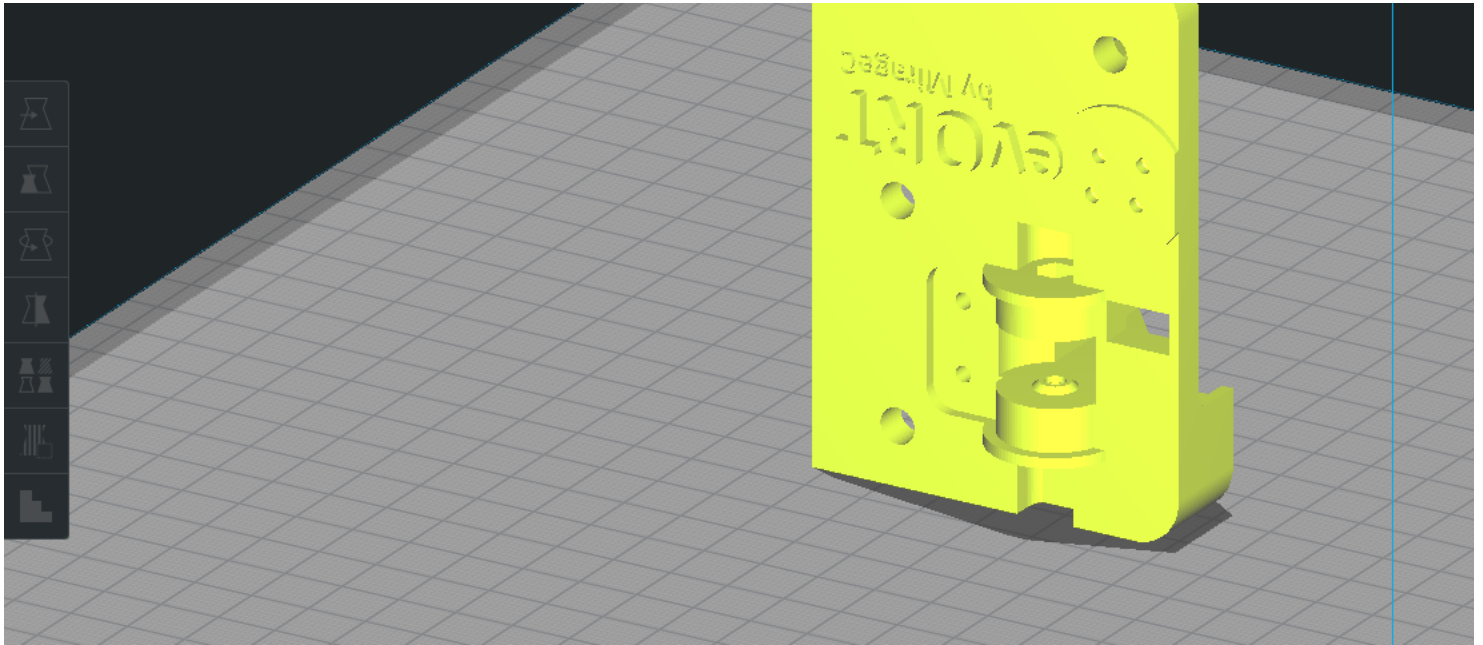


HevORT

Advanced DIY 3D Printer



How to print the HevORT STLs?

1. Which material?

Pretty much any common 3D printing material can be used to print the HevORT parts.
After trying a few materials over the years, here is how I would categorise them in a very non-scientific way:

Price: Price in USD per kilogram

Rigidity: Force required to induce deflection.

Crack Resistant: Amount of deflection before rupture. (Non-Brittleness)

Layer Adhesion: Difference between forces required to break perpendicular to layers VS parallel to layers.

Heat Resistance: Temperature value from which material loses its rigidity in Celsius degrees.

Easy to print: Level of technical knowledge or special equipment required in order to achieve good prints.

Material	Brand	Price	Rigidity	Crack Resistant	Layer Adhesion	Heat Resist	Easy to Print	Special Print Condition
ASA	FormFutura ApolloX	45	++++	+++	+++	98	++++	Enclosure
ABS	Filaments.ca	23	++++	+++	++++	105	+++	Enclosure
Nylon PA12	Filaments.ca	45	+++++	++++	+++++	110	+	SuperDry + Enclosure + Bed Adhesion compound
Nylon HD CF	Filaments.ca	98	++++	+++++	+++++	167	++	Dry + Enclosure + Bed Adhesion compound
Nylon Alloy910	Taulman3D	60	++	+++++	+++++	82	++++	Dry
PETG	Filaments.ca	30	+++	+++	++++	85	+++	Dry
PETG CF	Filaments.ca	38	++++	+++	+++	90	+++	Dry
PLA EcoTough	Filaments.ca	27	++++	+++	++++	70	+++++	NA
PLA	Generic	20	+++++	++	++++	65	+++++	NA
PC Polycarbonate	Never tried yet...							

I am currently running ABS on the big parts and HD CF Nylon for the more technical parts such as the Y and X carriages.

2. Placing your parts in the slicer.

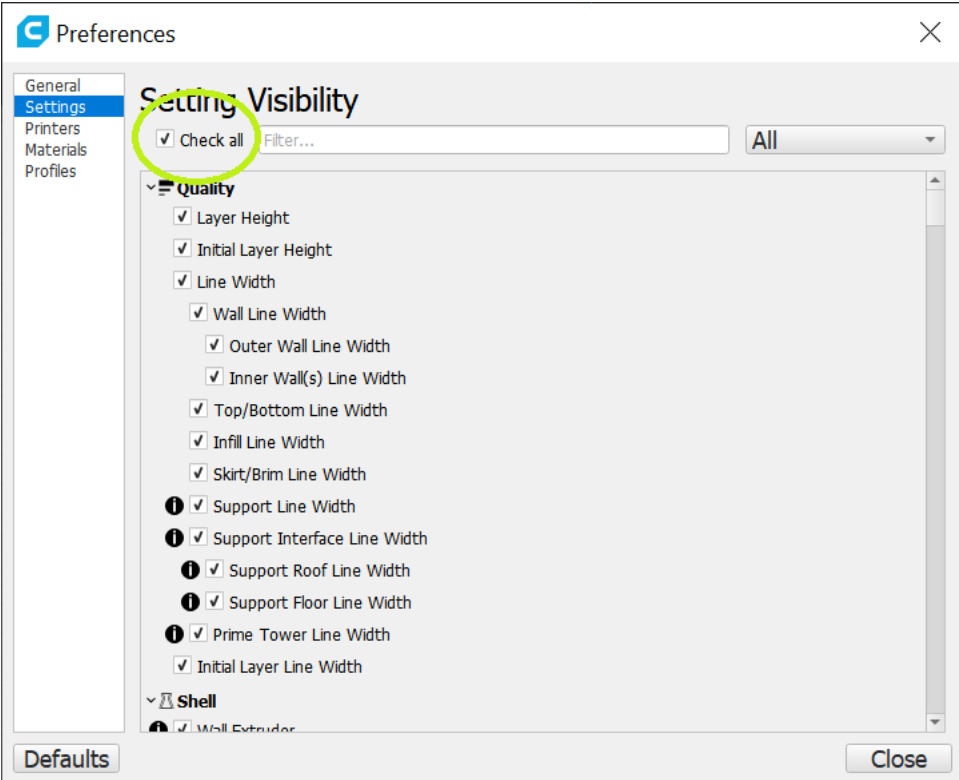
All STL files are already properly oriented for optimal print results and optimal layer orientation.

3. Slicer Settings

In this section I will assume that you have some experience with 3D printing and that your printer is calibrated. If you are not too sure about what I mean by calibrated, have a look at [my personal recipe for printer calibration](#)

The following printer settings are based on [Ultimaker Cura](#) setting nomenclature which may vary if you are using a different slicer.

Before we start, ensure to make all settings visible by going into:
Preferences/Configure Cura.../Settings
Select Check All then Close



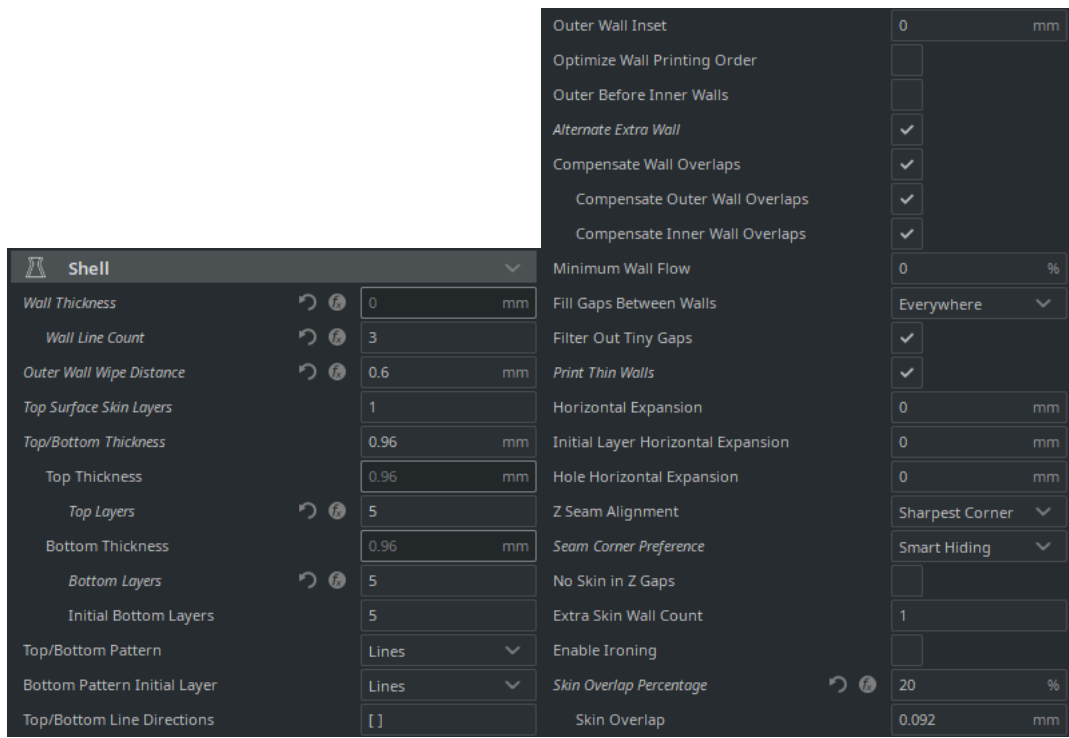
Note that not all settings will be detailed and explained.

QUALITY

Quality				
Layer Height			0.24	mm
Initial Layer Height			0.3	mm
Line Width			0.46	mm
Wall Line Width			0.46	mm
Outer Wall Line Width			0.46	mm
Inner Wall(s) Line Width			0.46	mm
Top/Bottom Line Width			0.46	mm
Infill Line Width			0.46	mm
Skirt/Brim Line Width			0.46	mm
Initial Layer Line Width			95	%

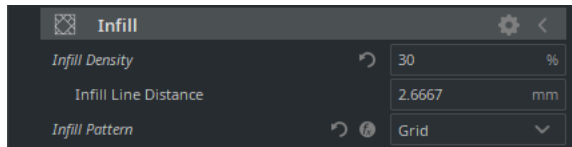
Section	Setting	Recommended Value	Comment
Quality	Layer Height	Between 0.12 and 0.24	No structural or precision gain by going lower than 0.12. But going higher than 0.24 might create issues with small holes and other fine details.
Quality	Line Width	0.46 (for 0.4mm nozzle)	I usually set this to be a little bit wider than the nozzle diameter. This ensures a better pressure of the layer against the part while providing a better finish I feel.

SHELL



Section	Setting	Recommended Value	Comment
Shell	Wall Line Count	3 to 4	I prefer setting this parameter over setting the wall thickness. 3 to 4 walls will provide solid parts.
Shell	Top/Bottom thickness	1mm	This means between 8 and 4 top and bottom layers, depending on your layer height.

INFILL



Section	Setting	Recommended Value	Comment
Infill	Infill Density	25-30%	Going higher than 50 % will not add significant strength for large components.
Infill	Infill Pattern	Grid or Gyroid	The advantages of gyroid infill over the tested infill types are: high shear strength, and low weight (so less filament needed).
Infill	Infill Before Walls	ON	With this setting enabled, infill will be printed before the walls. This results in better overhangs because the walls will stick to the already printed infill. Printing in this order can also have a disadvantage. If the infill is printed before the walls, there is a chance that the infill will be visible through the walls, resulting in a rougher surface finish.

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