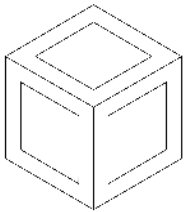


Design Guidelines For 3D Printing and Sintering Filamet™

When you are designing for parts to be printed with The Virtual Foundry's Filamet™, there are a few considerations to take into account. The way that you design parts determines the way that they come out.

When you are designing parts, think about the concept of generative design. Although parts don't have to be designed that way, or modified later to be generative, it is what works best with this process and it is the most cost effective way to make FFF metal parts.



Maximum Part Size

X: 60mm
Y: 60mm
Z: 60mm

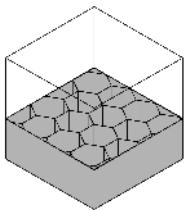
The maximum part size is unknown. The maximum that is recommended is the volume of 60mm³. What works best is thinner structures similar to the concept of generative design. The denser the part is, the more likely that it may not sinter fully.



Minimum Part Size

No minimum

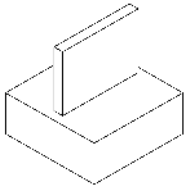
The smallest part you can sinter is the smallest part that you can print. The nozzle size that is recommended is 0.6mm. This means the smallest part that you can print would be around 0.6 x 1.2 x 0.4mm when printing with the recommended nozzle size.



Minimum Infill

30%

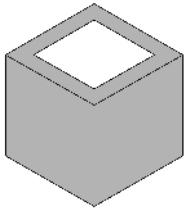
The minimum infill is the lowest amount of infill that you can have to successfully sinter a part. The internal structure is important to getting the part to sinter without caving in on itself but it does not need to be solid if your part does not require it.



Minimum Wall Thickness

0.6mm (one nozzle width)

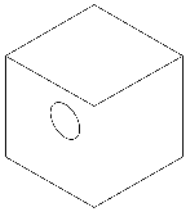
The minimum wall thickness is the thinnest the walls can be to be able to successfully sinter a part. This is important because if you go thinner than this, shrinkage could cause holes through your part.



Minimum Shell Thickness

1.8mm

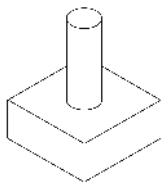
The minimum shell thickness is the thinnest the shells can be to be able to successfully sinter a part. This is important because if you go thinner than this, shrinkage could cause holes in your part.



Minimum Hole Size

1mm Diameter

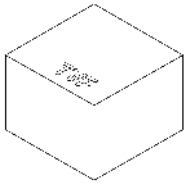
Holes hold their shape well in this process. The smallest hole that you can sinter is determined by shrinkage. A hole that is smaller than this could completely disappear when the part shrinks during sintering. Consider undersizing holes and drilling them out to tolerance during the finishing stage. Some holes that have specific placement should be added after sintering to ensure placement is accurate. It is recommended that you tap holes after sintering as thread features become less defined in the sintering process.



Minimum Pin Diameter

1.8mm

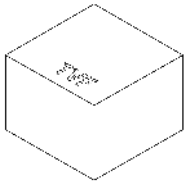
This is the smallest that a feature sticking out from a larger part can be to successfully sinter and have the pin attached after the cycle is complete.



Minimum Embossed Feature

0.25mm

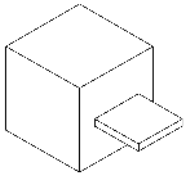
Embossed features can be quite shallow as they keep their shape well. Layer lines and print imperfections can make it through a sintering cycle onto the final part.



Minimum Debossed Feature

0.25mm

Debossed features can be quite shallow as they keep their shape well. Layer lines and print imperfections can make it through a sintering cycle onto the final part.



Minimum Unsupported Overhang Angle

55°

This angle is larger than most other filaments because Filamet™ is more viscous, causing it to hold its shape better over larger angles.