

HLH Design Guide: SLS 3D Printing

Tips & Tricks

- Hollow parts out with escape holes for trapped materials.
 - Anneal living hinges by dipping in boiling water and work back and forth.
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Build Volume:

350 x 350 x 420mm

Materials

PA 12
PA 12 + GF
PA 11
PA 6

Surface Finishes

Polishing
Sand Blasting
Painting
Dying

Advantages

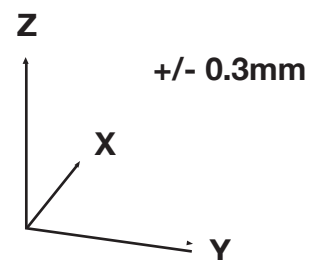
High strength parts
Chemical resistant
Biocompatible
Accurate to CAD
Fast build times - no tooling costs
Self-supporting (no support required)
Complex geometries possible

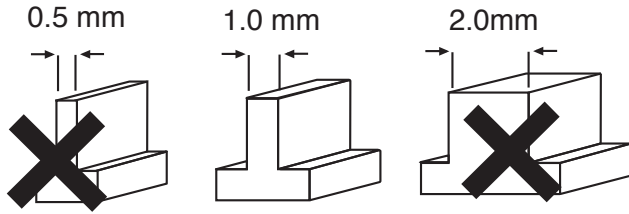
Drawbacks

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

Tolerances

+/- 0.3mm is standard



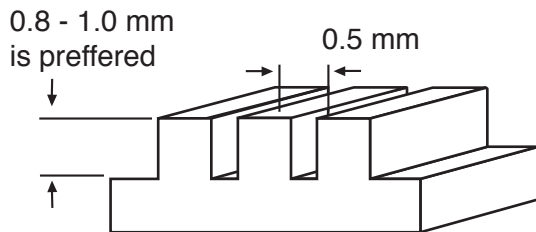
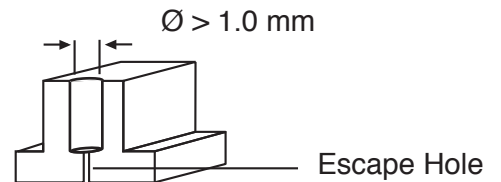


Walls

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

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.

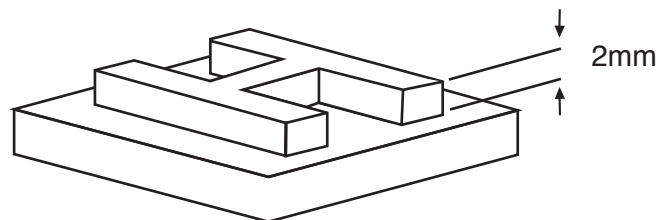


Slots

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.

Text & Engraved Details

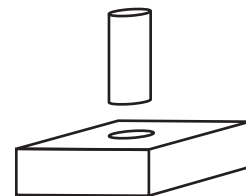
Sans serif such as Arial with a minimum font height of 2mm. Embossed text: $> 1\text{mm}$ high. Engraved features: $> 1\text{ mm}$ deep.



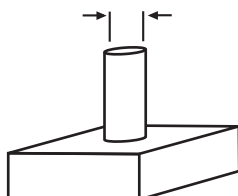
Mating (axels, gears) $> 0.5\text{mm}$ and $< 1\text{mm}$ gaps prevent fusions

Min. clearance $> 0.5\text{mm}$

Max. clearance $< 1.0\text{mm}$



$\text{Ø} > 0.8\text{mm}$



Pins

Standard tolerance is $\pm 0.3\text{mm}$, so any features with dimensions below this are unlikely to be printed without issue.

So, pins should be designed $\geq 0.8\text{mm}$.