Sealing FDM Parts With Insight

SOFTWARE / PRODUCT / FINISHING

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Overview

Sealing parts to hold water or some other liquid can sometimes be accomplished using Insight to create water-tight surfaces on the part. This technique does not work on every part geometry or for applications requiring high pressures; but, if you have a relatively simple geometry, like a cup, and you would like it to hold a liquid at atmospheric pressure, this method can seal parts without requiring a secondary operation after the build.

Orientation

It is recommended to build the part in an orientation that provides mostly vertical walls (as opposed to horizontal surfaces and/or surfaces with a small angle of incidence relative to horizontal). This is especially critical with curved surfaces like those on a cylinder.

Z axis

Vertical surfaces are ideal. Orient the part so most of the surfaces are vertical or close to vertical.

Avoid orienting the part with horizontal surfaces. Whenever possible.

Procedure

Two steps are required to seal parts using Insight to eliminate and/or cover up porosity within FDM parts. The first step is to use multiple contours to seal vertical walls of the part, and the second step is to use a varied number of contours and parallel offset rasters on subsequent horizontal layers to seal any porosity in the part. These steps are explained in more detail in the following sections.

STEP 1: Use multiple contours to seal vertical walls in the part. (It is recommended to use all contours and eliminate the need for rasters wherever possible. Use the linked contours feature and a slight negative air gap whenever possible.)
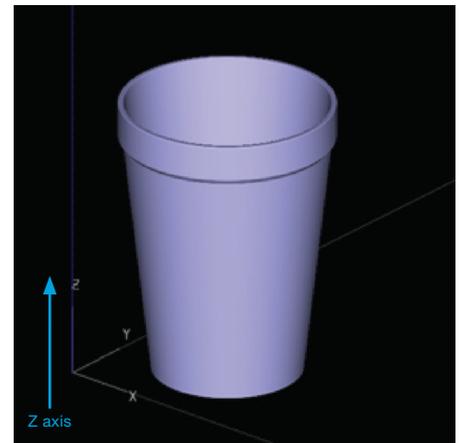
In these two examples, the cup and the blender container have mostly vertical surfaces.

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Here's how to apply multiple contours and turn on linked contours: There are two ways to apply these groups to your part. You can apply certain settings globally using the toolpath setup menu, or you can add custom groups to individual curves and change settings on a curve-by-curve basis. Both methods are illustrated below.

STEP 2: Use the parallel offset rasters feature, or custom groups, to create sequential layers with varied numbers of contours to cover up the raster turnaround areas on each layer, and parallel offset rasters to seal up any potential gaps between adjacent rasters. (See illustrations.)

Ceramic stars and plastic cones are two examples of finishing media.

CONTACT

For questions about the information contained in this document,
contact Stratasys at www.stratasys.com/contact-us/contact-stratasys.

stratasys®

E info@stratasys.com / STRATASYS.COM

HEADQUARTERS

7665 Commerce Way, Eden Prairie, MN 55344
+1 800 801 6491 (US Toll Free)
+1 952 937 3000 (Intl)
+1 952 937 0070 (Fax)

2 Holtzman St., Science Park, PO Box 2496
Rehovot 76124, Israel
+972 74 745 4000
+972 74 745 5000 (Fax)

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