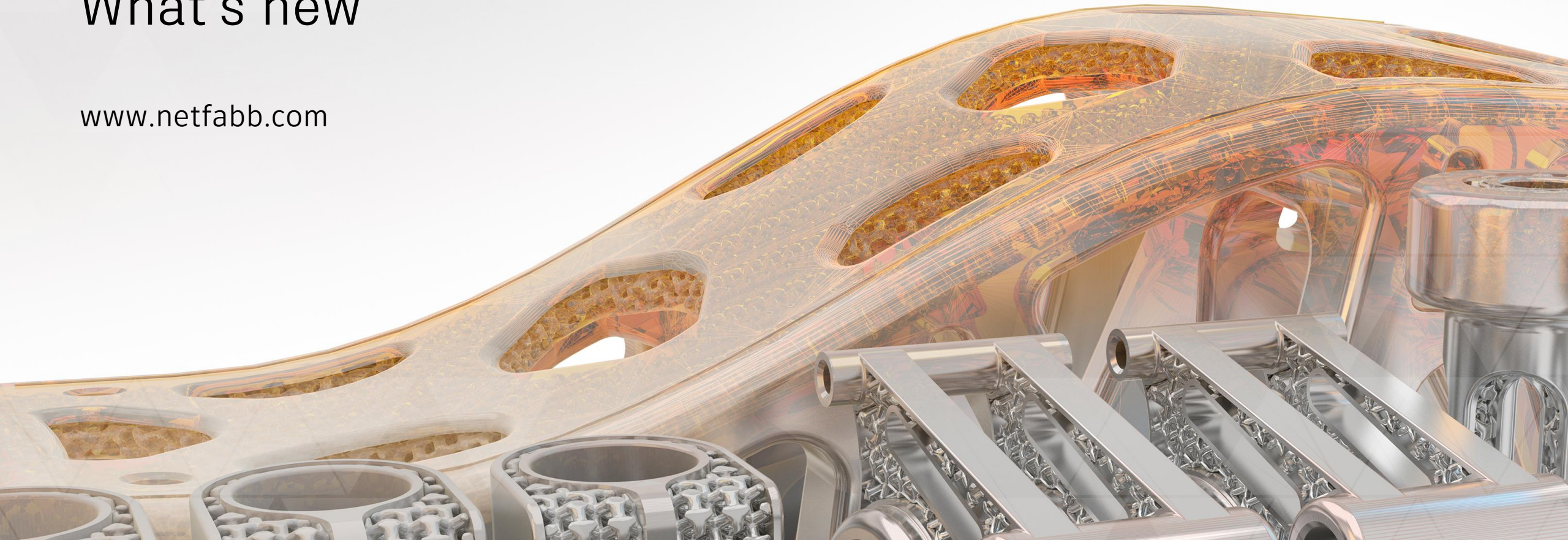


June 2017

Autodesk® Netfabb® 2018

What's new

www.netfabb.com



What's New in Netfabb 2018



Maximize machine efficiency & throughput

Automation, parametric supports, & interoperability

Design for additive manufacturing

New latticing toolkit and improved topology optimization

Minimize risk & cost of print failures

Export compensated shape, stress results & more control

Efficient prep for CNC finishing

Dynamically edit Superstructures and Flexistock

Maximize Machine Efficiency

Netfabb

Part orientation module & support preview

Netfabb Standard

What is it?

The 'Orient Part' features analyzes parts, displays a preview of support structures, and provides suggestions with regard to:

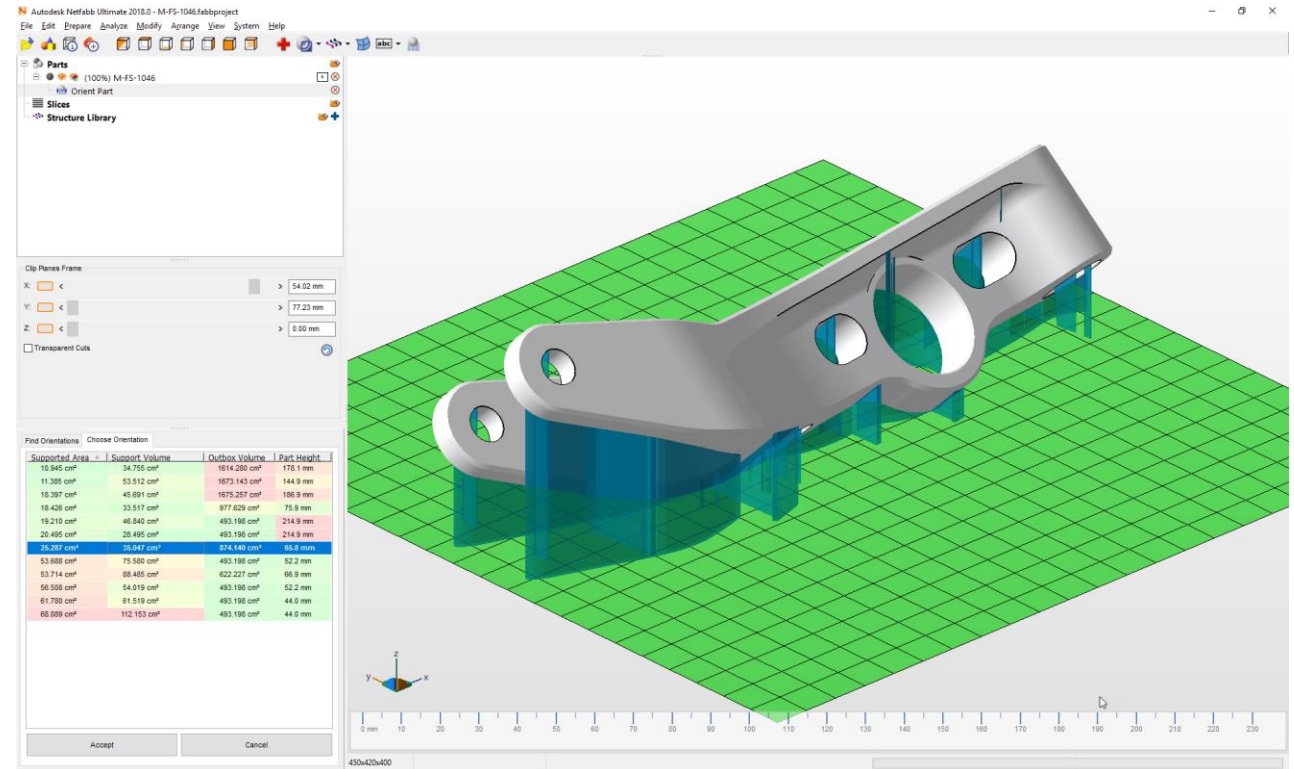
- ▶ Supported area & volume
- ▶ Outbox volume
- ▶ Part height

Why use it?

Minimize supports, reduce finishing effort, and reduce the learning curve for new operators.

How to use it?

Open Arrange > Orient Part from the main menu.



Pins & holes while cutting

Netfabb Standard

What is it?

The 'Automatic Pin Creation' function generates cylinder or hook pins and holes when splitting parts.

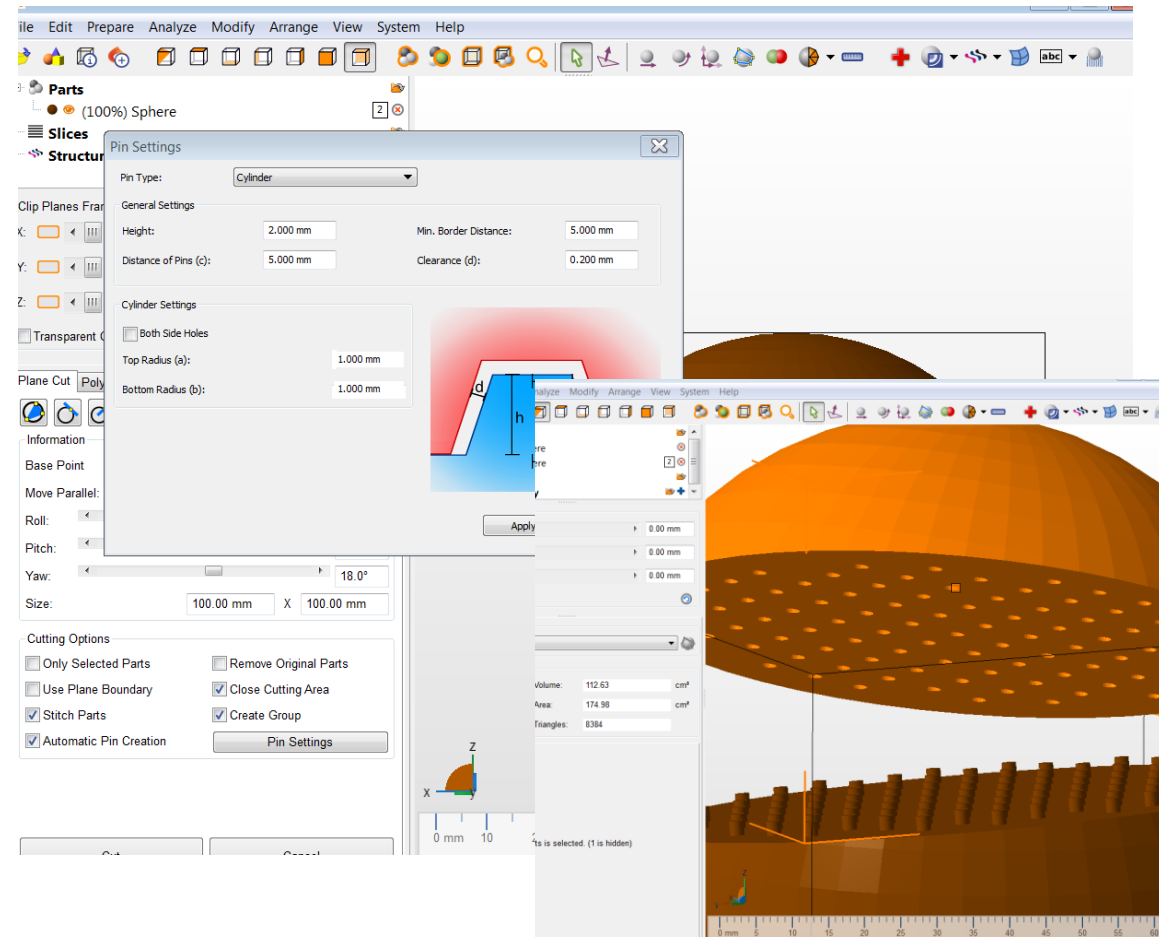
Why use it?

Easier reassembly process with proper alignment between parts.

How to use it?

In the 'Cut' panel, select 'Automatic Pin Creation'.

Open Pin Settings dialog to customize pin type, sizing, and spacing.



UX refinements

Netfabb Standard

What is it?

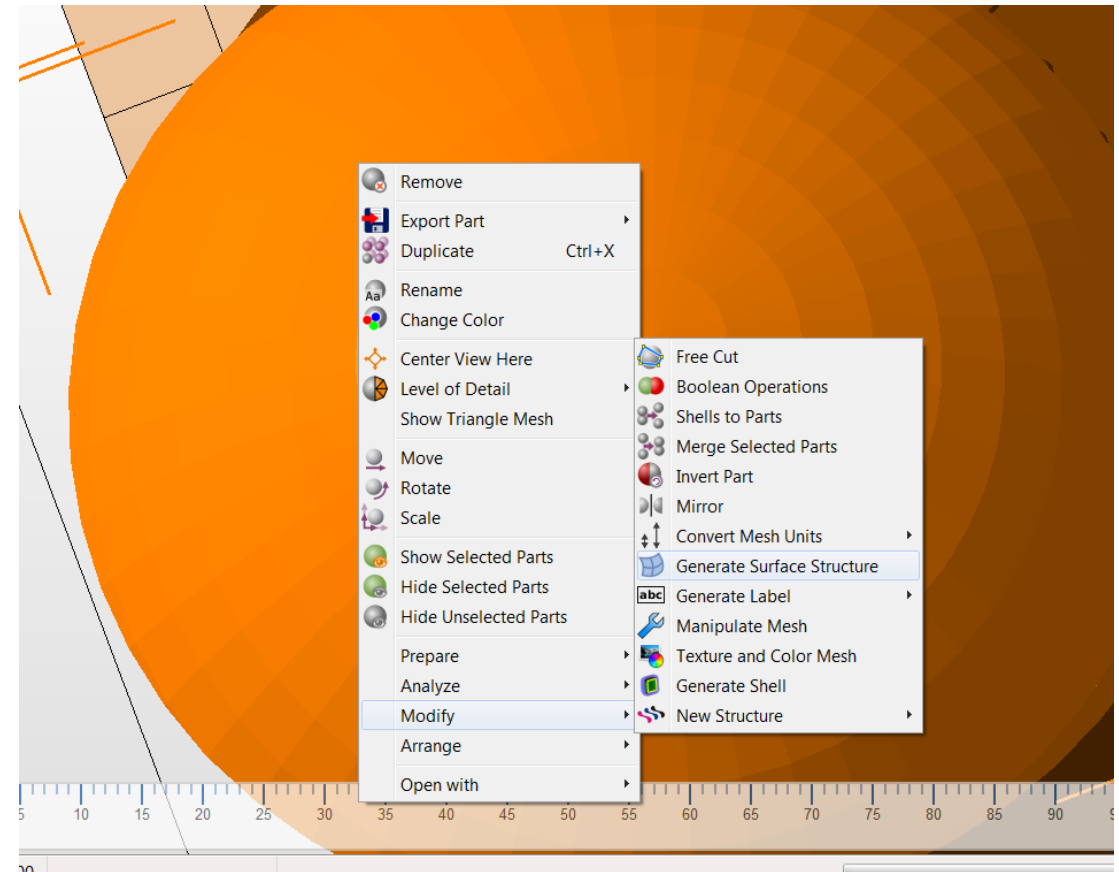
Restructured main menu and context menu along with more clearly named categories.

Why use it?

Easier to find the command you need, when you need it.

How to use it?

Use the main menu or open the context menu.



Parametric support structures

Netfabb Premium

What is it?

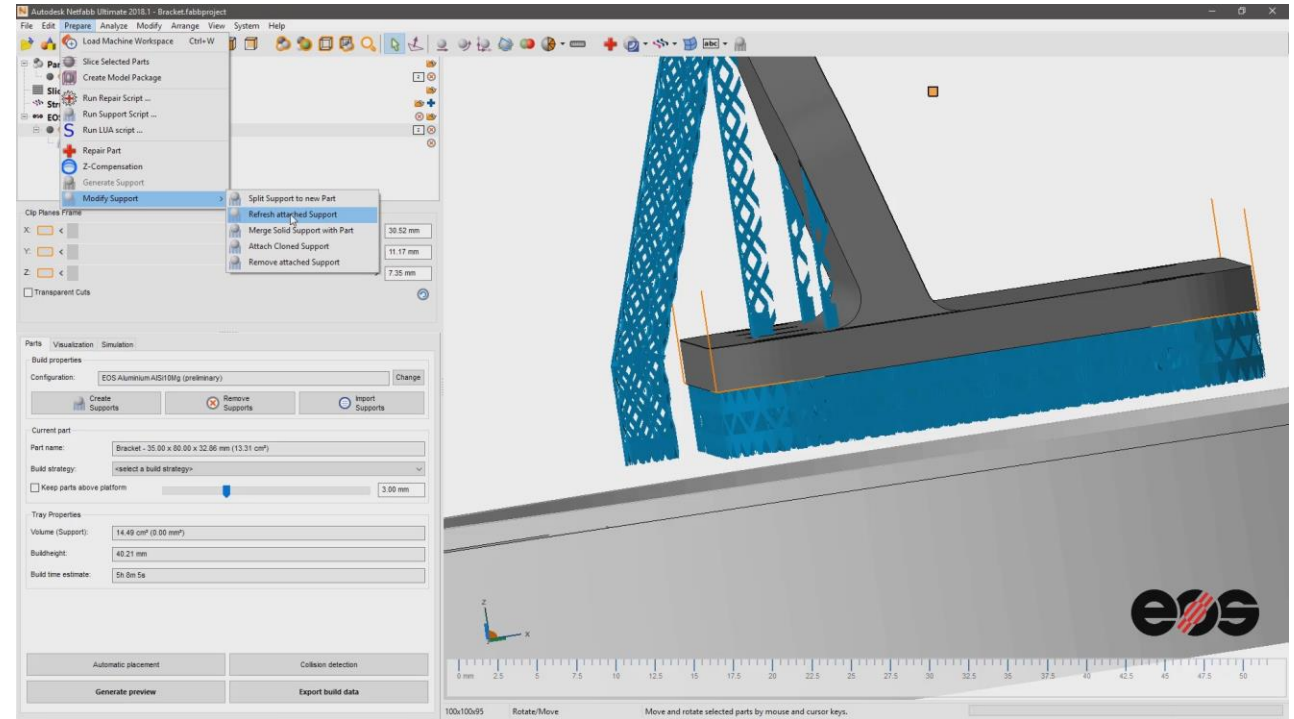
Support definitions are stored so supports can be automatically updated due to changes to orientation, assembly, or geometry.

Why use it?

Eliminate rework time deleting and redefining support structures.

How to use it?

In the Prepare>Support menu, select 'Recalculate Attached Support.'



Parallel support creation

Netfabb Premium



What is it?

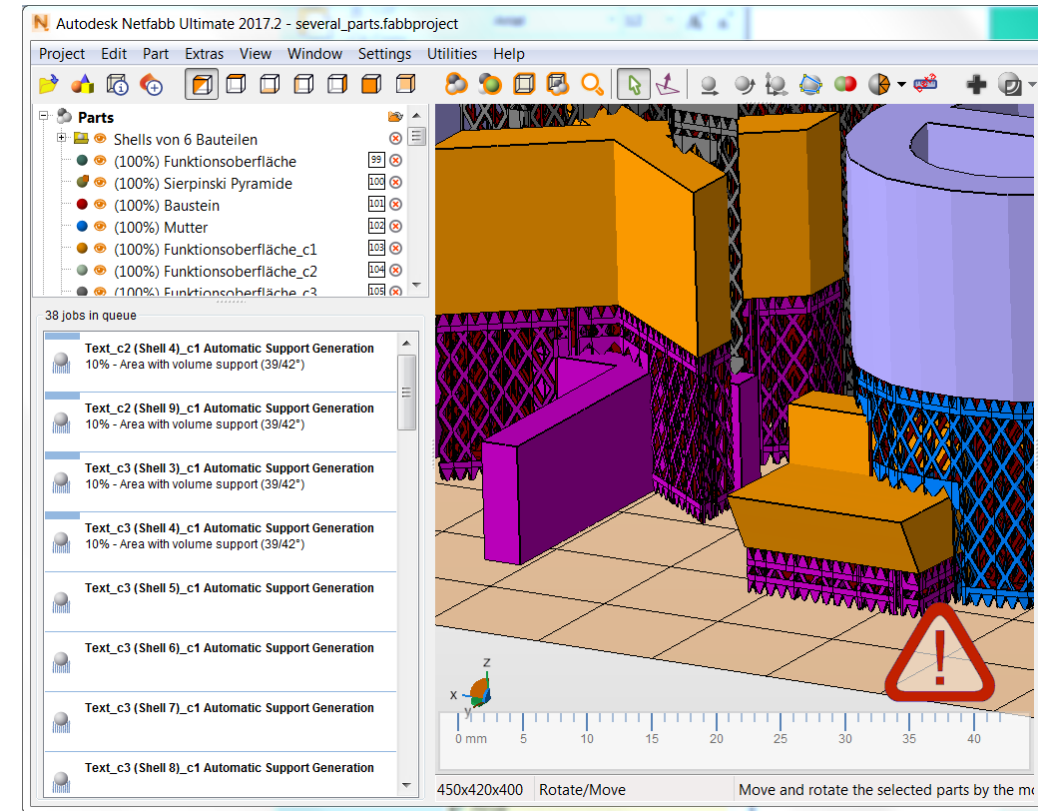
Assign different, custom support strategies to parts or sets of parts and use a queue to track progress.

Why use it?

Background calculation of supports allows for faster support creation for multiple parts that require unique approaches.

How to use it?

View job manager to monitor support creation progress.



Angled supports

Netfabb Premium

What is it?

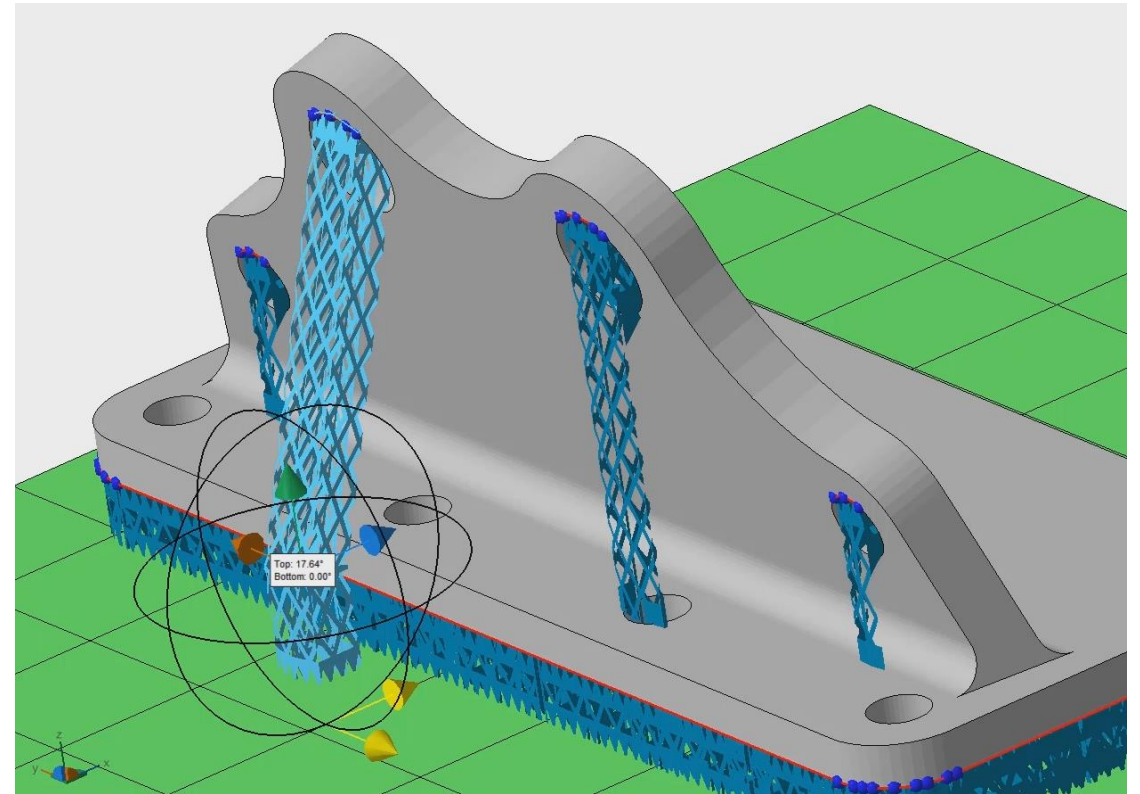
Angled supports project outside the part to the print platform.

Why use it?

Reduce the cost and time required for post-printing finishing efforts by avoiding part-to-part support structures.

How to use it?

Select 'Angled block support' from the support creation dialog.



Faster 3D packing

Netfabb Premium

What is it?

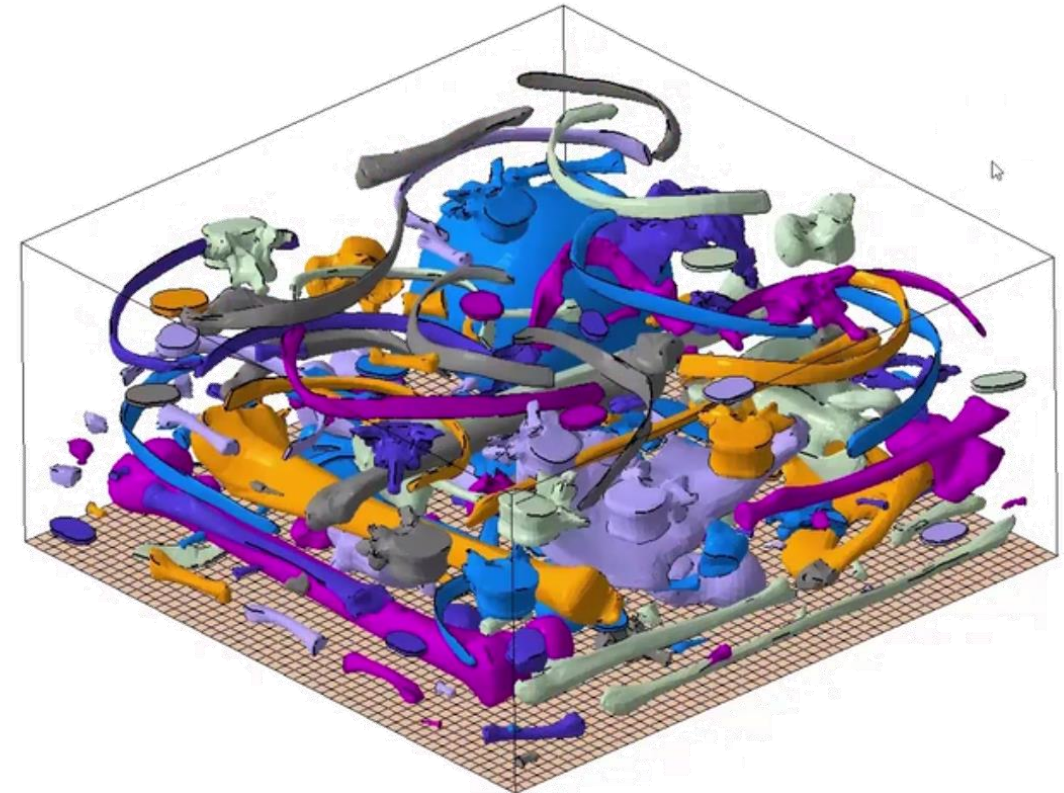
A new multi-level penetrating algorithm for the Monte Carlo packer.

Why use it?

Reduce 3D packing time for certain configurations by as much as 30-50% compared to previous versions.

How to use it?

No change, algorithm improvements are implemented in the existing 3D Packing capability.



Extended automation

Netfabb Ultimate

What is it?

LUA scripting is an development environment for automating Netfabb functionality.

Example scripts have now been added for common workflows.

Why use it?

Prepare builds faster by automating tasks that are repetitive or common across projects.

How to use it?

Example scripts are in the Netfabb installation folder under Examples\Lua Scripts.

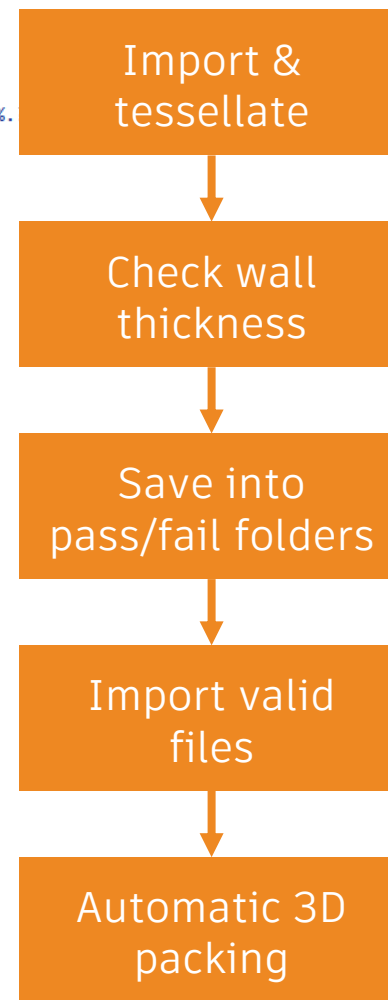
[LUA Scripting Reference](#)

```

9
10 function loadfile (filename)
11     path,file,ext = string.match(filename, "(.-)([^\W]-%.)")
12     ext = ext:lower()
13     system:log(ext)
14     if ext == "stl" then
15         system:log("stl")
16         return system:loadstl (filename)
17     elseif ext == "3ds" then
18         system:log("3ds")
19         return system:load3ds (filename)
20     elseif ext == "3mf" then
21         system:log("3mf")
22         return system:load3mf(filename)

```

Example script workflow:



Advanced Toolpath Utility

Netfabb Ultimate



What is it?

A JavaScript development environment for material developers, machine manufacturers, and expert AM users to create toolpath parameter sets.

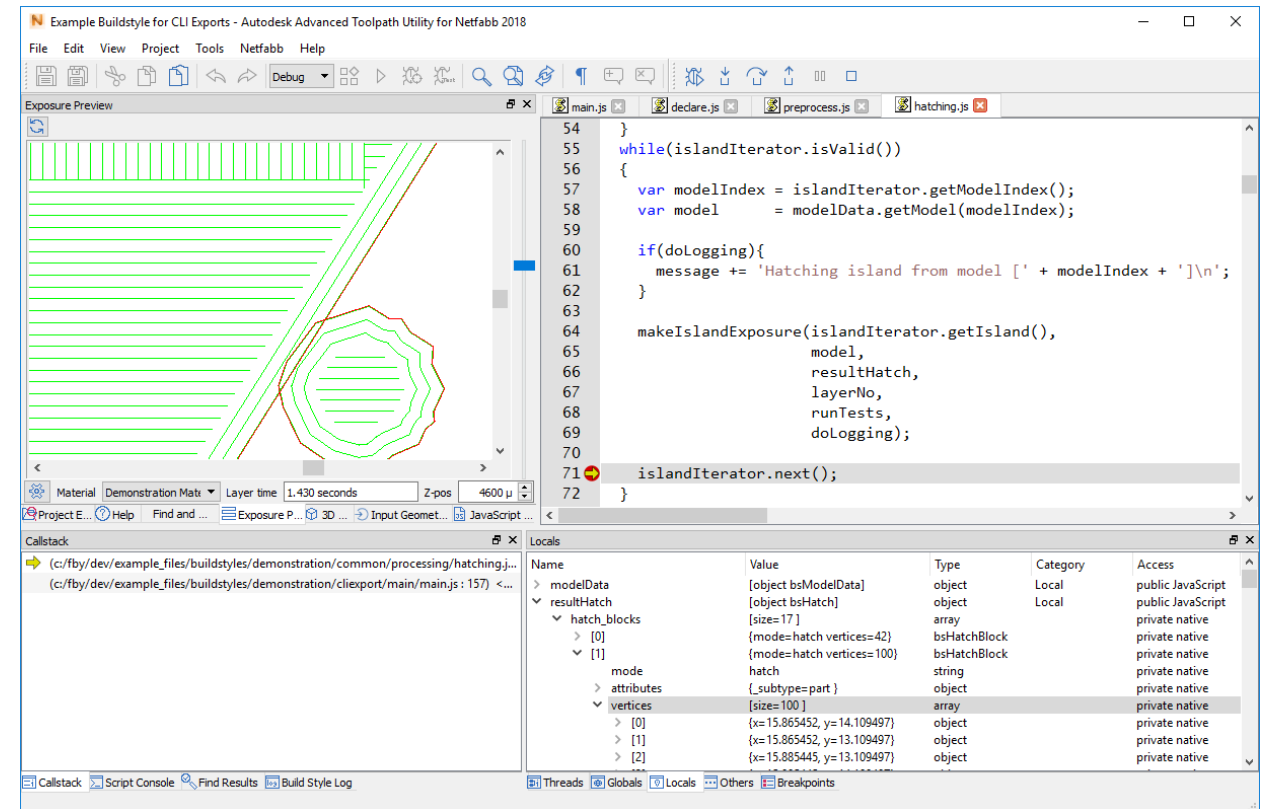
With the 2018 release an included debugging tool helps to check formal syntax.

Why use it?

More easily develop your build strategies with faster debugging.

How to use it?

Examples for CLI and SLC are available to accelerate adoption.



New machine workspaces

Netfabb Standard

Carbon



New workspaces added:

- ▶ Carbon M1 & M2
- ▶ Sinterit Lisa
- ▶ Prodways ProMaker P1000
- ▶ Rapidshape (24 machines)

Multi-head printers added:

- ▶ Titan Robotics Prometheus
- ▶ Kloner 3D 240 Twin

Fused filament fabrication enhancements

Netfabb Standard



New workspaces added:

- ▶ German RepRap
- ▶ ZYYX pro & ZYYX+

What's new:

- ▶ Faster toolpath generation
- ▶ Improved toolpath visualization
- ▶ FFF optimized supports

Design for Additive Manufacturing

Netfabb &
Optimization Utility for Netfabb

[Tech preview] Autodesk® Generative Design

Netfabb Ultimate



[Tech preview] Autodesk® Generative Design

Netfabb Ultimate



What is it?

Generative design technology takes goals set by a designer or engineer, e.g. size, weight, strength, style, materials, cost, and any number of other criteria, and then uses cloud computing to create a massive number of design solutions.

Why use it?

Explore a wide variety of valid, functional, and manufacturable designs to help reduce cost, development time, material consumption, and weight.

How to use it?

Netfabb Ultimate subscribers will be contacted directly with more information on how to access and use the technology when it becomes available later this summer.

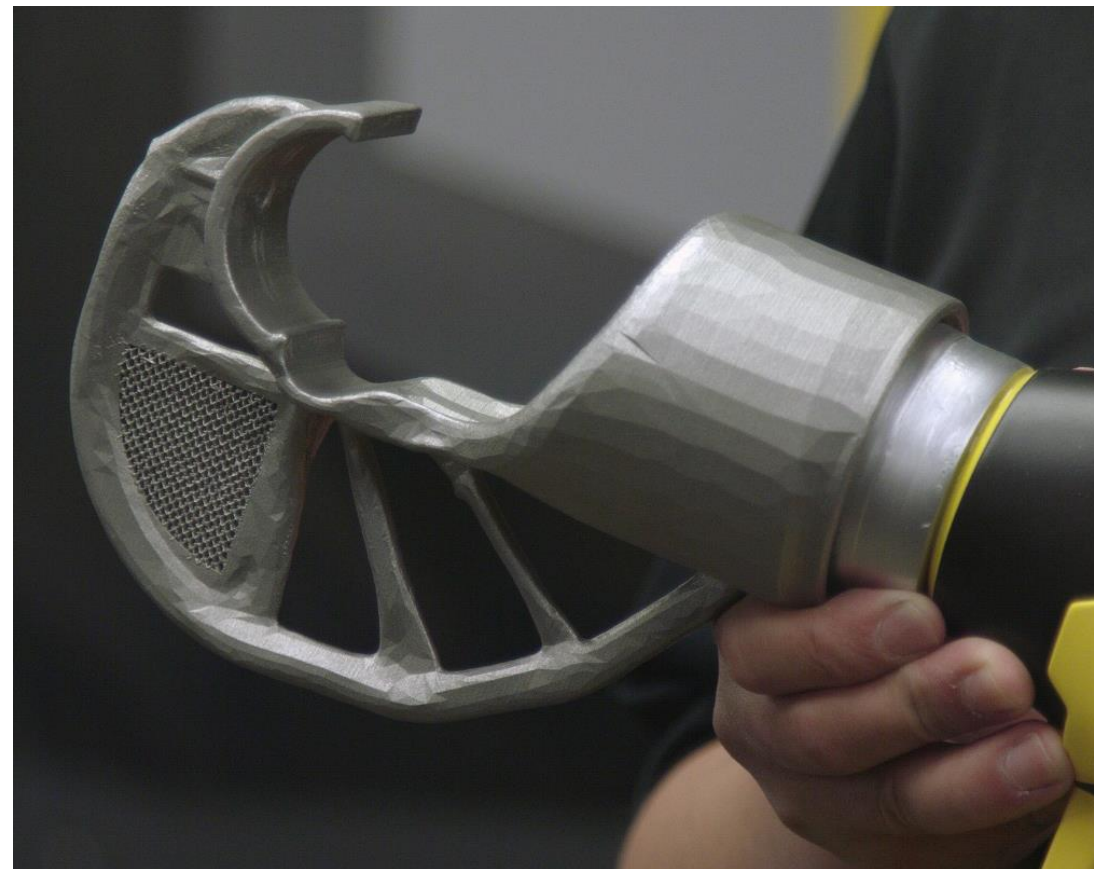


Image courtesy of Stanley Black & Decker

[Tech preview] Lattice commander

Netfabb Ultimate

What is it?

Simplified approach to generating lattice structures and skins within the core Netfabb interface. This new feature includes:

- ▶ Preview for lattice topologies
- ▶ Generation of lattice & skin meshes
- ▶ Modify lattices & skins using standard Netfabb mesh toolset

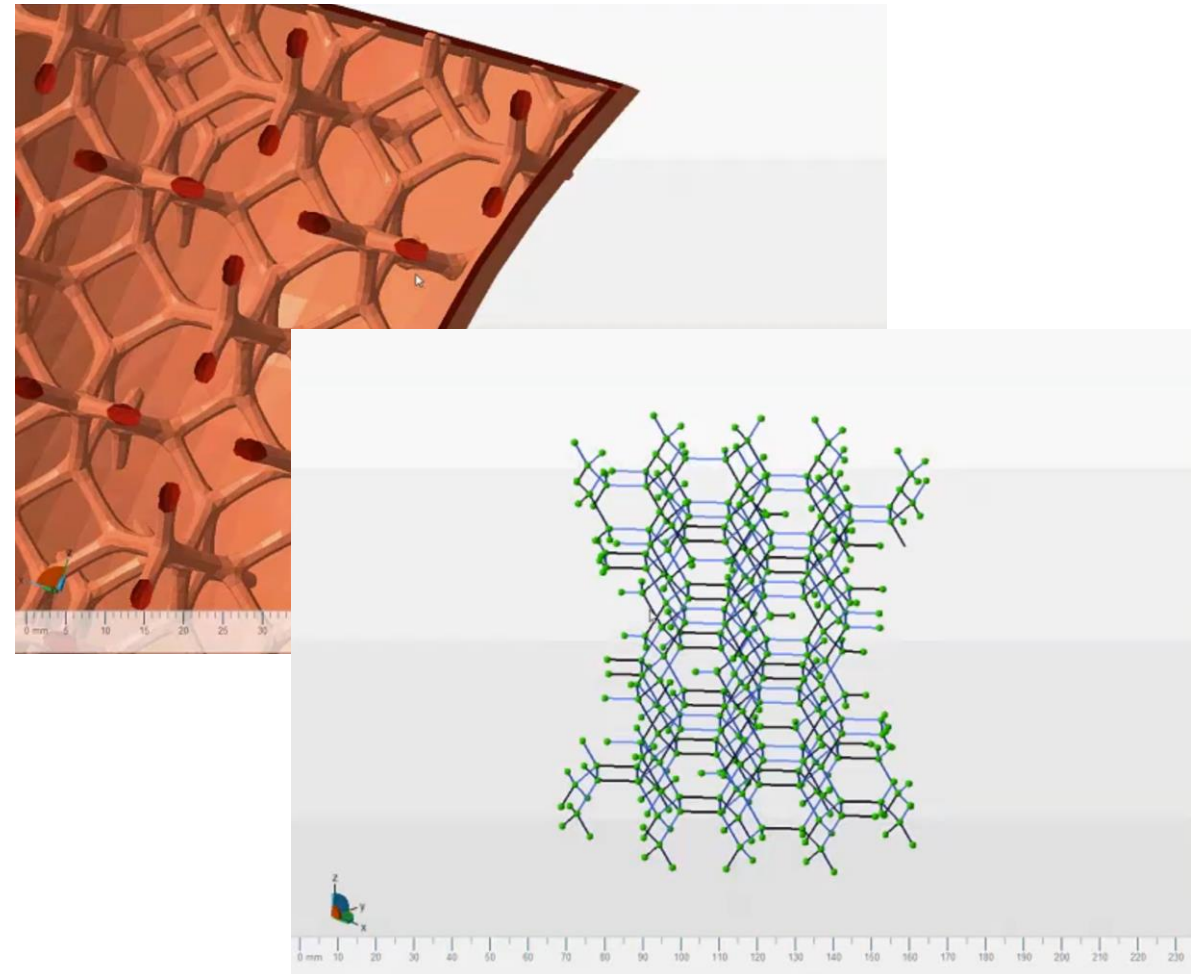
Why use it?

Create high-value designs optimized for additive manufacturing directly from the standard Netfabb application.

How to use it?

Enable tech preview from Help->Preview Opt-In

Open Lattice Commander from Modify menu.



New results for topology optimization

Netfabb Ultimate

What is it?

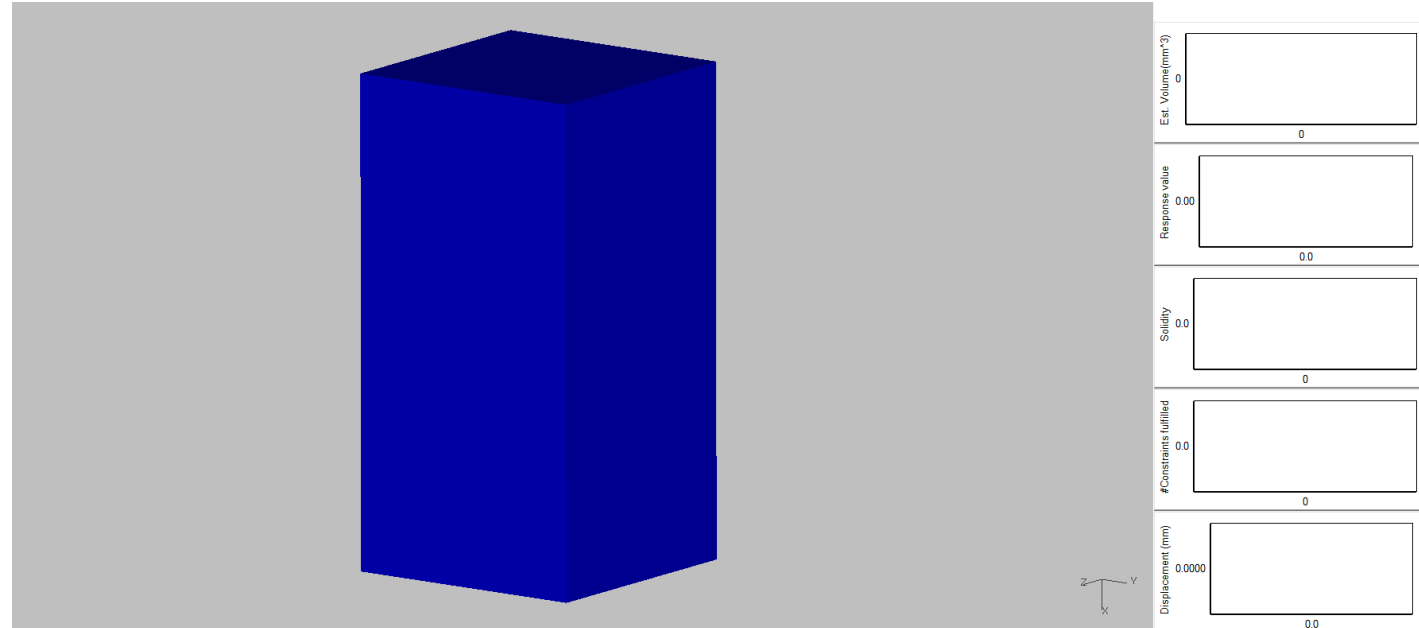
See results in 2D view graphs and display intermediate results for topology optimization.

Why use it?

View extended results for each iteration of the optimization process.

How to use it?

View intermediate results as optimization is in process.



Minimize the Risk & Cost of Build Failures

Simulation Utility for Netfabb

View simulation results for support placement

Netfabb Premium + Netfabb Simulation Solver

What is it?

Setup and run Netfabb Simulation from the Netfabb & PowerShape Utility environments and view results while placing or editing supports.

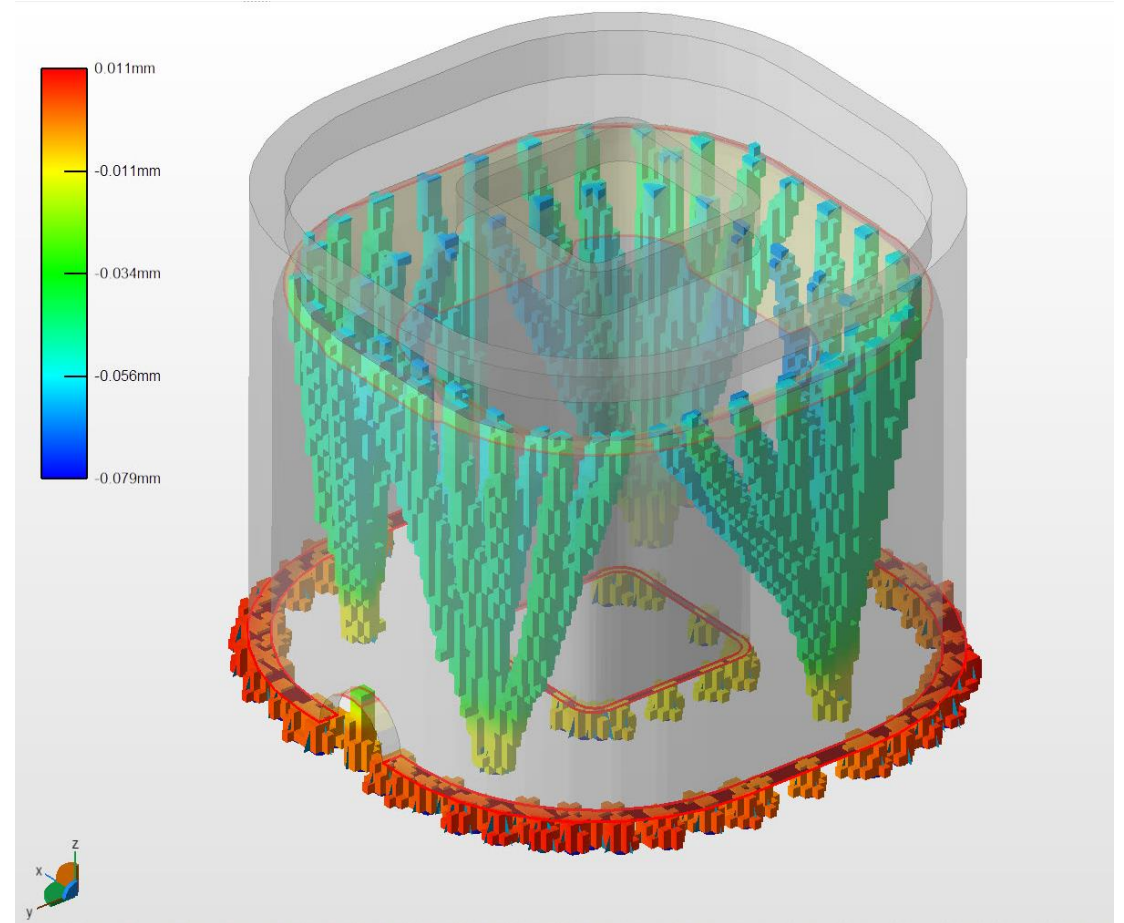
Why use it?

Reduce the likelihood of support failure by making informed decisions when placing and sizing support structures.

How to use it?

Open results file using 'View Netfabb Simulation Results' in the the Analyze menu.

Choose the time step & result type to load, then click 'Display for support editing'.



Export compensated shape

Netfabb Premium + Netfabb Simulation Solver

What is it?

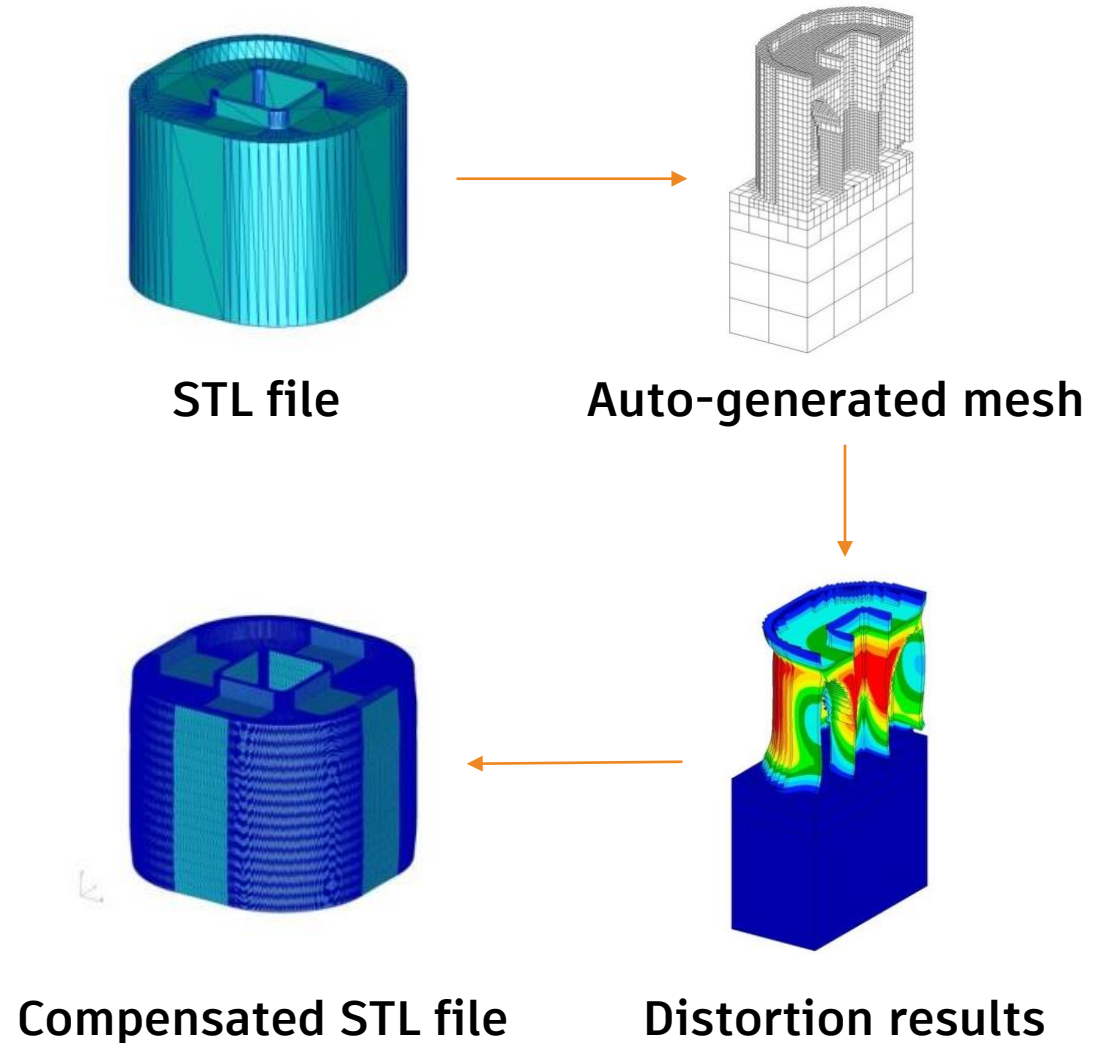
Export the compensated shape from Netfabb Simulation as an STL file.

Why use it?

Use compensated shape to counteract distortion and achieve the desired shape when printed.

How to use it?

Select 'Warped STL' from ribbon toolbar to export compensated shape.



Display stress results

Netfabb Premium + Netfabb Simulation Solver

What is it?

Output stress results from solver for post-processing. Available results include:

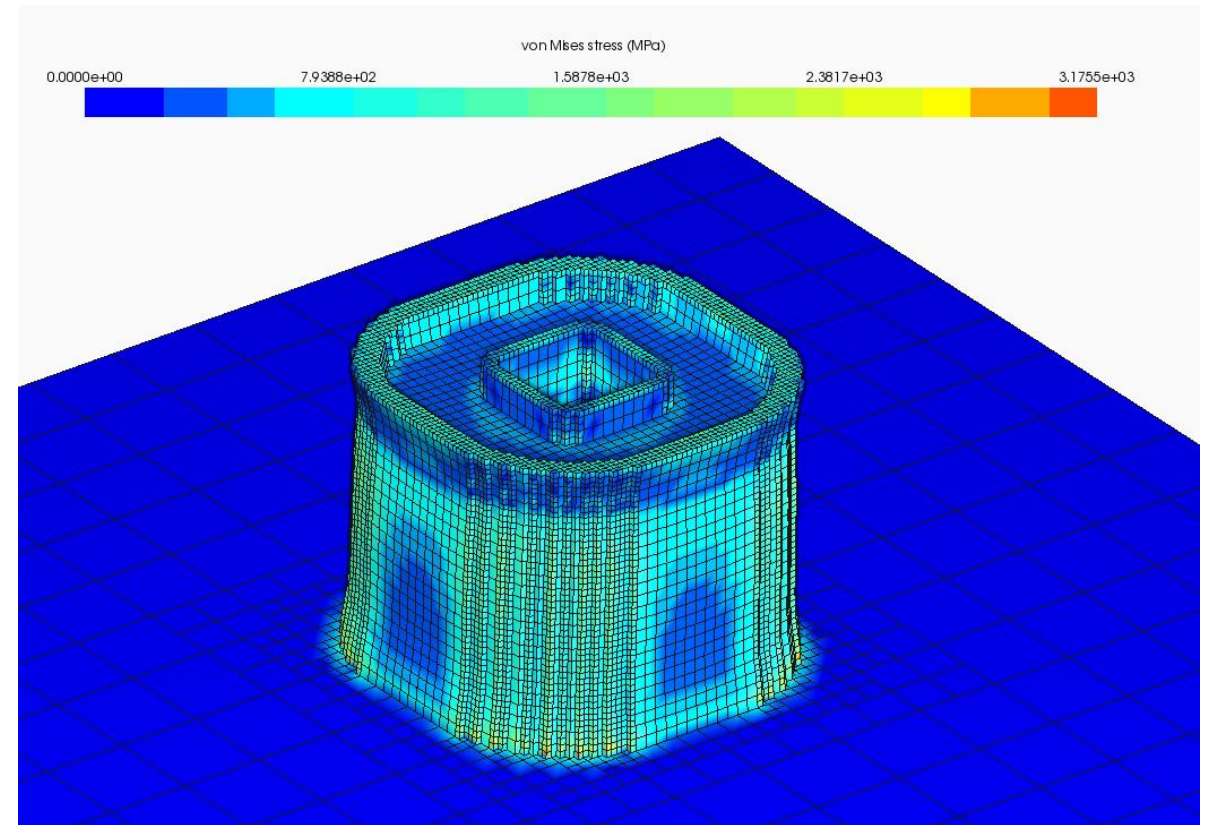
- ▶ Cauchy
- ▶ von Mises
- ▶ Principal stresses

Why use it?

View stresses to identify potential cracking issues or support structure failures.

How to use it?

View results from list in project tree.



Qualitative & quantitative stress results

Netfabb Premium + Netfabb Simulation Solver

What is it?

Choose between Quantitative or Qualitative stress calculations.

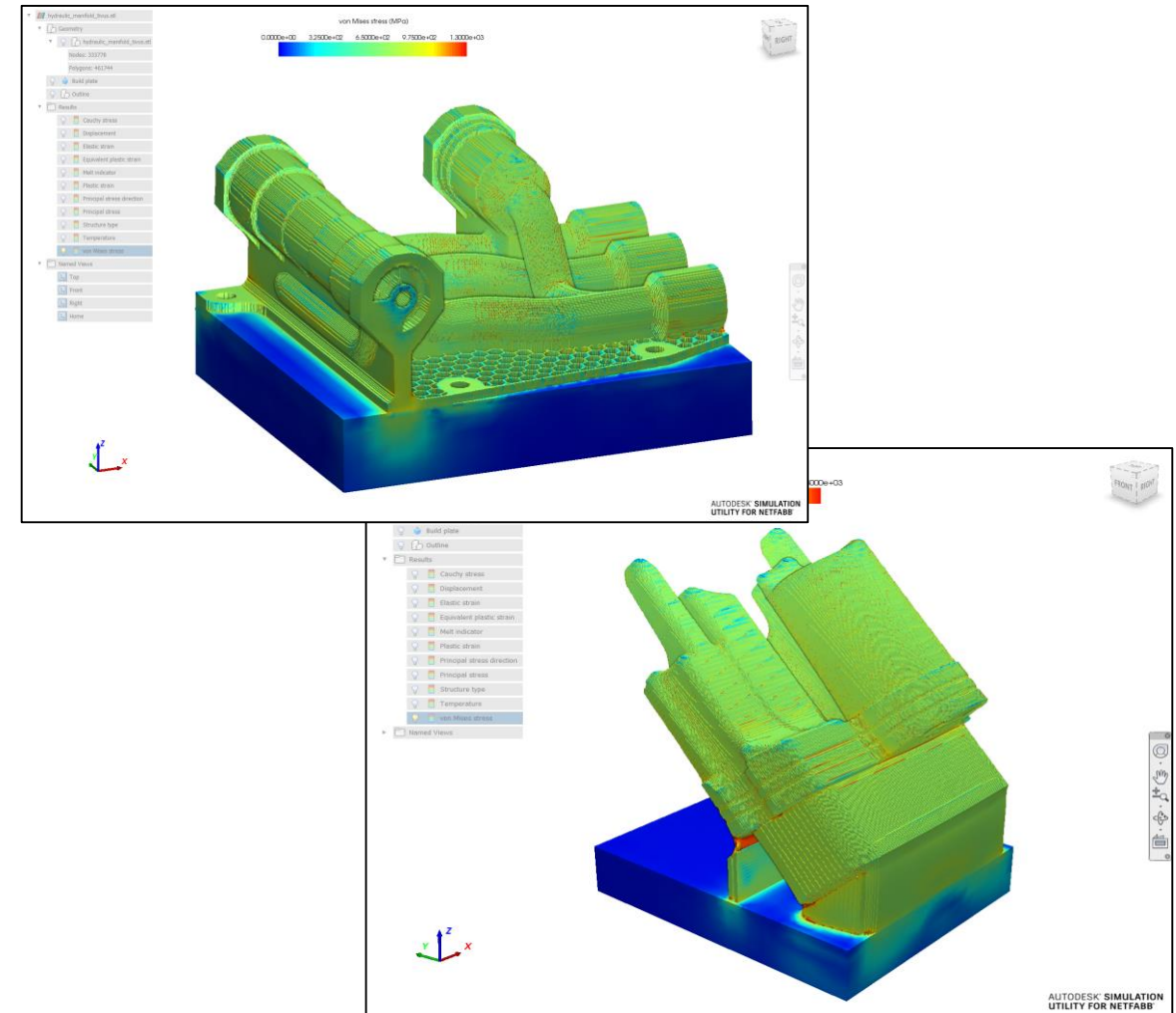
Why use it?

Qualitative results provide insight into part distortion or failure during the build process.

Quantitative results provide information regarding post-process stresses and possible distortion after build plate removal.

How to use it?

Choose the type of stress calculation from the Results tab in the Analysis settings dialog.



Multiple STL file import

Netfabb Premium + Netfabb Simulation Solver

What is it?

Import multiple parts and support structures into the simulation project.

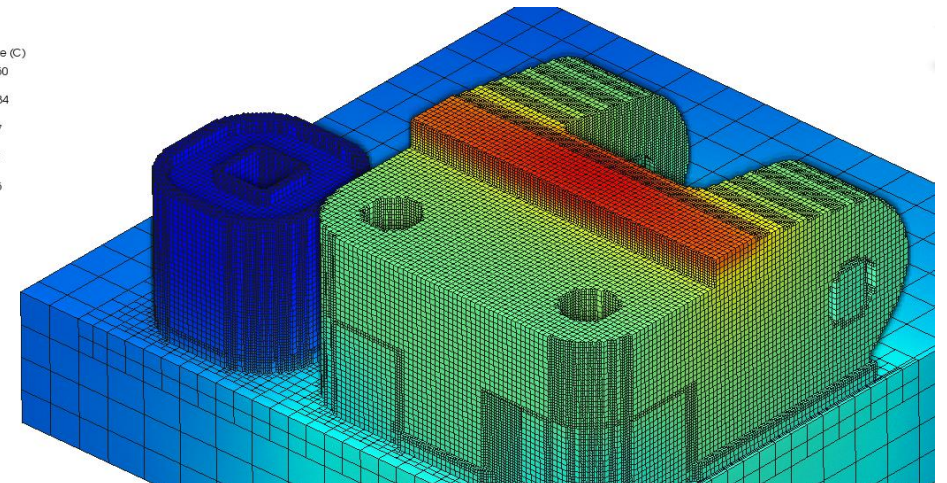
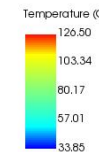
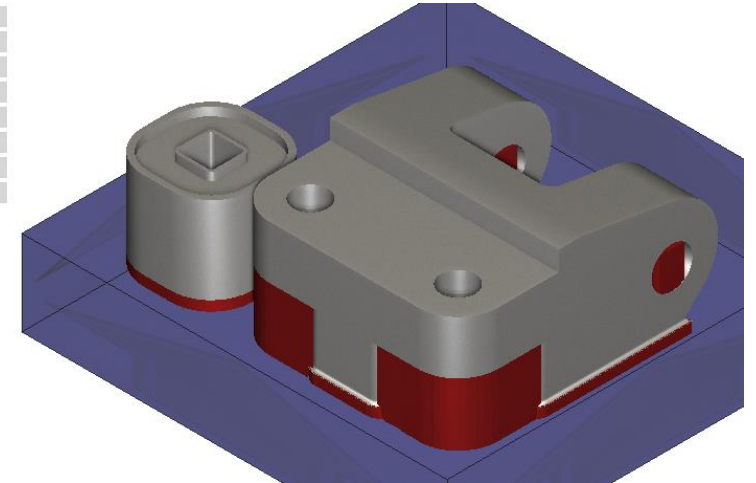
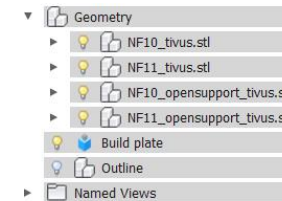
- ▶ Support volume fraction specified on import
- ▶ Use the move command to orient parts on platform

Why use it?

Simulate the entire build platform to get more accurate results of the real-world process.

How to use it?

Use the 'Import' command to bring in multiple STL files. Use the 'Move' command to orient objects on the platform.



Interoperability with Netfabb

Netfabb Premium + Netfabb Simulation Solver

What is it?

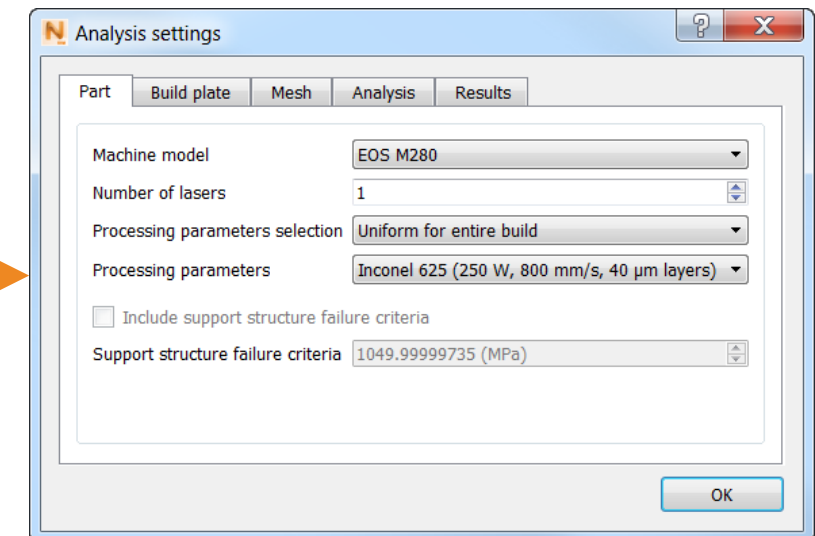
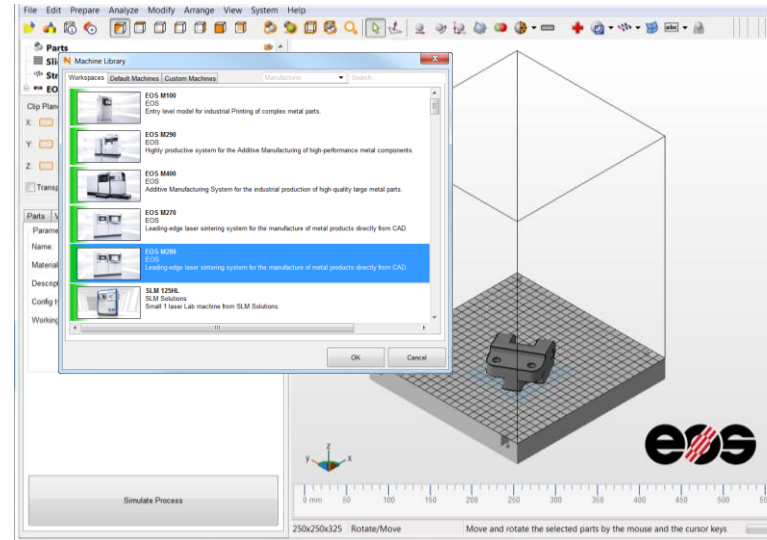
Import the machine manufacturer and model info, built plate size, and number of lasers from Netfabb into Simulation Utility.

Why use it?

Speed up analysis preparation time.

How to use it?

Select 'Simulate Build Process' in the Analyze menu.



Account for trapped powder

Netfabb Premium + Netfabb Simulation Solver

What is it?

Option to mesh and simulate loose powder between parts and/or support structures.

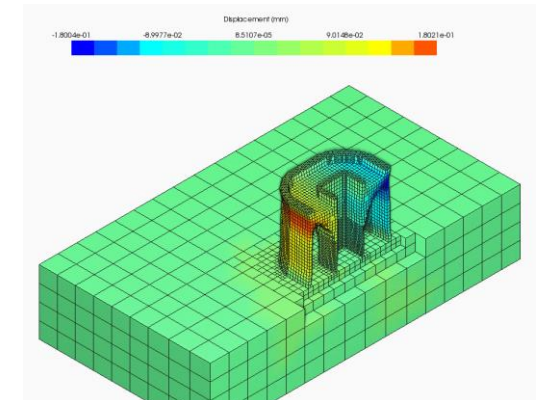
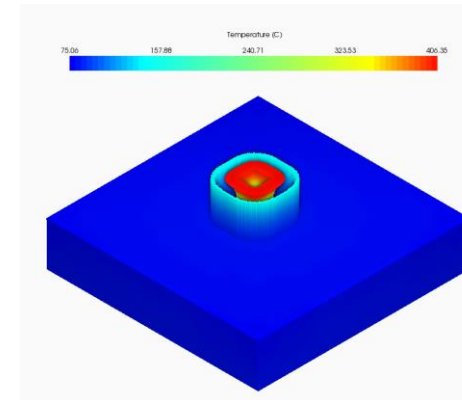
Why use it?

Increase thermal analysis accuracy to account for conduction to trapped powder when parts are closely nested on the build platform.

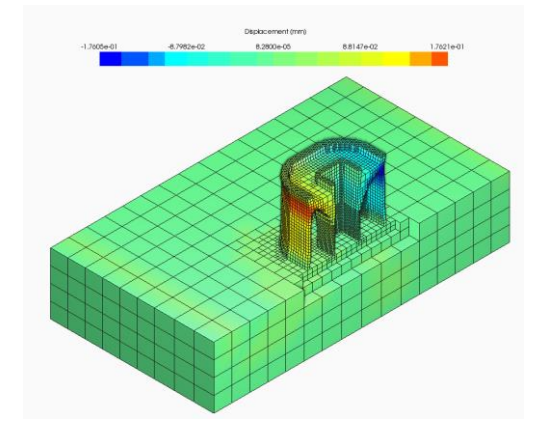
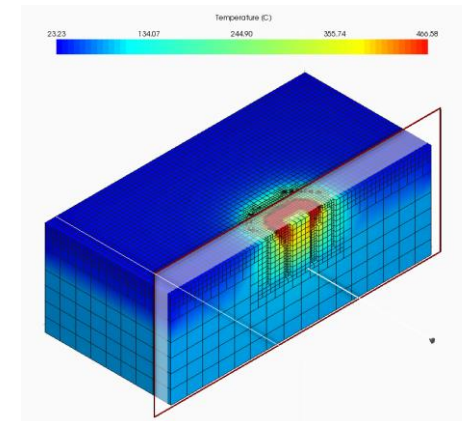
How to use it?

Select 'Trapped Powder' from Analysis Settings dialog.

Uniform heat flux



Conduction to loose powder



Improved part interaction

Netfabb Premium + Netfabb Simulation Solver

What is it?

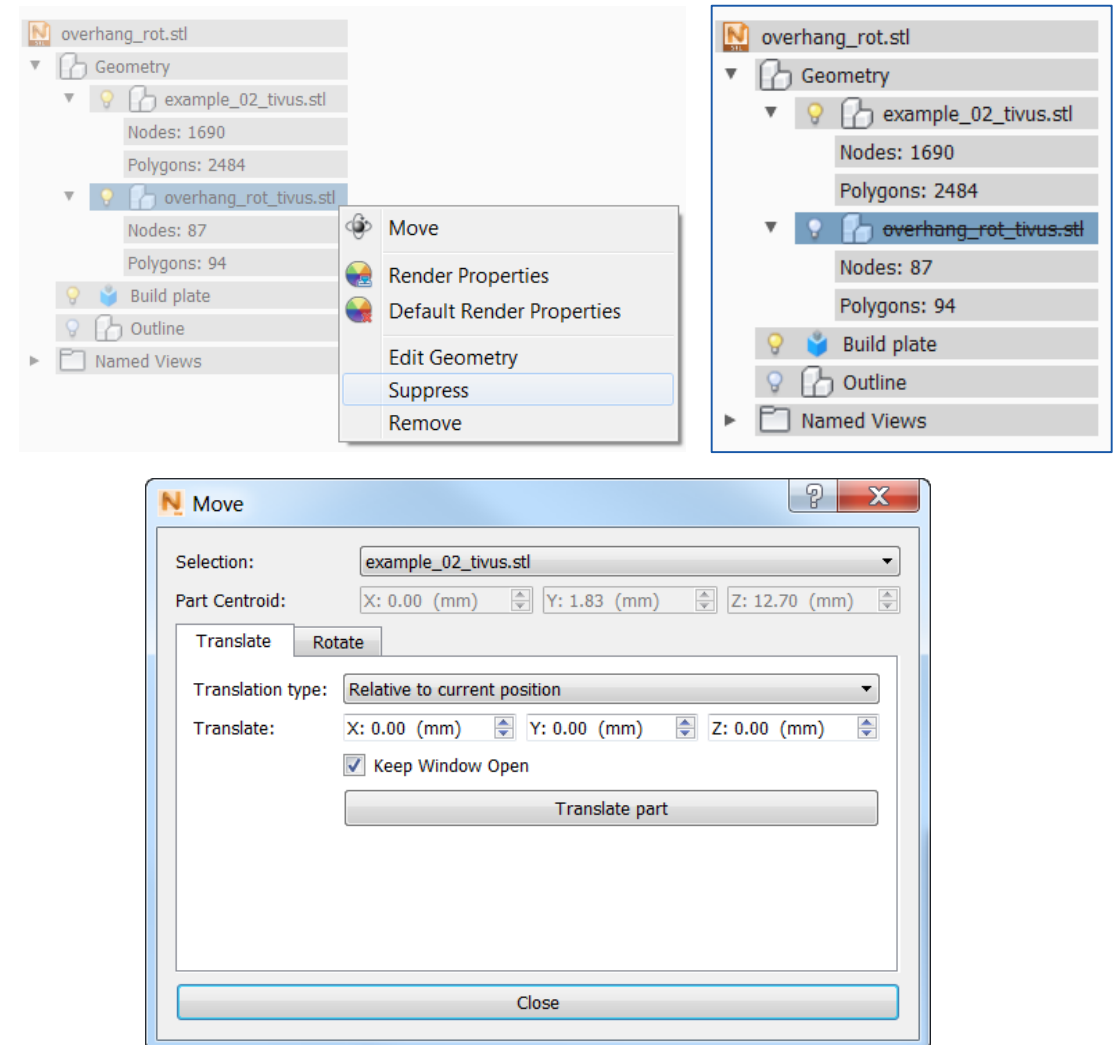
Suppress or remove unwanted geometry from the simulation and easier selection of geometry for move command upon placement.

Why use it?

More control over geometry availability and placement speeds up the preparation process.

How to use it?

Right click on parts in the model tree, select 'Suppress', 'Remove', or 'Move'.



Additional meshing controls

Netfabb Premium + Netfabb Simulation Solver

What is it?

Ability to choose between wall thickness or layer based meshing approaches and specify mesh sizing parameters.

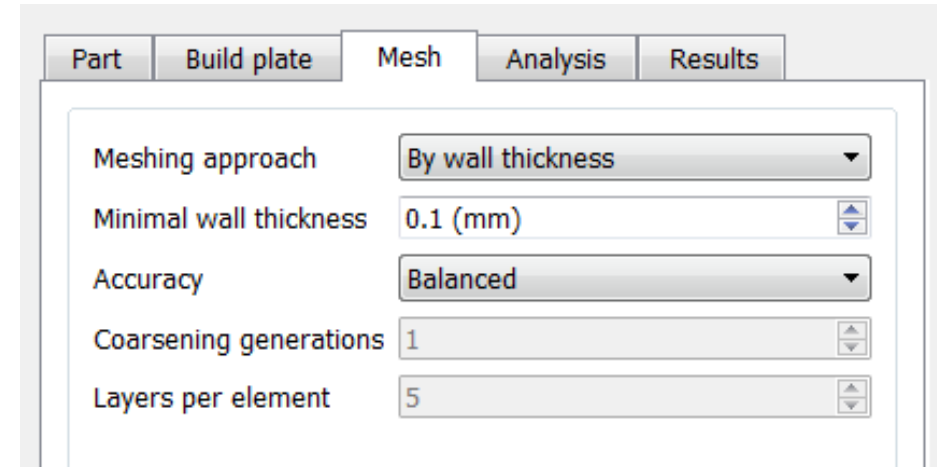
Why use it?

Improved control over meshing helps balance analysis time and accuracy.

How to use it?

In the Analysis Setup dialog, use the Mesh tab to specify meshing parameters.

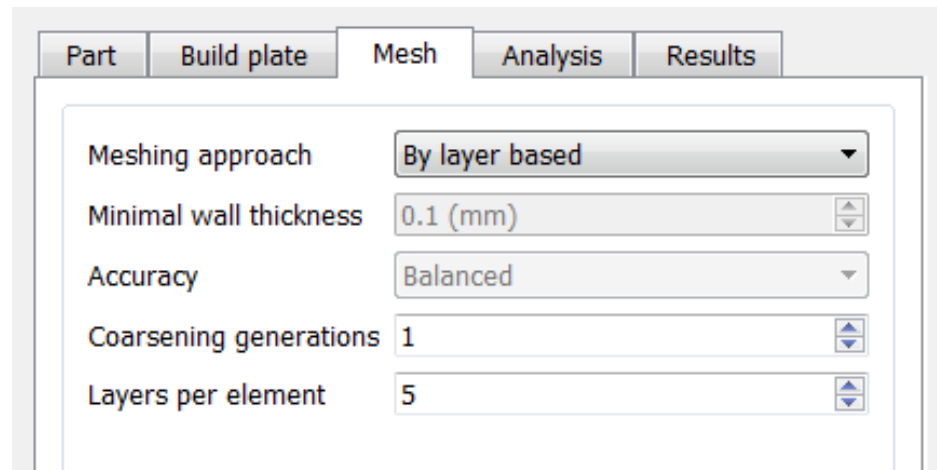
Wall thickness



The screenshot shows the 'Mesh' tab of the 'Analysis Setup' dialog. The 'Meshing approach' is set to 'By wall thickness'. Other parameters include 'Minimal wall thickness' at 0.1 (mm), 'Accuracy' at Balanced, 'Coarsening generations' at 1, and 'Layers per element' at 5.

Part	Build plate	Mesh	Analysis	Results
Meshing approach: By wall thickness				
Minimal wall thickness: 0.1 (mm)				
Accuracy: Balanced				
Coarsening generations: 1				
Layers per element: 5				

Layer based



The screenshot shows the 'Mesh' tab of the 'Analysis Setup' dialog. The 'Meshing approach' is set to 'By layer based'. Other parameters include 'Minimal wall thickness' at 0.1 (mm), 'Accuracy' at Balanced, 'Coarsening generations' at 1, and 'Layers per element' at 5.

Part	Build plate	Mesh	Analysis	Results
Meshing approach: By layer based				
Minimal wall thickness: 0.1 (mm)				
Accuracy: Balanced				
Coarsening generations: 1				
Layers per element: 5				

Assign unique PRM file for each geometry

Netfabb Premium + Netfabb Simulation Solver

What is it?

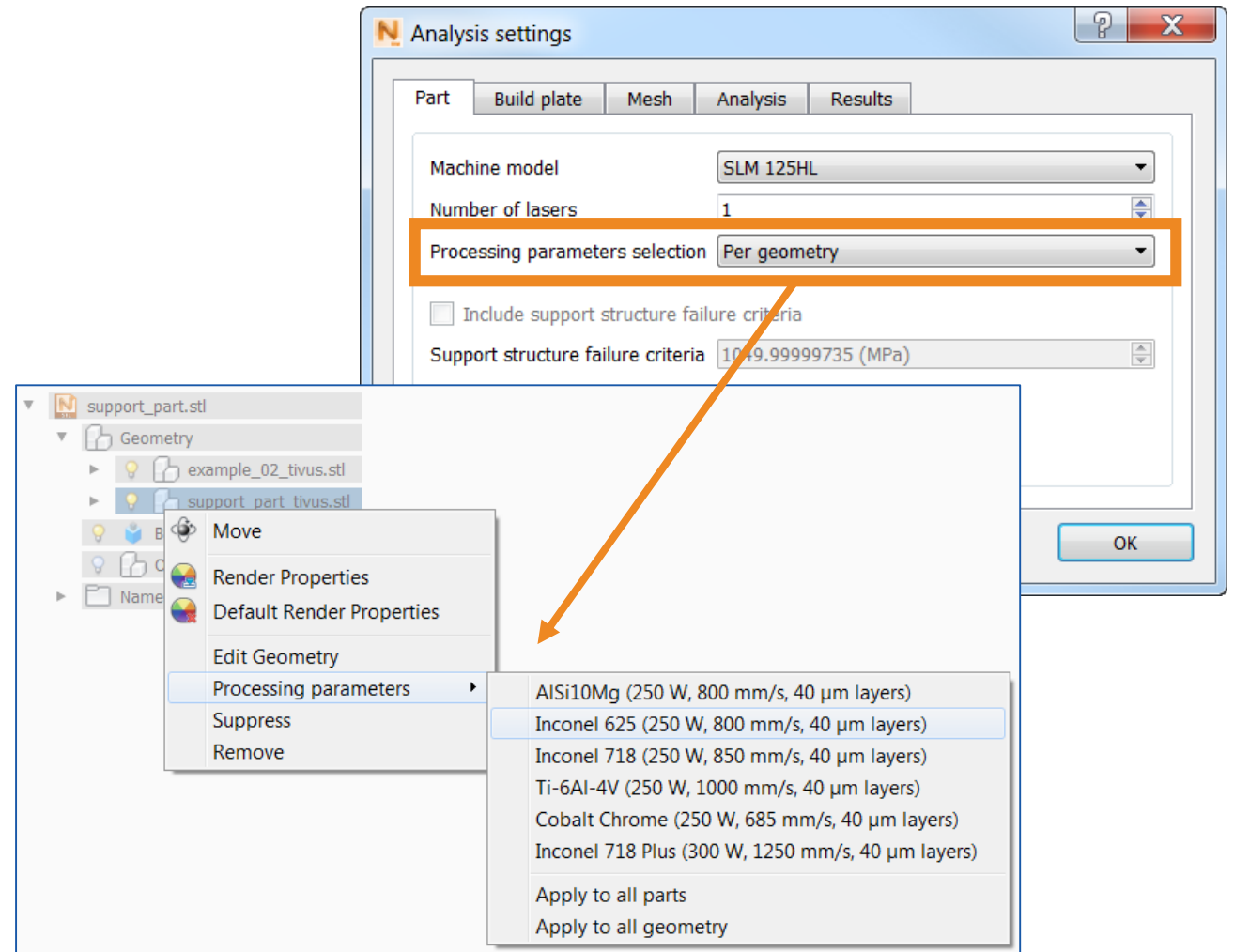
Apply unique processing parameters for each geometry in the analysis.

Why use it?

Accurately reflect differences in real-world processing parameters between support structures and parts.

How to use it?

Select 'Per geometry' within the Analysis settings dialog and specify the appropriate PRM file for each item from the model tree.



Stop analysis if recoater interference detected

Netfabb Premium + Netfabb Simulation Solver

What is it?

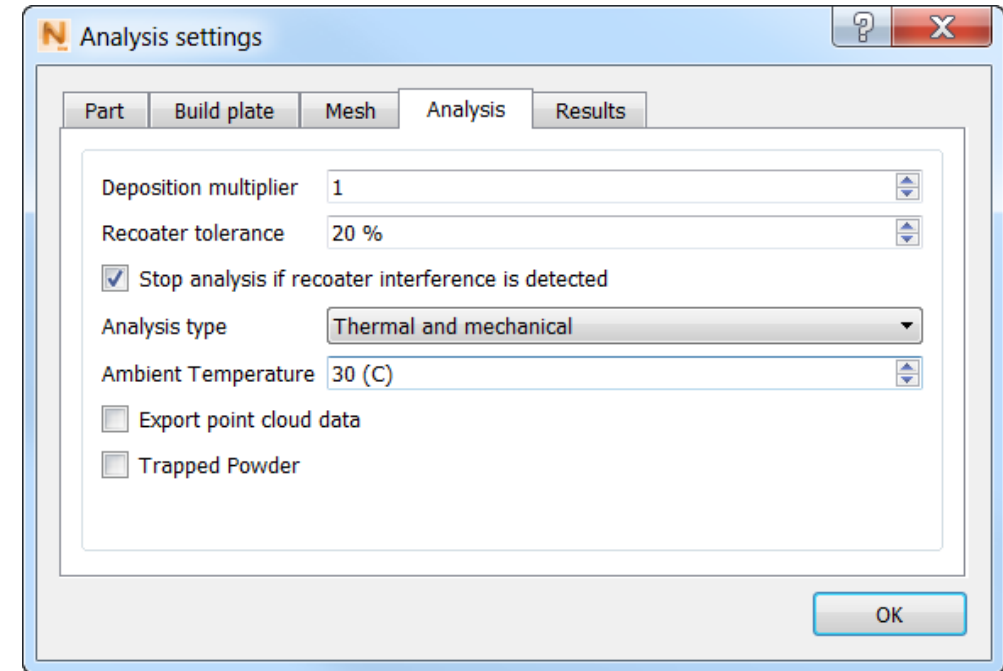
Option to stop the analysis if recoater interference is detected.

Why use it?

Eliminate wasted processing time calculating the build after a recoater interference is detected.

How to use it?

Check 'Stop analysis if recoater interference is detected' from the Analysis tab in the Analysis settings dialog.



Create custom materials

Netfabb Premium + Netfabb Simulation Solver

What is it?

New dialog to specify custom material properties & ability to monitor and cancel PRM generation via the job manager.

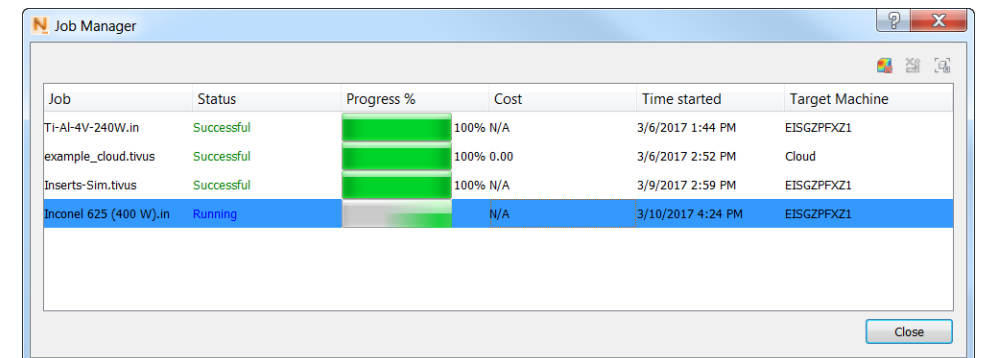
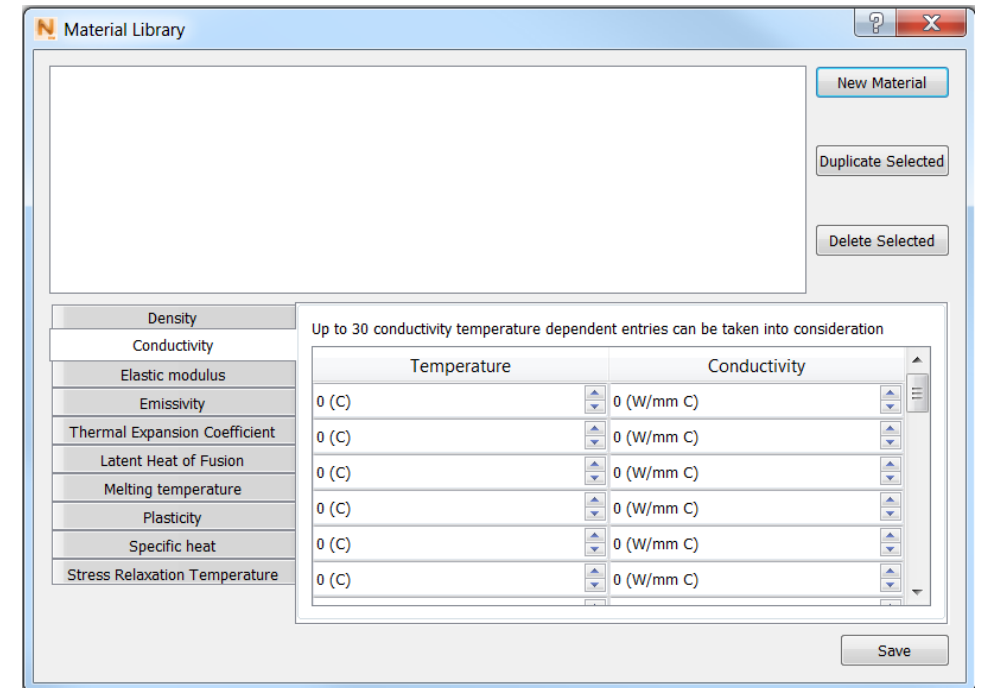
Why use it?

Simulate materials not currently available in library or use your own measured properties.

How to use it?

Open material library from the Home tab and enter in custom material data.

**Minimum requirements must be met for material to be applied to build plate or for PRM generation.*



UX refinements

Netfabb Premium + Netfabb Simulation Solver

What is it?

Pre-processor enhancements include:

- ▶ Define the background color
- ▶ Enhanced move command

Post-processor enhancements include:

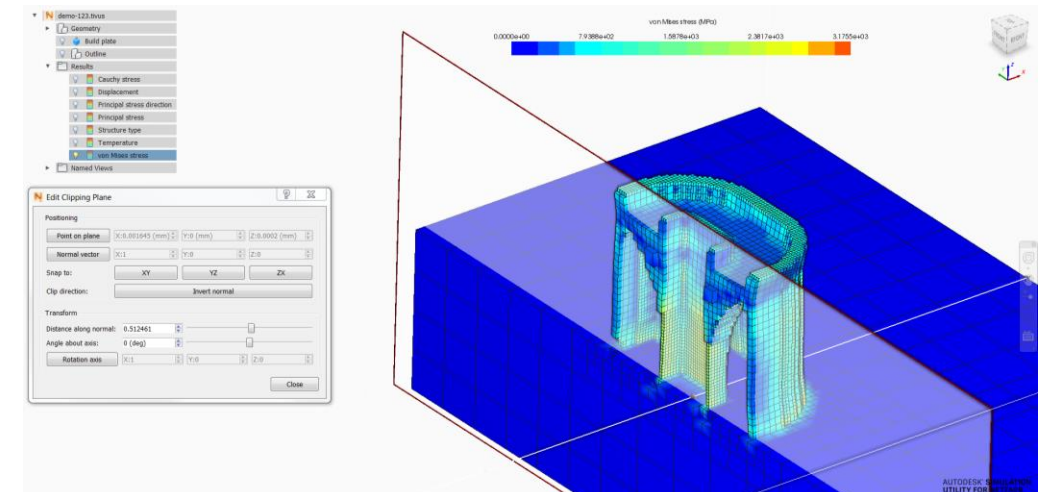
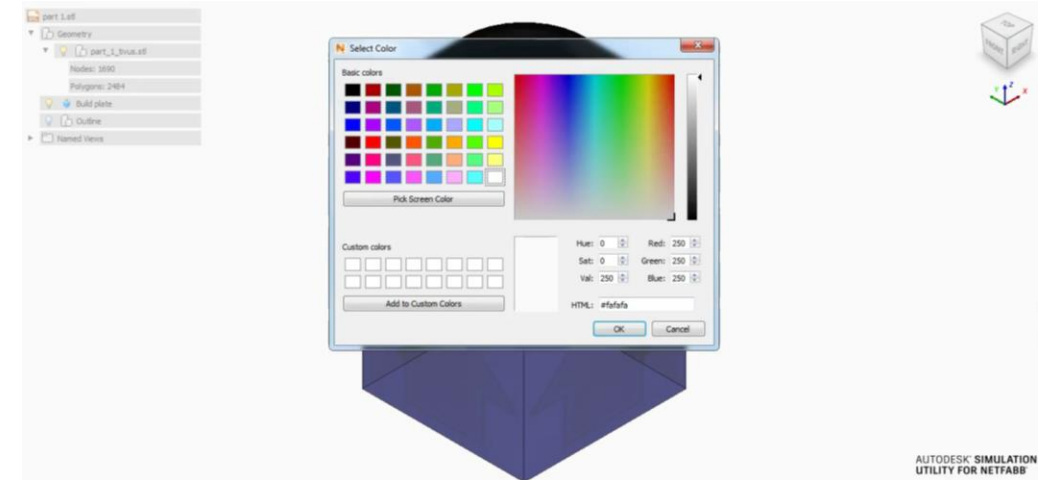
- ▶ New dialog for clipping plane

Why use it?

Easier to setup analyses and interrogate results.

How to use it?

Background color and clipping planes are available in the 'View' tab.



Material database updates

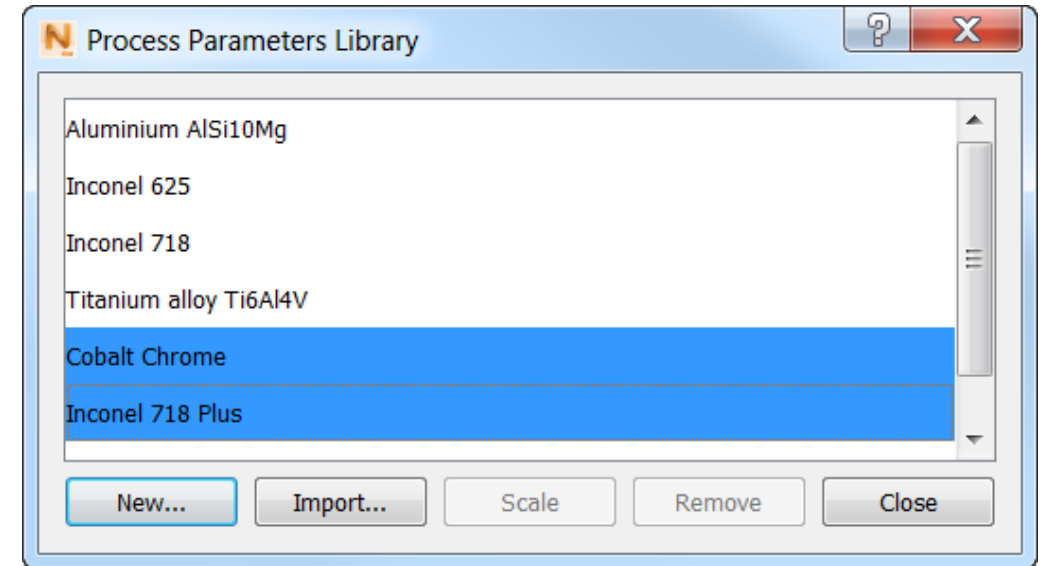
Netfabb Premium + Netfabb Simulation Solver

Material database additions:

- ▶ Cobalt Chrome
- ▶ Inconel 718 plus

Materials updated with as-deposited properties*:

- ▶ Inconel 625
- ▶ Inconel 718



**Simulations performed with Inconel 625 and Inconel 718 may produce different results than previous versions.*

Efficient Preparation for CNC Finishing

Powershape Utility for Netfabb

Dynamic editing for Flexistock and Superstructure

Netfabb Premium



What is it?

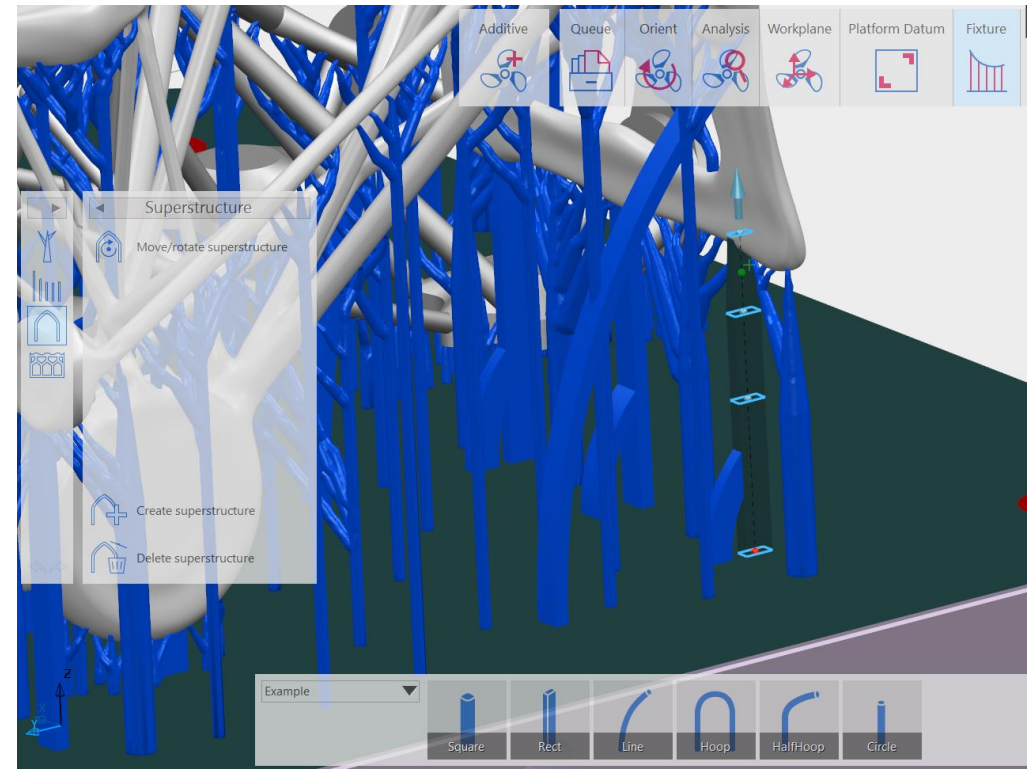
Dynamically change the size, orientation, and placement of Flexistock and Superstructures.

Why use it?

More precise control when adding stock to the part or placing support structures.

How to use it?

Upon placement of Flexistock or Superstructures, use your cursor to dynamically change the geometry.



Export for simulation

Netfabb Premium

What is it?

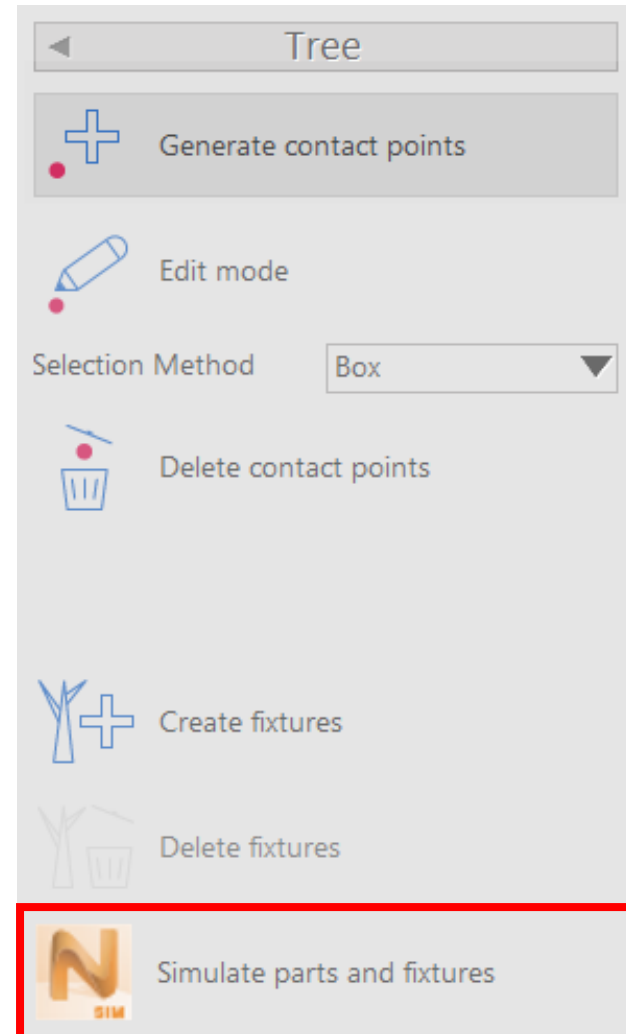
Automatically send parts and supports/fixtures to the Netfabb Simulation Utility.

Why use it?

Quickly export multiple geometries for analysis.

How to use it?

'Simulate parts and fixtures' command is available in the tree or column fixture menus.





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