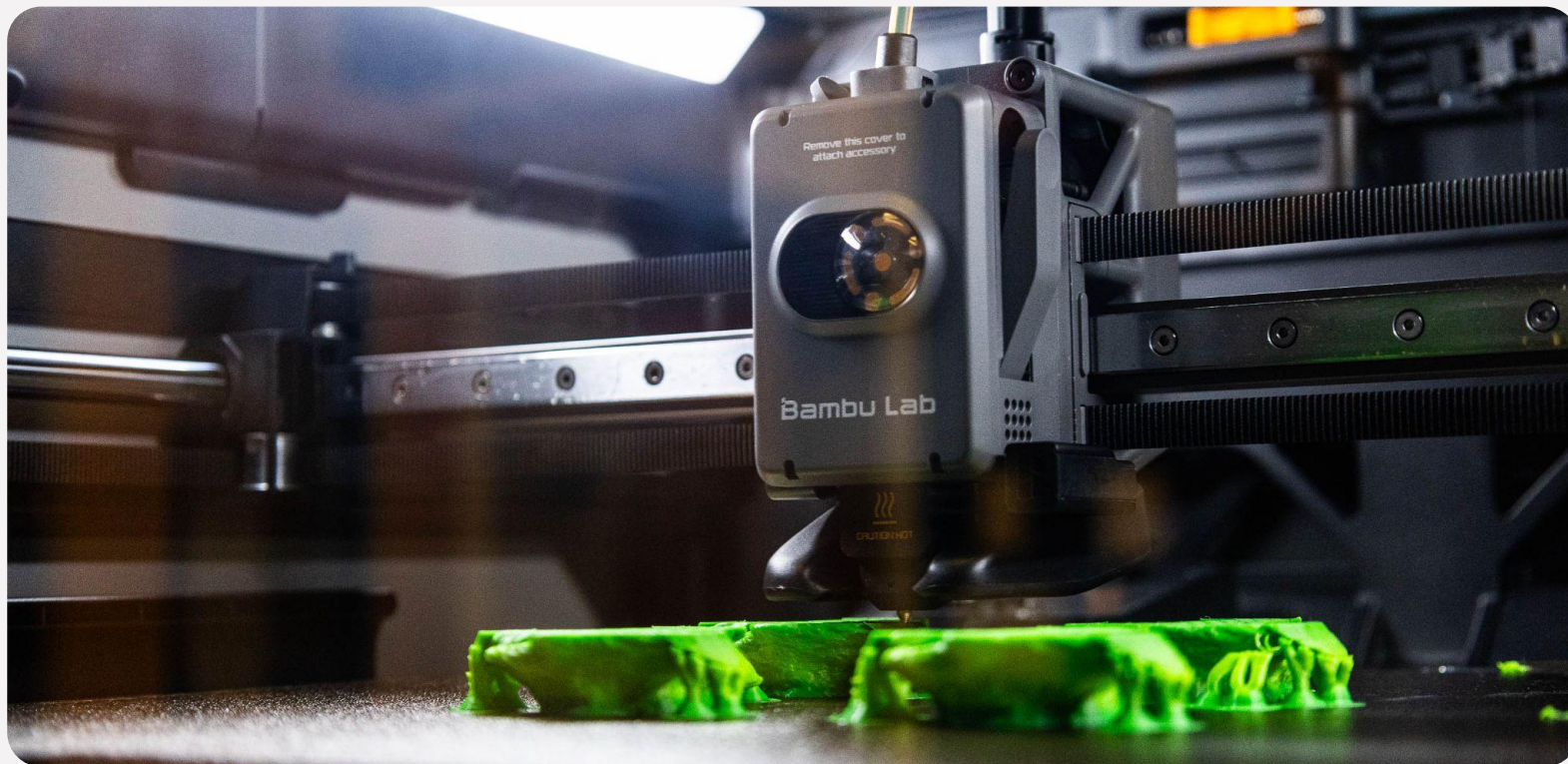


INTRO TO 3D PRINTING



Where can I 3D print?

Coram Library

The VizLab is located on the ground floor of Coram (the old library in front of Ladd). Just walk in and you'll see the signs!

The VizLab also supports other technologies like Laser Cutting and Virtual Reality.

Coram Library also houses the Immersive Media Studio, a multi-projection exhibition and performance space.



VizLab Printers

Type

Description

Use Case

H2S

Our standard single-nozzle printer. Can use up to four colors per print via AMS. Has the largest print volume! There are three of them.

- Beginner printing
- General printing

H2D

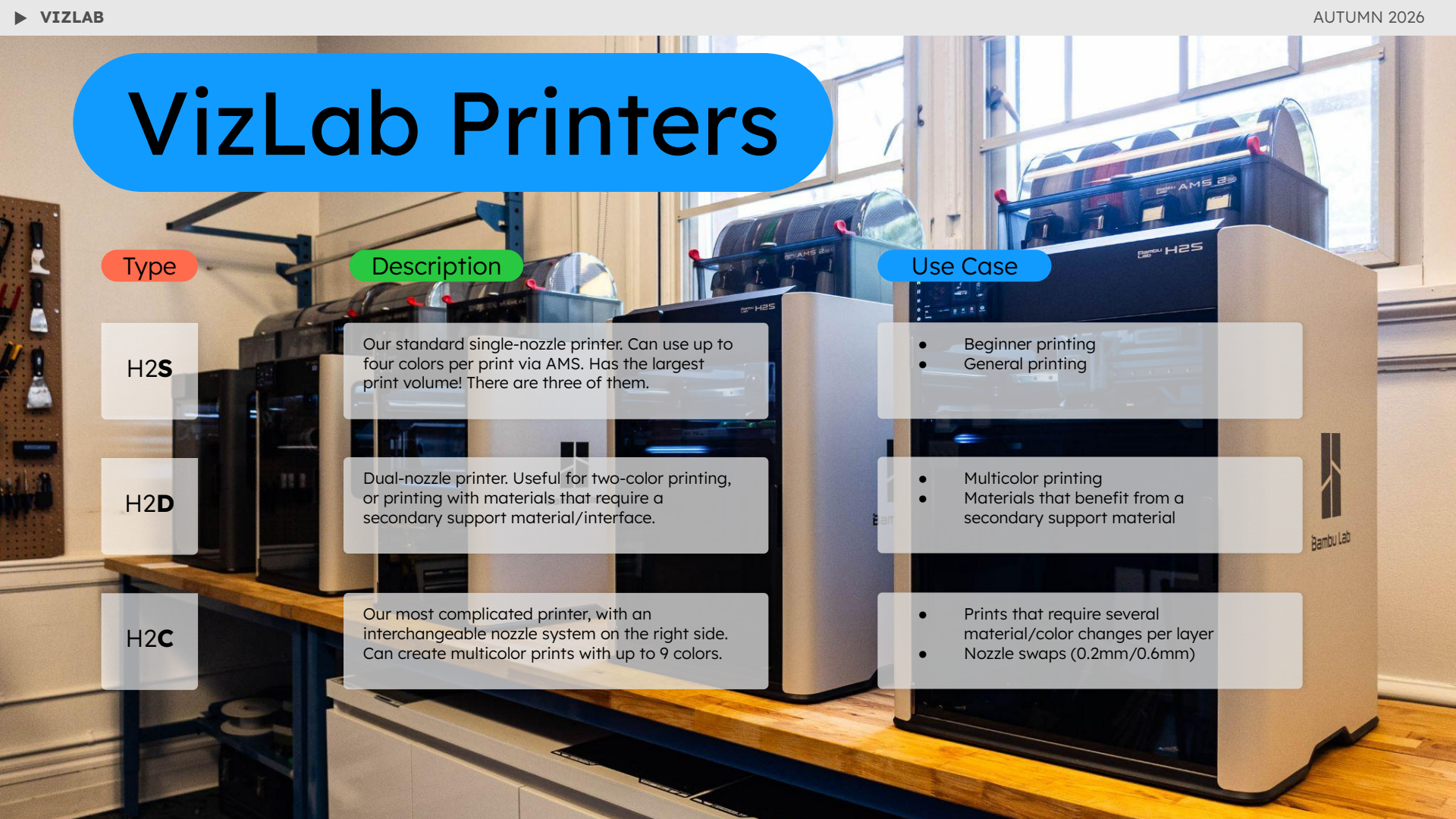
Dual-nozzle printer. Useful for two-color printing, or printing with materials that require a secondary support material/interface.

- Multicolor printing
- Materials that benefit from a secondary support material

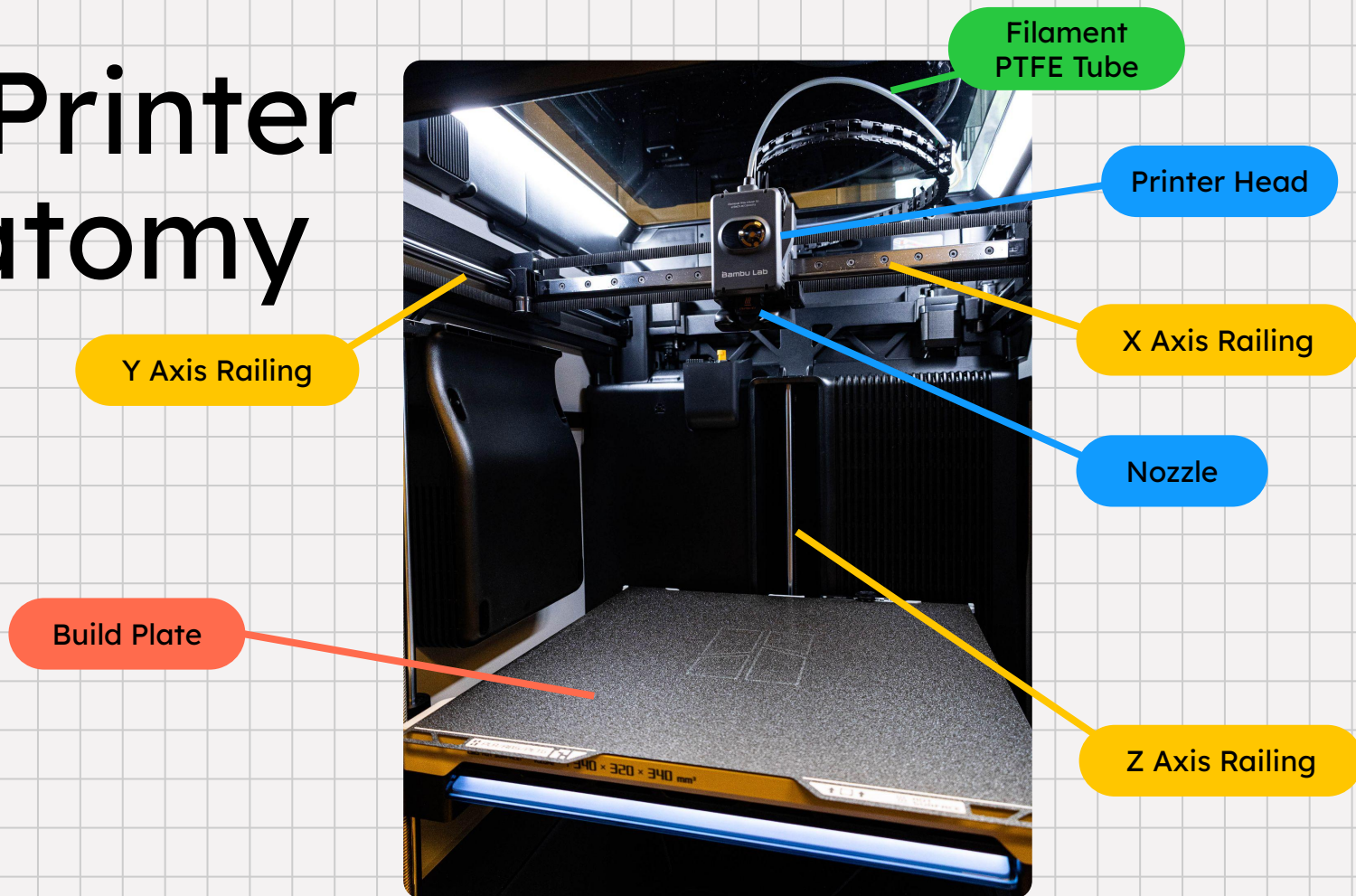
H2C

Our most complicated printer, with an interchangeable nozzle system on the right side. Can create multicolor prints with up to 9 colors.

- Prints that require several material/color changes per layer
- Nozzle swaps (0.2mm/0.6mm)

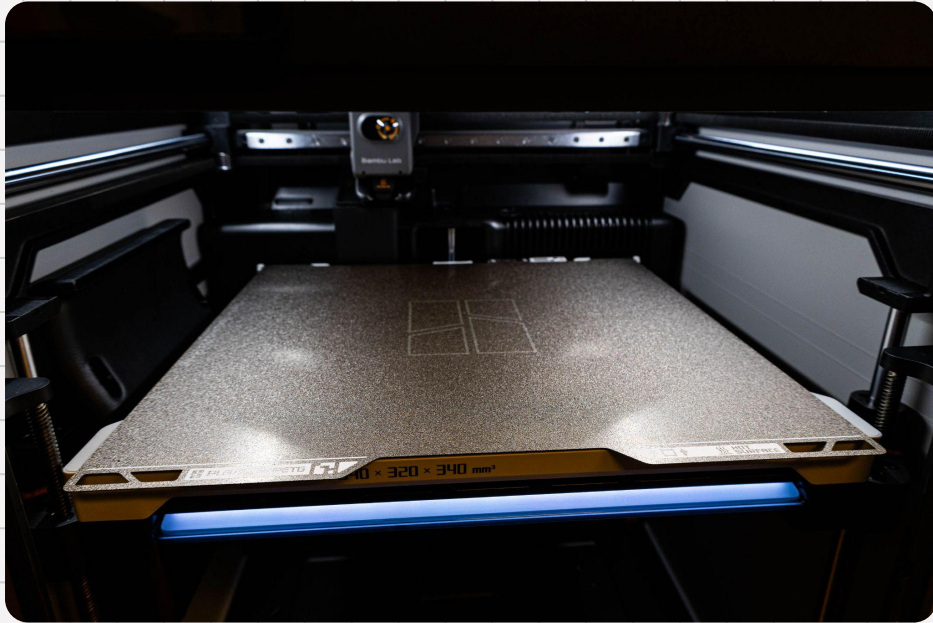


3D Printer Anatomy



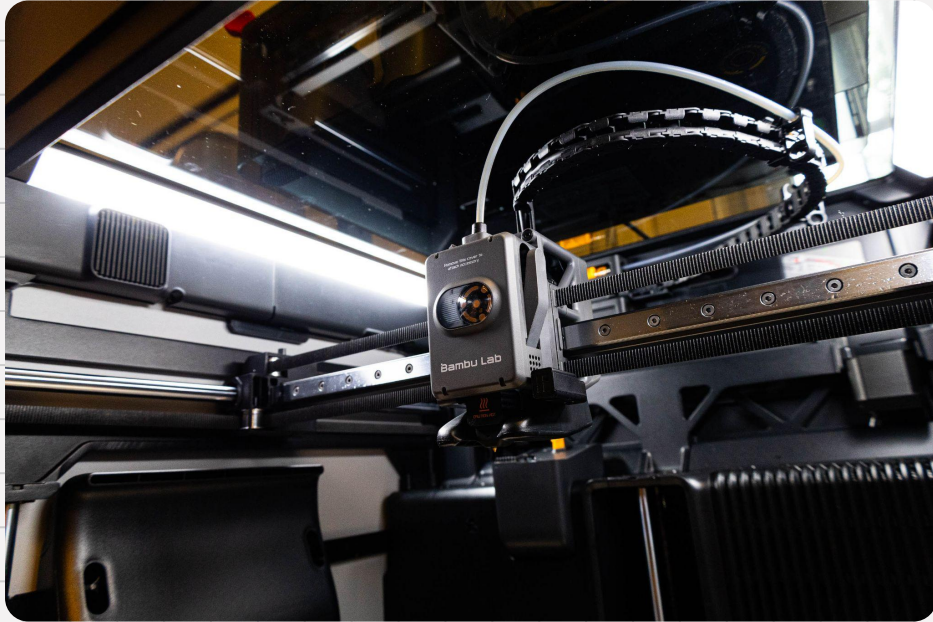
Build Plate

- Magnetic and removable - grab it by the edges and pull upwards
- MUST be lined up properly in the printer
- Clear all materials after each print
- Different surface options: Textured PEI, Smooth, Supertack, Engineering plates; must match settings in slicer
- H2S and H2D plates are interchangeable; H2C uses unique build plates
- Clean plate with hot water and dish soap



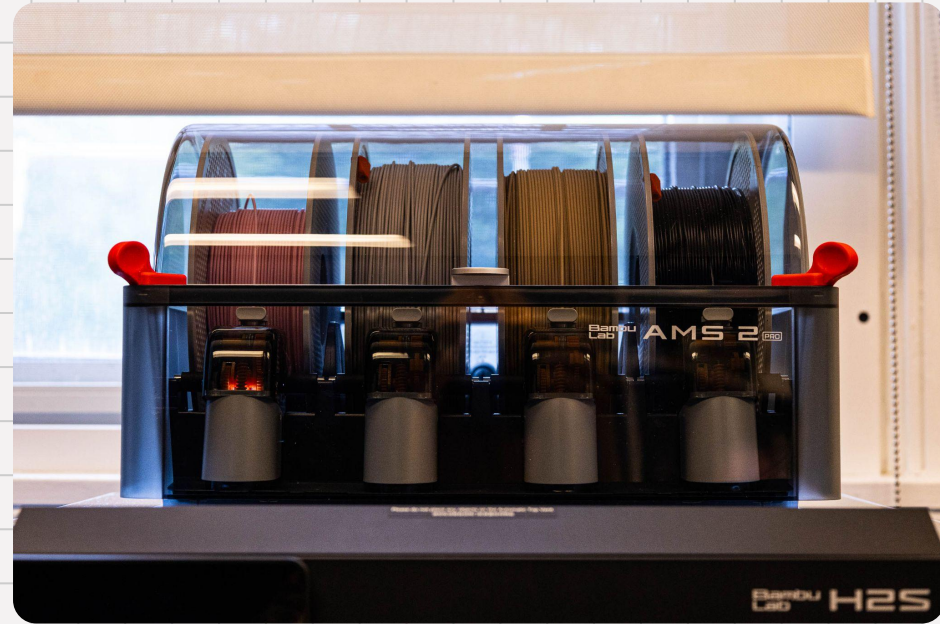
Printer Head

- Feeds filament into the nozzle
- Default nozzle size: 0.4mm; smaller nozzles increase detail and larger nozzles increase print speed
- Nozzles can get clogged/jammed; some filament is only compatible with certain nozzle sizes, check product information
- Consult with a staff member or student worker to replace nozzles

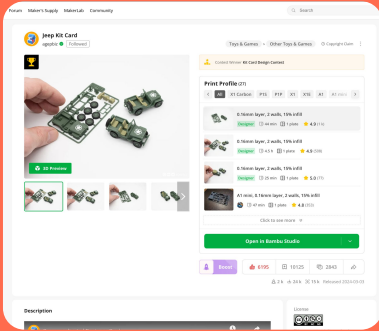


AMS

- Manages different filaments to be loaded into each printer
- To load, push tip of filament into the loading mechanism; the AMS will continue to pull the filament into position
- To unload, pull the filament upwards
- **NEVER** let the filament unspool itself. Always keep a hand on the tail end of the filament and clip it to the side of the spool when not in use with a filament clip.

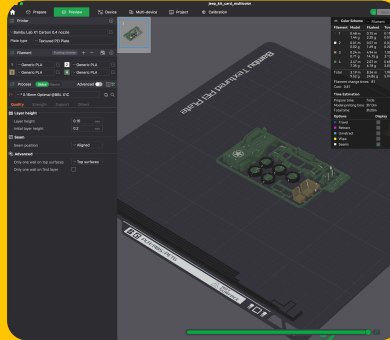


3D Printing Workflow



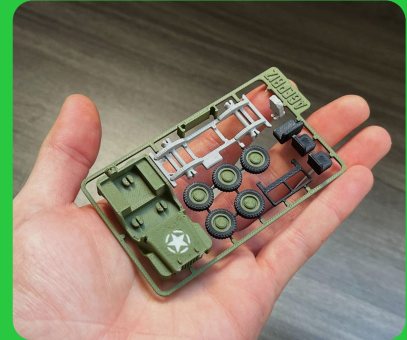
SOURCE

Find a model online, or build your own from scratch using 3D modeling software.



SLICE

Translate the 3D model into a set of instructions for the printer to create, layer by layer.



PRINT

The 3D printer follows your sliced file instructions and prints your model.

Model Sourcing Resources

FIND

- Makerworld (Bambu Lab)
- Thingiverse
- Printables
- Sketchfab
- Thangs
- Yeggi

CREATE

- Tinkercad
- Autodesk Fusion
- Blender
- OnShape
- Solidworks
- Sketchup

Not every 3D file is 3D-printable!

Interested in tips for 3D design optimized for 3D printing?

[Rahix' blog: Design for 3D Printing](#)



- Extraneous details
- Large overhangs requiring complex supports
- Models with floating objects
- Fine details on objects scaled down

What can go wrong? (a lot)

SPAGHETTI

If part or all of your print fails to stay attached to the build plate, the printer will put out material without anything underneath to support it. This can result in strings of filament attached to a partially completed print, or even worse, the printer just puts out pure “spaghetti” for hours. Fortunately, our printers can often detect when this is happening, and pause the print to confirm.

WARPING

When printing large flat surfaces on the build plate, corners of the print can sometimes warp upwards over time. This depends on a few factors, including the evenness of the build plate heater, the plate temperature, and air flow through the printer. It can be an issue with PLA, but it’s especially problematic with ABS/ASA materials. One solution can be to put down a lot of glue on the build plate.

DIRTY PLATE

It’s important to keep the build plate clean, and not touch it with bare hands whenever possible. Oils from our skin can cause visible issues with the surface layer of a print. If the build plate appears dirty, wash it in the sink with warm water and dish soap (with the textured PEI plate, make sure to scrub thoroughly into the textured surface). A clean build plate will solve most of your problems.

WET FILAMENT

Dry filament is extremely important to produce a successful print. If the filament is wet, you will see stringing (like spider webs) between components, rough slopes, and generally a sloppy looking print. All of our AMS units can be used to dry filament when not in use. It’s a good idea to plan ahead and dry filament for a specific project overnight whenever possible. Engineering filaments and TPU **MUST** be dried before use.

Filament Materials

Type	Description
PLA	Our most common material. An inexpensive biodegradable material that is easy to print with and works well for multicolor printing and rapid prototyping. It is structurally weak and shouldn't be used for objects under load, in heat, or outdoors. Variants include silk, metal, CF, marble, wood, etc.
PETG	Similarly easy to print with like PLA, but offers stronger structural abilities. It costs more than PLA and has fewer variant options.
ABS	Much harder to print with, and requires heating the entire chamber. Toxic to breathe while printing. Extremely strong and durable, ASA variant for outdoor use. Parts may shrink when cooling, which can cause issues.
TPU	Rubbery flexible material. Can be difficult to set up printer to use, only "TPU for AMS" can be used in the AMS. Variants include different densities for flexibility.

What projects do we support?

Access is **always** prioritized for class projects and academic use over non-academic printing!

- Independent faculty research
- Course workshops and projects
- Student thesis projects
- General Bates community walk-ins

The VizLab is a learning space open to all members of the Bates Community. You can print whatever you'd like* as long as you're learning from the process of making it.

**no weapons*

Contact Us



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Support Hours

Weekdays 9-4 (generally)

Precise Student Worker
schedule posted each
semester outside the VizLab
door!