

3D Printing with Afinia Studio

The School of Education and Human Development (EHD) Maker Studio (Ridley 204) has five Afinia H400 3D printers. This provides one 3D printer for each two-person team in a maker class with ten enrolled. The Afinia 3D printer has a high efficiency particulate air (HEPA) filter that removes up to 99.97% of airborne particles that are 0.3 microns (μm) or greater in size.

Afinia Studio is the software used to send a 3D CAD model such as an “.stl” (stereolithographic file) to the 3D printer. This type of software is known as a *slicer* because it converts the 3D model into series of layers. Stepper motors controlled by a microcontroller move the head of the 3D printer that extrudes melted filament along a *tool path* to create each layer. In effect, a filament-based 3D printer is a giant glue gun. The microcontroller software makes precision control of the tool possible. Microcontrollers, therefore, made affordable 3D printers possible.

Slicer software typically can be used to control factors such as the position, orientation, and scale of the object to be printed. In addition, the Afinia Studio slicer software controls the fan of the HEPA filter. The Afinia printers should never be operated with the door open, so that the filter can remove particulate matter as the exhaust fan draws air through the heated chamber. HEPA filters require periodic maintenance and replacement. Therefore, the lab manager should be notified if there appears to be a problem with proper operation of the 3D printer.

This guide describes the process of using Afinia Studio to send a 3D CAD model to an Afinia 3D printer. The software will indicate how long a printer is likely to take. Even a small object can take several hours to print. In addition, depending on the orientation of the object and other factors, errors can sometimes occur that cause a print to fail. Therefore, plan accordingly and include time for an object to be printed when working on a project.

This guide describes how to load a 3D CAD model into Afinia Studio, adjust its properties such as scale, orientation, and position on the print tray, and print the 3D object.

Installation

To download Afinia Studio, visit the link below and select the appropriate option for your operating system (Mac or Windows).

<https://afinia.com/support/downloads/afinia-studio-software-download/>

Once the download has completed, run the installation file. (If your computer flags the installation application as an unknown file, click *More Info* and then *Run Anyway*.)

Setup

1. Connect your computer to the printer via a USB cable and turn the printer on. The power switch is located on the bottom left of the back side of the printer.
2. Open Afinia Studio
3. Select Build from the menu on the left of the screen.



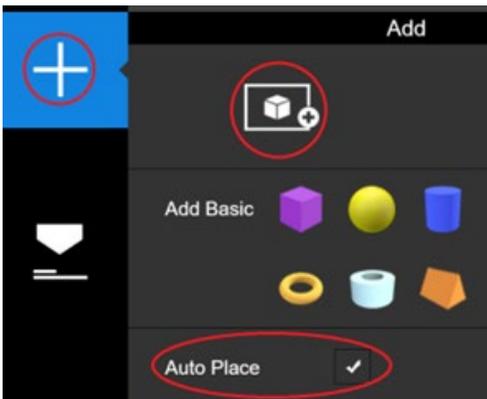
4. Select the *Initialize Printer* button from the menu on the left of the screen. Once the printer has been initialized, the text at the top of the screen should change from *Printer not Initialized* to *Printer Ready*.



Printing

The file to be printed should have an “.stl” extension.

1. Click *Add* from the menu on the left side of the screen. Select *Auto Place* and then click the *Add 3D Model* icon.

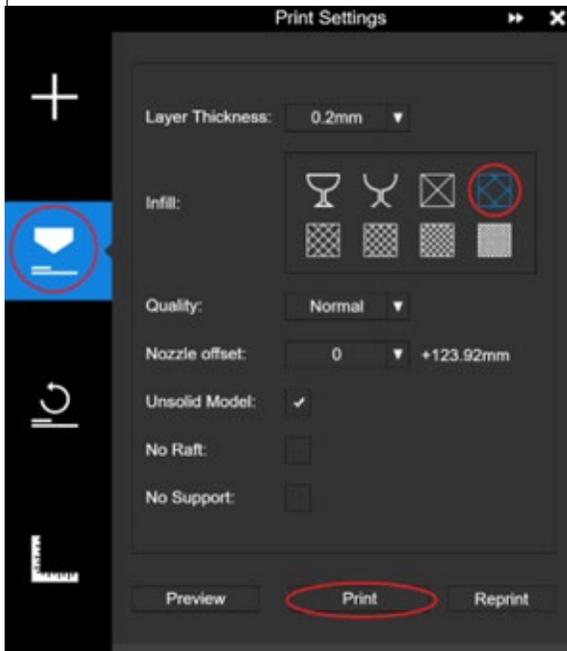


2. Locate the .STL file to be printed, select it, and click *Open*.
3. The control wheel shown in the illustration below can be used to select options such as *scale*, *rotation*, *positioning*. Use these options to scale and position the object on the print tray.



4. Select *Print* from the menu on the left side of the screen. The infill option determines how porous the object will be. (An infill setting of 100 % would produce a solid object.) In many cases, an infill setting of 15 % will print a usable object. This saves time in the printing process.

Select the desired infill level before printing. Do not change any other settings.



5. Select *Print*.
6. To save the file, select *Preview* and then *Save to File*.
7. Turn off the printer once the print is complete.
8. To remove the print, open the door and pull the print tray to the front of the printer. If necessary, remove the print tray by continuing to pull it forward. Once the print tray has been removed, it can more easily be separated from the print.
9. Replace the print tray in the printer.
10. Turn the printer off.