

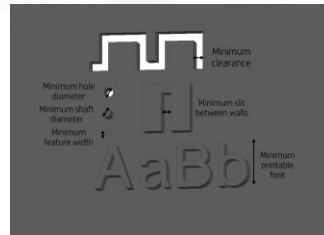
Dimensional accuracy

- The dimensional accuracy that can be achieved by HP Multi Jet Fusion 3D is +/- 0.2 mm up to 100 mm and 0.2% above that value, measured after sand blasting



Minimum printable features

Minimum values	mm
Hole diameter at 1mm thickness	0.5 mm
Shaft diameter at 10mm height	0.5 mm
Printable font	6 pt
Printable feature or detail	0.1 mm width
Clearance at 1mm thickness	0.5 mm
Slit between walls	0.5 mm

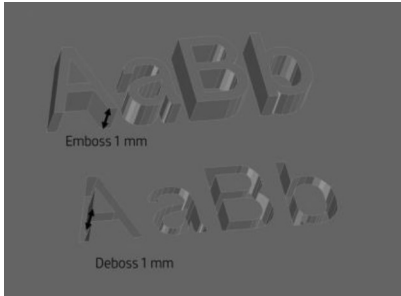


Engraving


- Multi Jet Fusion technology allows for printing letters, and a number of drawings with a very high resolution and definition

ⓘ Any text, number or drawing included in a part is recommended to have at least 1 mm of depth and to be oriented in the XY plane

- For parts with high thickness, the depth or protrusion should be higher than 1 mm
- Embossings → better oriented face up
- Debossings → better oriented face up



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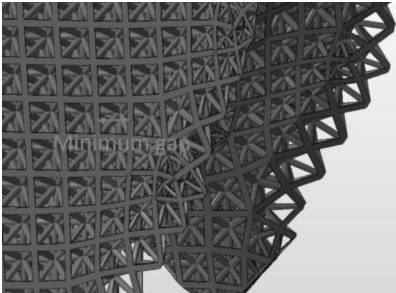
Multi Jet Fusion technology allows for printing letters, and a number of drawings with a very high resolution and definition.

In order to get the best possible output, any text, number or drawing included on a part should have at least 1 mm of depth or protrusion.


For parts with high thickness, depth or protrusion should be higher than 1 mm.

Solid part or structural fill

- Multi Jet Fusion allows you to print:
 - topology-optimized, generative designs, or
 - even small lattice structures
- This kind of designs helps **to reduce**:
 - the **weight** of the part and the quantity of material used
 - the **operating cost** in applications which are very weight sensitive
- The minimum gap recommended in a lattice structure to ensure all the material inside the part can be removed is **1 mm**



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Multi Jet Fusion allows to print topology-optimized, generative designs or even small lattice structures. This kind of designs helps to reduce the weight of the part and the quantity of material used, which causes not only the drop of the part cost, but also helps to reduce the operating cost in applications which are very weight sensitive.

The minimum gap recommended in a lattice structure to assure all the powder inside the part can be removed is 0.5 mm.

At this moment we consider it same as clearance

Wall thickness

FOR CANTILEVERS

- The minimum wall thickness for a cantilever to be printed on a part depends on the aspect ratio:

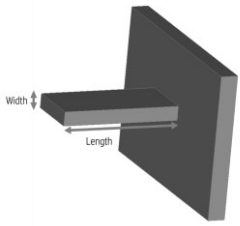
$$\text{Aspect ratio} = \frac{\text{length}}{\text{width}}$$

For a cantilever with a width smaller than 1 mm, the AR should be lower than 1. No specific recommendations for widths bigger than 1 mm

GENERAL WALL THICKNESS:


Minimum wall thickness	mm
Short walls orientated in the XY plane	0.3 mm
Short walls orientated in the Z plane	0.5 mm

However, it is recommended to **increase thickness** so that it is higher than this value or add ribs or fillets in order to reinforce the parts.



Tip: Make your part as hollow as possible. It saves agent and powder. Also, sink marks are reduced.

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The minimum wall thickness that can be printed in a part depends on the aspect ratio:

$$\text{Aspect ratio} = \frac{\text{length}}{\text{width}}$$

The minimum wall thickness is 0.3 mm for short walls orientated in the XY plane, and 0.5 mm for short walls orientated in the Z plane, for an aspect ratio of 1.

However, it is recommended to increase thickness from this value or add ribs or fillets in order to reinforce the parts.

Very thick walls (XXmm) can accumulate heat and cause spot shrinkage in dense areas with accumulation of material. Check with latest heat map.

Minimum spacing

Between parts printed as assemblies

- Sometimes a pair of printed parts need to fit together due to their final application
- In these cases, it is recommended to have **gaps of at least 0.4 mm** (+/-0.2 mm of tolerance of each part) in the interface areas that should fit together, in order to ensure correct assembly

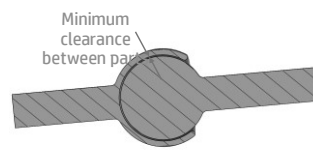


Between parts placed in the print chamber

- For optimal stability, it is recommended to use a distance of **2 mm between parts**
- In some cases this can be reduced to 1mm if the parts have a low volume (~1 cm³)

Between parts to be assembled after printing


- Parts to be assembled that are printed together should have a minimum clearance between them of 0.5 mm
- Parts with very thick walls above 50 mm should have a **higher gap** in order to ensure proper performance



Pre-processing


Tessellation

- Before sending a job to a 3D printer, the model to be printed needs to be **tessellated**. That means that its geometry needs to be translated into **triangles**
- These triangles are the geometry that the printer uses to create the **layers** later on

 It is very important to pay attention at this step, because it may create plot quality associated issues, such as lack of accuracy, or high processing times if it is not done correctly.

- Some of the **standard formats** in the Additive Manufacturing industry are **3MF and STL**
- A normal file size for a model is around **1-30 Mb**. But it depends on a host of factors such as:
 - the type of software it comes from
 - the number of triangles
 - the number of details and the level of detail
 - etc.

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Before sending a job to a 3D printer, the model to be printed needs to be tessellated. That means that its geometry needs to be translated into triangles.

These triangles are the geometry that later on the printer uses to create the layers. It is very important to pay attention at this step, because it may create plot quality issues associated, such as lack of accuracy, or high processing times if it is not done correctly.

Some of the standard formats in the Additive Manufacturing industry are 3MF (with more information about the model) and STL.

A normal file size for a model is around 1-30 Mb. But it depends on a host of factors such as type of software it comes from, number of triangles, number and level of details, etc.