

What is the best « layer height » for your printer

A lot of questions can rise when it comes to tweaking our slicer parameters.

Adjusting the layer height value to have the best possible quality can become tricky.

What is the Max and Min layer height for my printer?

To answer this question we need to take into account the nozzle size of your hotend.

Printing with a layer height too low might cause the plastic to be pushed back into the nozzle and the extruder will struggle to push the filament. In the worst case the plastic can expand/react/change state inside the hotend.

Depending on your extruder, it can also damage the filament preventing it to properly push the filament.

Also in the opposite situation, if the layer height is too high, the layers won't stick properly to the previous layer resulting in a poor finish/poor rigidity of your 3D model.

An easy way to determine the Min and Max layer height is to apply this simple formula:

Min Layer height = 1/4 nozzle diameter

Max Layer height = 1/2 nozzle diameter

Once you have this calculated you can test to print a calibration pattern and adjust the layer height slightly.

Optimal layer height for your Z axis

Layer height also depends on your mechanics and electronic settings:

Indeed, the following things will impact layer height:

- Firmware Settings (micro stepping)
- Electronic settings (motors steps per turn)
- Z axis threaded rod steps

A great calculator is available online and it will give you compatible layer heights for your machine:

<http://prusaprinters.org/calculator/>

At the bottom of the page you will see « **Optimal layer height for your Z axis** »

This calculator helps to determine if the amounts of steps performed per layer height is an integer value.

As the firmware is only able to drive an integer amount of steps, using a layer height requiring a float value will cause a potential cumulative error (depending on the firmware) and the total height of your printed part can be smaller/higher than expected.

Scalar Family working layer heights with M8 leadscrews:

Those values will work for machines having a M8 leadscrew , 1/16 micro stepping and 200 steps/turn stepper motor (1.8°/step).

Inside firmware set EStep/mm = **2560**

They might also work with other hotends having the same nozzle diameters.

AllInOne 0.35mm Nozzle:

- 0.1mm
- 0.15mm

E3D 0.4mm:

- 0.1mm
- 0.15mm
- 0.2mm

AllInOne 0.5mm Nozzle:

- 0.1mm
- 0.15mm
- 0.2mm

E3D 0.6mm:

- 0.1mm
- 0.15mm
- 0.2mm
- 0.25mm
- 0.3mm

AllInOne/E3D 0.8mm Nozzle:

- 0.1mm
- 0.15mm
- 0.2mm
- 0.25mm
- 0.3mm

Scalar Family working layer heights with TR8x1.5 trapezoidal leadscrew :

Those values will work for machines having a Tr8x1.5 trapezoidal leadscrew, 1/16 micro stepping and 200 steps/turn stepper motor (1.8°/step).

In Firmware set EStep/mm = 2133.3

They might also work with other hotends having the same nozzle diameters.

AllInOne 0.35mm Nozzle:

- 0.09mm
- 0.12mm
- 0.15mm

E3D 0.4mm:

- 0.09mm
- 0.12mm
- 0.15mm
- 0.21mm

AllInOne 0.5mm Nozzle:

- 0.09mm
- 0.12mm
- 0.15mm
- 0.21mm

E3D 0.6mm:

- 0.09mm
- 0.12mm

- 0.15mm
- 0.21mm
- 0.27mm
- 0.3mm

AllInOne/E3D 0.8mm Nozzle:

- 0.09mm
- 0.12mm
- 0.15mm
- 0.21mm
- 0.24mm
- 0.27mm
- 0.3mm

Scalar Family working layer heights with SFU1204 BallScrew :

Those values will work for machines having a SFU1204 ballscrew, 1/16 micro stepping and 200 steps/turn stepper motor (1.8°/step).

In Firmware set EStep/mm = **2133.3**

They might also work with other hotends having the same nozzle diameters.

AllInOne 0.35mm:

- 0.06mm
- 0.08mm
- 0.10mm
- 0.12mm
- 0.14mm
- 0.16mm

E3D 0.4mm :

- 0.06mm
- 0.08mm
- 0.10mm
- 0.12mm
- 0.14mm
- 0.16mm
- 0.18mm
- 0.20mm

AllInOne 0.5mm :

- 0.06mm
- 0.08mm
- 0.10mm
- 0.12mm
- 0.14mm
- 0.16mm
- 0.18mm
- 0.20mm

E3D 0.6mm :

- 0.06mm
- 0.08mm
- 0.10mm
- 0.12mm
- 0.14mm
- 0.16mm
- 0.18mm
- 0.20mm
- 0.22mm
- 0.24mm
- 0.26mm
- 0.28mm
- 0.30mm

AllInOne/E3D 0.8mm:

- 0.06mm
- 0.08mm
- 0.10mm
- 0.12mm
- 0.14mm
- 0.16mm
- 0.18mm
- 0.20mm
- 0.22mm
- 0.24mm
- 0.26mm
- 0.28mm
- 0.30mm

Those values are given as information purpose and some parameters might not work with some materials/colors etc...

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Use them as a starting point to calibrate your printer.