DESIGN GUIDELINES FOR PRINTING WITH 3D MULTI JET FUSION TECHNOLOGY

DIMENSIONAL PRECISION AND TOLERANCES

For Nylon PA12 classic and PA12S, the dimensional accuracy guaranteed by HP Multi Jet Fusion 3D technology is +/- 0.3 mm for objects up to 100 mm, and 0.3% above this value. These values are measured after sandblasting.
For PA12GB (glass-reinforced), the tolerances are +/- 0.4 mm for objects up to 100 mm, and 0.4% for longer lengths.
For PA12 white and multicolor, and PA11, the tolerances are +/- 0.5 mm for objects up to 100 mm, and 0.5% for longer lengths.
For TPU, the tolerances are +/- 1 mm for objects up to 100 mm, and 1% for longer lengths. Due to the elastic nature of the material, these values are indicative and not guaranteed.

MAXIMUM PRINT SIZE

380x284x380mm

OPERATING TEMPERATURE

PA12 working temperature: MAX. 140 degrees Celsius

MINIMUM FEATURES OF PRINTED PARTS

- 1mm hole diameter
- Tree diameter (10 mm high) 1 mm
- Printable font 12 pt
- Detail/detail printable Width 8mm
- 1 mm thick blank space
- Minimum space between two walls 1 mm

LETTER AND NUMBERS INCISION

THE HP Multi Jet Fusion 3D technology allows you to print letters and numbers with a very high resolution and Definition

- It is recommended that any text or drawing included in a component has at least 1mm of depth and that is oriented to the XY plane
- For high-thickness parts, the depth or overhang must be > 1mm

It is possible that particularly fine embossing and engravings may not be visible, they may be filled with excess dust that should be difficult to be cleaned later. If an embossing or engraving is an essential part of your design, we recommend to make them as deep as possible. For optimal dust removal (so better details visibility), the width of the details must be at least equal to the depth.

FULL OBJECTS AND STRUCTURAL FILL

HP Multi Jet Fusion 3D technology allows you to print optimized structures both hollow and full.
It is advisable, if possible, to empty the interior of full objects so that you can also save significant cost and weight.
The dust that may have been left inside the hollowed structure must be removed after printing, the minimum diameter of the holes to allow this operation is 5 mm
FAMA3D do not grants the cleaning of holes if depth is higher than 3 times the diameter

WALL THICKNESS

The minimum thickness of the wall that can be printed depends on the shape ratio (width/height). As a rule, any
part that has an aspect ratio higher than 10:1 Is susceptible to showing warpage.
The minimum printable thickness of a wall is of 0.3mm for the short wall oriented on the XY axis, and of 0.5mm for walls oriented on Z axis. Increasing these values or adding borders or reinforcement structures could make the part stronger.
We recommend a minimum wall thickness of 1 mm in consideration of the post processing operations,

sandblast cleaning and surface smoothing process (on request). Below this value we cannot grant the correct execution of the finished part.
For parts to be treated with the "Vapour smoothing process" the minimum recommended wall thickness is 1,5 mm.
Very thick walls an accumulate heat and cause shrinkage in denser areas with an accumulation of material.

MINIMUM SPACING OF PRINTED PARTS AS A SET

Sometimes two printed parts must fit to each other depending on the final application. In these cases, it is recommended to keep a space of at least 0.4mm in the areas intended to fit each other.

PARTS TO ASSEMBLE AFTER PRINTING

• The part to be assembled must have a minimum blank space of 0.5mm between them
• The part with high thicknesses, greater than 50mm must have a larger space to ensure proper operation

SPACING IN THE DISPOSAL OF PARTS IN THE PRESS CHAMBERS

• For optimal stability, it is recommended to use a distance of at least 2 mm between the parts in the control room print
• In some cases the space can be reduced to 1mm if the part is less than 1 cm3

UPSKIN AND DOWNSKIN

Because of the 3D printing process, your objects will have different finishes depending on the orientation of your particular. The Upskin is the top part that remains slightly concave. The downskin instead is the part which stays at the bottom and is smoother and smoother to the touch. This is an important factor to consider when you set the orientation of the 3D model when printing. If the upskin and downskin can affect the desired result, you can set the orientation of the file and we will check it so, in case of need, our technicians will choose the best orientation in order to give you the best quality.

BENDING EFFECT

Large and flat, very dense planar parts or particularly thin parts are naturally exposed to the phenomenon of deformation, implicit in MJF technology, more or less evident, for which we cannot grant the flatness.
High thickness parts are also subject to this phenomenon if they are particularly large.
It's suggested to reduce the density the part adding reinforcements or internal honeycomb structures to limit this phenomenon.

MULTI PART FILE

Files containing multiple separate objects will not be accepted. Each object must be loaded individually in our online price calculator in order to ensure adequate quality control management.
For PA12 prints any groups of objects within a single file must reach us already designed inside a suitable containment cage (with a thickness of at least 1 mm and suitable meshes to contain the objects). Inside the cage, remember to space the objects at least 3 mm.
The cage will be treated as a single object from cleaning to eventual matte black colouring. It will not be possible for us to guarantee the finish and quality control of the objects contained in the cage.
Anthracite finish and paint options are not available.
Any multi-part files that have only thins connections between objects will no longer be accepted in order to avoid break of connections and loss of parts in the printing nest.

VAPOUR SMOOTHING (IF REQUIRED)

The vapour smoothing option requires thickness of parts of 1,5 mm or higher.
Parts shall have a "hanging point" to place the part into the machine (we recommend to add a small hook or ring – diam.1.5mm-) to be removed after printing).
Letter and numbers will also be "smoothed" in the process, we recommend a minimum width and thickness of 1 mm to keep them readable after treatment.

COMPLEX GEOMETRIES

FAMA3D reserves the right to verify and confirm the feasibility of particularly complex geometries. While these geometries are within the technical capabilities of the machine, they may require special attention or specific treatments to ensure their integrity (which may require an additional cost). Examples include long structures or very thin lattices, which, despite having minimum thicknesses greater than 1 mm, are extremely fragile to work with after printing.

In these cases, we recommend selecting the "Manual Sandblasting" option to ensure the integrity of the finished component.

For any additional support, please email supporto@fama3d.com or call +39 0331 642232