Interface and Slicer Software

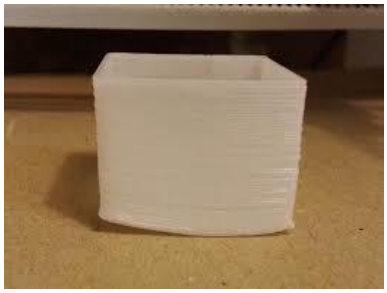
The software used to print a 3d object takes your well-prepared solid model and translates it in to a series of commands that tell the printer how, when, and where to extrude the filament. There are two basic software components necessary to print: the interface and the 'slicer'. The interface is the component that allows you to prepare the arrangement and orientation of elements for printing on a virtual platform. The 'slicer' is the component that breaks-down the model in to layers of a specified thickness and writes the 'g-code' that controls the path that the extruder will take on each layer, how much filament is extruded, extruder temperature, etc… Most 3d printing software packages have the two components integrated. Some interfaces come with a built-in slicer, but will allow other slicers to be used to generate the g-code. There are packages available that will allow as few or as many variables as the user can handle.

Regardless of the complexity of the software the user will have to specify the location and orientation of the part on the platform. Generally speaking, the objects should be built toward the center of the build platform. The orientation of the part is very important to achieving a good result. A part may be oriented differently depending on the desired outcome, but in general it should be oriented so that the greatest area is parallel to the platform.

There are a dizzying number of variables that can be can be manipulated to achieve one effect or another on the build. There are a few that seem to have more effect than others on the outcome of a build.

Platform temperature affects how well the model adheres to the build-platform. If the temperature is too low, the plastic, particularly ABS, will peel off of the build platform resulting in, at best warped parts and at worst a mass of disorganized plastic.

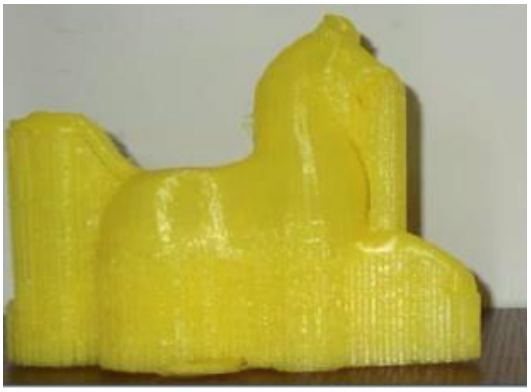
Extruder temperature effects how well the plastic will bind to itself as well as how well it binds to the platform. If the extruder temperature is too low the plastic will cool too quickly and the layer being extruded will not adhere to the previous layer. If the extruder is too hot, the layers that had been previously extruded will not have solidified before another layer is placed on top and will result in a warped model.



Build speed effects the way the plastic binds to itself almost as much as the extruder temperature does. An extruder moving too quickly will deposit

another layer before the previous layer has cooled giving approximately the same result as an extruder being too hot, as well as the inertia from a fast moving extruder can cause a part that is precariously oriented to topple over. The only effect that an extruder that is moving too slowly has on a build is the length of time that the build takes to finish. In general, a slower build speed will result in better quality.

The amount of support that a part has greatly affects both how well the part will build as well as the finish of the part. If a great deal of support is used the part is less likely to warp or tilt and topple over but it will also result in a great deal of scarring to the finish where the support has been removed as well as taking a longer time to remove.



While the rest of the variables that can be changed in the software have an effect on the outcome of a build, if the correct combination of temperature build-speed and support can be achieved the result should be an acceptable build.