

3D PRINTING CHEAT SHEET

PRINTING STEPS

- Design a Part
- Export to slicer
- Slice
- Export to host interface
- Print

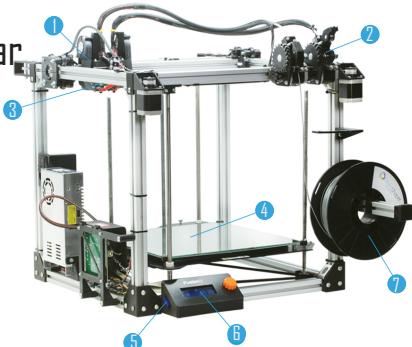
GETTING STARTED

Finding the Right Printer

Your budget is the first thing to consider when searching for a 3D printer. Keep in mind that you won't just be buying the printer, but the filament for your prints. You will need to consider size, cost, print quality, available materials, and software. Some factors are less important than others. Size for example can be overcome by breaking large parts into separate files.

The Anatomy of a 3D Printer

- 1 - Cooling Fan
- 2 - Filament Drive Gear
- 3 - Hot End
- 4 - Print Bed
- 5 - SD Card Slot
- 6 - User Interface
- 7 - Filament



Calibrating a 3D Printer

Check if your printer has pre-loaded calibration software, recommended calibration software, or auto calibration. One of these ways will walk you through leveling your bed. In addition to calibration software, your printer may also come with a pre-loaded test print. If not, thingiverse is a great resource to find test prints and other people's creations. A test print will allow you to gauge the approximate quality of your printer and ensure that it is calibrated correctly.

FILAMENT TYPES

When deciding what filament to use you want to take into consideration, accessibility, material, color, price.

PLA VS ABS

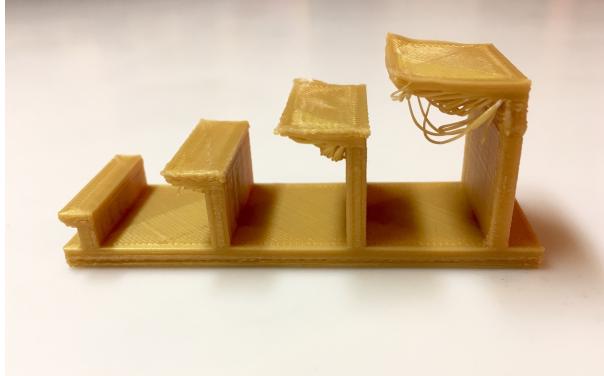
Easier for beginners to use.	End products are stronger and more durable.
Faster printing speed.	End products have a longer lifespan.
Easier to remove from the print bed.	Has a higher melting point.
More prone to clogging to jamming the hot end.	More prone to warping.
Can easily melt.	Ventilation is needed during printing.

PREFERRED SETTINGS

Support and Overhangs

Support is a necessity that you will have to deal with at some point while printing and there are many different ways you can do it. First, you must decide how you will support your part. You can either use the same filament you are already using to create the base part, or you can use a specialized support material in conjunction with a dual extruder. Specialized support materials are often dissolvable in water or a solution sold with the plastic to eliminate the hassle of removing it manually. A good thing to remember when considering overhangs is the 45° rule: If an overhang is greater than 45°, it will most likely need support.

Pro Tip: Some overhangs can be avoided with chamfer/fillets, which can also strengthen your part - if it doesn't interfere with other parts.



Clearance

You will need to ensure that any holes or parts that fit tightly together have enough clearance to fit easily. For holes, about 0.02" is usually added to the diameter. For polygons 0.01" is usually added to any sides that fit into others.

Platform Adhesion

One problem you may encounter while printing is your part's base lifting up slightly around the edges during the print. This creates an unlevel face, and can disturb surrounding parts. To fix this, you can use brims, rafts, or neither in your slicer.

Rafts



A raft is the strongest and largest type of adhesion, uses the most plastic, and is generally the best at preventing lift off the bed. consideration each time.

Brim

A brim uses a lot less material than a raft and also helps to prevent lifting, but not quite as effectively.



Neither

Not using extra adhesion can be risky, but some prints do not require any.



Selecting the type of adhesion should be taken on a print by print basis and needs careful consideration. Another method of increasing adhesion is using tape on your bed. Some options are painter's or kapton tape. Lay strips of tape on your bed to cover the area you are printing on, then you can begin to heat the bed and continue preparing for printing.