

Design Guides - SLS 3D Printing

Build Volume: 350x350x420mm

Advantages

Self-supporting, no support required
 High strength parts
 Chemical resistance
 Biocompatible
 Accurate to CAD
 Fast build times - No tooling costs
 Complex geometries possible

Tips & Tricks - hollow parts out with escape holes for trapped materials.
 Anneal living hinges by dipping in boiling water and work back and forth.

Surface Finishes

Sand blasting
 Polishing
 Painting
 Dying

Materials

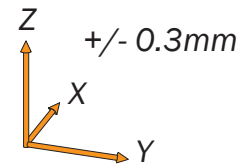
PA 12
 PA 12 + GF
 PA 11
 PA 6

Drawbacks

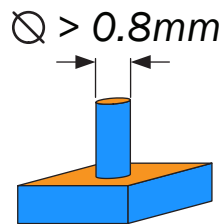
Rough surface finish
 Limited material choice
 Low resolution so loss of fine details
 Warping

Tolerances

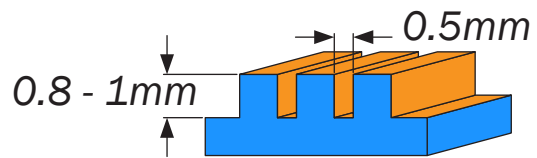
+/- 0.3mm
 is standard.



Pins - standard tolerance is +/- 0.3mm so any features with dimensions below this are unlikely to be printed without issue. So pins should be designed $\geq 0.8\text{mm}$.

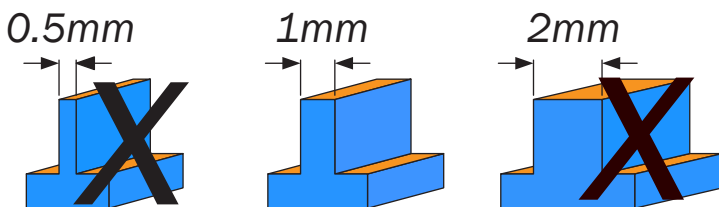
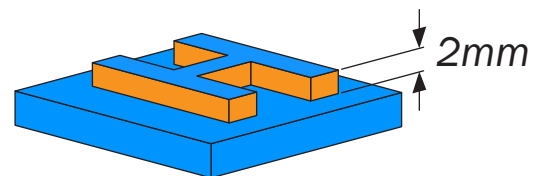


Slots - effected by depth or thickness of the wall, $\geq 0.5\text{mm}$ is minimum but will fail to print if the depth or wall thickness is over 2mm.



0.8mm - 1mm is preferred.

Walls - thicker walls are at risk of warpage. Thin walls can also be a problem area. 0.7mm minimum, but 1mm is preferred.



Text - sans serif such as Arial with a minimum font height of 2mm. Embossed text: $> 1\text{mm}$ high. Engraved features: $> 1\text{mm}$ deep.

Mating (axels, gears)

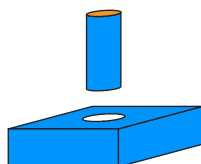
$> 0.5\text{mm}$ and $< 1\text{mm}$ gaps prevent fusion.

Min Clearance

$> 0.5\text{mm}$

Max Clearance

$< 1.0\text{mm}$



Holes - the deeper the hole the larger the diameter needed. All holes should be $\geq 1\text{mm}$. Blind holes should be designed with an escape hole to remove powder.

