export GUI improvements
- Added labels missing in untrimmed STEP structure files
- Additional user controls:
 - Binary adaptive refinement tolerance: number of points to approximate intersection curves
 - Cubic surface demotion option: surfaces demoted before intersection – not promoted
- Improved option to exclude OML from FEA Structure export
- Miscellaneous bug fixes



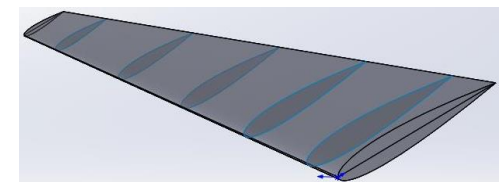
Leave as default unless
problems occur



Multi-section Blended Wing Wake



**Negative Volumes ->
Trimmed CAD Export**



Trimmed Structural Model

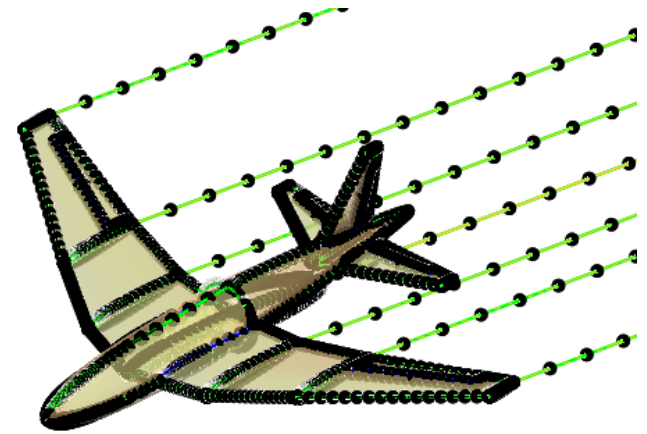
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Current Limitations:

- FEA Parts trimmed against skin, but skin not broken at intersections
- Intersections between FEA Parts, transparent surfaces, and sub-surfaces exported as surface curves – surfaces are not broken

Best Practices:

- Start simple and work up to higher complexity
- Avoid difficult surface intersection calculations:
 - Coplanar/overlapping surfaces – infinite intersections
 - Tangent surfaces – singular intersection
- Check VSP terminal for error messages
- Issues may be resolved by small adjustments in positioning
- Decrease binary adaptive curve tolerance to increase number of control points on each intersection curve
- If possible, turn symmetry off for structural models to avoid FEA Part intersections
 - i.e. Spar on a symmetric wing
- Consider trimmed CAD even with just one Geom in the export set
 - Better connectivity between surfaces



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Demo

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Questions?