BEST PRACTICE:

MODIFYING SURROUND SUPPORTS

Stratasys®
3D Printers and Production Systems

CAD ■ Insight □ Finishing □ Maintenance/System □ Skill Level ■■□

Optimized design allows for interior chambers without support structures.

Real Challenge

Recently, a Stratasys customer inquired about using Fortus 3D Production System to manufacture a medical device out of PPSF (polyphenysulfone) with a hollow interior chamber as one single part. The customer's existing profusion tray design was created for the injection molding process and included two separate sections that are molded and glued together. This is a time consuming and expensive process that the customer wanted to avoid due to low volume requirements and occasional design revisions.

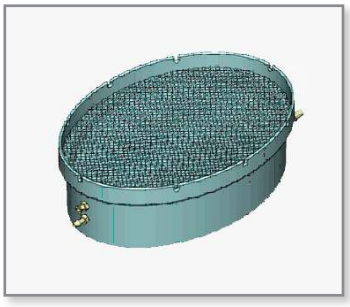

Figure 1: Profusion tray.

FDM technology offered the opportunity to manufacture the profusion tray in low volume at an acceptable cost with the flexibility to make design changes when needed. The current profusion tray design could not be built without supports generated inside the hollow coolant chamber.

Real Solution

The solution was to work with the original 3D CAD files and revise the geometry so that the part would build without interior support. The engineers shared files with the Applications Engineering team at Stratasys, creating a workable one-part design. This new optimized design utilized interior angles that would allow the coolant chambers of the part to be built using "self-supporting" angles (figure 2).

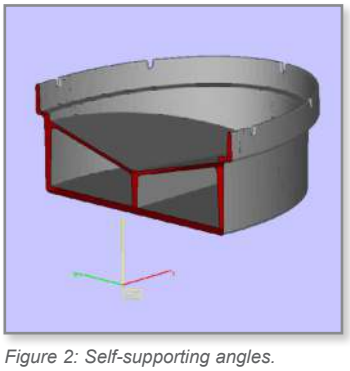

Figure 2: Self-supporting angles.

In order to build without support, these top surfaces had to be changed so that no interior angle in the chamber would be greater than 45 degrees from the vertical. The 3D CAD file was revised to include this new angled geometry and a STL file was generated.

Real Results

Through an optimized design, this medical device company was able to produce an FDM part without internal supports (figure 3).

Figure 3: The "optimized design" profusion tray

FDM technology provided the company the opportunity to manufacture the profusion tray in low volume quantities at an acceptable cost with the flexibility to make design changes when needed. The end result is a functional product manufactured in one piece on a Fortus system from PPSF material.

Fortus®
3D Production Systems

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