3D Printer Setting Options

Fill Pattern

* Honey Comb & Triangular infills are the strongest infill patterns.
* Honey Comb infills have more uniform in-plane material properties than triangle infills, which tend to be strongest along the walls of the triangle.
* Our 3D printer recommends triangular infill for its pathing algorithm for speed and strength.
* Rectangular infill is generally the quickest infill pattern to print, but again our printer recommends using triangular infill for speed based on its algorithm.

Fill Density

* Increasing infill density improves component strength, but suffers from diminishing returns.
* Increasing from 75% to 100% infill density will increase the strength significantly less than an increase from 25% to 50% infill density.

Wall & Ceiling/Floor Layers

* Increasing the number of shell layers will improve the durability of a tapped holes.
* Increasing the number of shell layers also provides more viable material for post processing (eg, sanding).
* Increasing the number of shell layers can improve the wear characteristics of the part. Ie, by increasing the amount of material that would need to wear down before a critical failure occurs.

Layer Height

* Decreasing layer height improves the surface finish of the part.
* Increasing layer height improves the strength of a part.  This is because the weakest locations on a 3D printed part are between the layers.  The area between layers also tends to act as a stress concentration. It only take one defective layer for the part to have significantly reduced strength and stiffness characteristics.
* Increasing layer height provides more material for post processing in the z-direction.

Fiber

* See the material properties datasheet for a comparison of the fibers we have available.
* Adding fiber significantly improves the strength and stiffness of the part (>15x stronger and stiffer).
* Adding fiber around tapped holes significantly improves the quality of those holes.
* Adding fiber around the outside of a part makes the part more wear resistant.