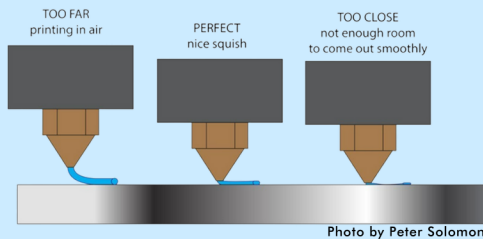


THE PERFECT FIRST LAYER

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BED HEIGHT

If the distance between the bed and the nozzle is too large, plastic will simply fall onto the build plate, cool too quickly, and will not adhere. If the Z distance is too small, the filament will look transparent or semi-transparent, causing clogs. The perfect layer height should squish and flatten to the line next to it but not form bulges or bumps. In general, closer is better than too far.



LEVEL BED

Bed leveling involves adjusting screws or feet to make the build plate parallel to the frame. The community often refers to this as leveling though it should be called cambering since the bed is parallel to the frame, not the floor. If the bed is not parallel to the X and Y axes, one section of the build plate could be level while another may be too far or too close. Bed leveling sensors (like the BL Touch) will help with this operation but will still require manual bed leveling before use.

Build Plate Material

Most users' first build plate is a gritty bed mounted on spring steel (stock on Ender 3's, AKA BuildTAK). This is an excellent beginner surface as the grit gives a mechanical tooth for the print to grab onto. The downside is that if your bed has a dip, your print may droop down and fail. A glass bed is an excellent upgrade as it tends to stay flat. Beware of fingerprints and oils that cause parts to fail. To keep it clean, wipe the surface with 70% isopropyl alcohol before every print. If bed adhesion is a problem, consider using a glue stick, blue tape, or hairspray.

BRIM OR RAFT?

For 3D prints that have limited surface area touching the build plate, consider using a raft or brim. A raft is a sacrificial plate under your print, while a brim increases the first layer's perimeter (like a hat's brim). A brim requires more post-processing but will give you a superior surface finish on the bottom of your print.

FLOW AND THICKNESS

Increasing the volume of plastic for the first layer will ensure it stays 'liquidy' for longer, leading to better bed adhesion. Increasing the first layer thickness to 0.28mm and flow to 125% will grab onto the build plate better.

FAN SPEED

Set the fan speed to 0% for the first layer and increase to 100% over the next 4 layers. This will allow the plastic to cool down at a slower rate.

SPEED

Slowing down the first layer often has the most significant effect. Set the speed to 7.5 mm/s for glass or 10 mm/s for BuildTAK for the best adhesion. These values are for worst-case scenarios and can often be increased to 20 mm/s or more for most projects.

BED AND NOZZLE TEMPS

To avoid warping and peeling, keep the difference in temperature between the nozzle and the bed as close as possible. Increase the bed temperature by 5° C for the first layer and reduce the nozzle by 5° C. If curling isn't an issue, increase the nozzle temperature by 5° C for lower viscosity.

