

foam 3d printer

July 20, 2022

Contents

1 Printers

1.1 Prusa MK3s+ <https://www.prusa3d.com/product/original-prusa-i3-mk3s-kit-3>

1.1.1 Pros

- known for slicer quality
- community
- professional level tool
- gold stndard
- speed
- enclosure available

1.1.2 Cons

- long lead time 3-4 weeks

1.2 Pulse 3D Printer <https://www.matterhackers.com/store/1/pulse-3d-printer/sk/MH4C92XW?aff=7512>

1.3 Ender 3 S1 Pro <https://www.creality3dofficial.com/products/ender-3s1-pro-3d-printer>

2 Components

- leveling sensors

- extruders

3 Rating

3.1 Hot Ends

Printer	Hot End	Max Temp.	Responsiveness/Material	Power	Options
Prusa	E3D V6	300C	Alu Copper	30W	up to 500C w/upgrade
Ender	Sprite Pro	300C	Alu	n/a	n/a
Pulse	E3D V6	300C	Alu Copper	30W	up to 500C w/upgrade

- heater materials are kind of ambiguous/not much information provided, can only assume that the copper alloy is going to be more responsive in terms of dissipating and transferring heat
- Ender can be upgraded to E3D V6
- just from brief googling E3D has much better documentation

3.2 Extruder

Printer	Drive	Weight
Prusa	Direct	
Ender	Direct	
Pulse	Bowden	

- weight can contribute to overshoot/ringing/ is generally bad
- TPU and other flexible filaments can be printed using a bowden setup but not easily, direct drive certainly much better

3.3 Other

Printer	Levelling Sensor	Documentation/Support	Community	Max Bed Temp	Printing
Prusa	Inductive (pinda)	Good	Large	120C	80 mm
Ender	Hall Effect (CR Touch)	Not Great	Large	110 C	60 mm
Pulse	Hall Effect (BL Touch)	Exists	Exists	115 C	60 mm

- hall effect levelling sensor may be a must with garolite printing bed and TPU adhesion, induction sensor still works but added bed thickness (above metal bottom) is limited

3.4 Slicers

- all slicers seem to be based on the same CUSA engine and are all open source
- any slicer, since it is onyl producing G-CODE can be modified via code langauge of choice post process
- Prusa slicer features preloaded presets for materials, etc, this is not seen as valuable in this instance as the project is using custom materials and possible slicer modificaitons

3.5 Motion

- prusa is considered more accurate motion system, especially for small parts
- prusa uses better bearings and not rubber wheels like ender

3.6 Motherboard/Computing

- both prusa and pulse are 8-bit, where ender is 32-bit

4 Risks

4.1 Venting

- venting is required for most printing filaments
- nothing crazy usually a fan out the window or similar
- highly ventilated room is also acceptable

4.1.1 Materials

- nylon (Caverna)
- abs
- TPU (varioshore)

4.2 Hardware

4.2.1 levelling

- avoid inductive type leveling sensors as only works with metal bed materials, may not be suitable for filaments in mind leveling sensors

4.3 Misc

- delivery
- ender hot end may not be responsive enough given aluminum only heating block
- availability of correct bed surfaces for TPU adhesion, can also use glues on normal or glass beds
- varioshore STARTS foaming at 230C, will 300C be enough to fully observe its properties?

5 Important params

- hot end control and response - titanium for ender both up to 300 degreesC
- motion accuracy - prusa big advantage rubber vs solid and bedding
- extruder both good but prusa not metla
- prusa much higher motherbord - prusa may struggle with tough g code
- stepper drivers similar support sensorless homing only on prusa
- prusa lightweight bed and auto level same bed on ender but manual levelling 110 deg ender vs 120 deg prusa
- prusa best levelling sensor
- ender has some dumb extras like lights
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- prua much more accurate

- both can extrude the same filaments
- prusa 80mm/min, 60mm/min for ender
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- prusa has much better software/firmware
- prusa specific slicer
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- prusa wins big on documentation

5.1 Extruders

5.2 Hot Ends

5.2.1 Speed

5.3 Slicers

5.4 Community/Support

5.5 Leveling Sensors

5.6 Motion Accuracy

5.7 Motherboard/Computing

5.8 Bed

5.9 Addons