

# QUICK REFERENCE GUIDE

## WVU TEACHING & LEARNING COMMONS SUPPLEMENTAL GUIDE FOR FLASHFORGE DREAMER 3D PRINTER

### BEFORE YOU PRINT

There are quite a few steps that you need to check before you make a print. Some are optional and some are mandatory. This part of the guide will cover the steps with the machine, not setting up the file for print. I'll try to list things in order they should be checked, and mark the optional things.

### SETTING UP THE PRINT BED

The quality of a print has many factors, but a stable bed with the correct strata for the medium being used is one of the most important. From my research and testing, I have found 2 methods that seem to give the best results for this machine. You need to lower the print bed enough to be able to remove the glass, but high enough to access the right foremost wingnut. This can be accomplished by going into "Tools", then selecting "Move" from the sub-menu. The x-axis is right-left, y-axis is forward-backward, and the z-axis is up-down, all viewed from the door of the machine.

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### FOR PLA PRINTS

If you are printing in PLA, remove the glass sheet, which can be done by loosening the foremost right wingnut on the corner of the print bed. Once the 3D printed corner becomes slack, gently lift the glass out of the brackets. With the glass out of its bracket, take the blue roll of painter's tape and line the top surface with the tape. It is important for leveling purposes to minimize the amount of tape that wraps around to the backside of the plate. There is a hobby knife in the tool kit that can be used to cut the tape to achieve a better fit. Once the tape is placed, reposition the plate on to the print bed, and retighten the wingnut on the right foremost corner until the plate is firmly held in place and flat against the print bed.

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### FOR ABS PRINTS

ABS will stick better to a glass surface, so if you are printing in ABS, you do not need to add blue tape to the glass. Make sure that the glass is clean and has no residue that may affect the print quality. If the glass needs to be cleaned, loosen the right foremost wingnut and remove the glass from the brackets. Using acetone and a clean, lint-free cloth, wipe the surface of the glass to remove any debris. Allow the plate to dry completely (this will be quick) before reinstalling it into the brackets. Acetone WILL degrade any ABS it touches, including the brackets that hold the plate! For this reason it is advised to remove the glass before cleaning to protect all 3D printed parts. Reinstall the cleaned plate into the brackets, and make sure it is flat against the print bed before retightening the wingnut that holds the plate in place. After tightening, insure that the plate is held firmly in place.

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### LOADING AND UNLOADING FILAMENT

If you wish to change the filament type or color for the upcoming print, start by lowering the print bed out of the way. The only position we are concerned with at this point is that the print bed is low enough to allow a few

inches of filament to descend from the nozzle while we are loading the print head. Once the print bed is out of the way, we are ready to proceed.

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## UNLOADING FILAMENT

To unload filament take a sharp knife and score the filament about 4 inches from the port where the filament loads into the print head. You don't have to cut it completely, as a light score will cause a break at that point with a light bending pressure. Snap the filament at the score line, and re-roll the unused portion back on to the spool. With the spool rewound, remove the pin holding the spool in the machine by turning it and pulling it out. Remove the spool and place the free end into the hole located in the wall of the spool to keep it from unwinding. Next, select the "Tools" sub-menu on the main screen and then select "Load/Unload filament." Select unload at the next menu. At this point, the nozzles will heat to allow the filament to slide free. Watch the progress bar until the heat reaches the top of the bar. At this point you will hear a motor driving the filament out of the print head. Gently pull the filament to guide it up and out of the print head, and discard any remnants you pull out. Hit the back button on the touchscreen when you've finished removing the filament to return to the "Load/Unload" menu.

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## LOADING FILAMENT

To load filament, place the spool of your chosen filament into the spool holder, push in the axel pin, and lock it into place. I've found it's best to place the spool such that the filament is pulled from the bottom of the spool. Route the filament through the plastic tubing that goes up and out of the machine. Take the end of the filament, and place it in the top of the print head on the side corresponding to the spool. Press down on the small lever on the corresponding side and feed the filament deeper into the print head. You should feel tension on the filament after releasing the lever. Select "load" on the printer and wait for the nozzle to reach the proper temperature. When the bar fills, you'll hear a motor trying to feed the filament. If loaded properly, you'll see material extruded from the print head, and the filament being fed into the print head. If not, depress the lever and press the filament farther into the print head. You should feel the motor grab onto the filament and slowly pull it into the print head. Allow the material to pass through the nozzle for several seconds to insure that it is properly loaded before pressing back to exit the loading program. Gently pull the excess material off the print nozzle (it should be cool enough lower on the material, do NOT touch the nozzle, or near the nozzle.)

## LEVELING THE PRINT BED

Leveling the print bed is another major factor in the quality of the print. It can cause many different problems if not properly calibrated. I would suggest that this is done at the beginning of any print session, after a few prints, and of course if any modifications such as switching filaments or adding/removing tape or cleaning the print bed. To start leveling the print bed, go into the "Tools" menu and select "Level." The print head will move around and stop at the front center of the print bed. Locate a small, thin sheet of plastic with the English instructions on the front and Chinese instructions on the back. The thickness of the sheet is the recommended stand-off distance for the print nozzle. For a good demonstration of this, watch

<https://www.youtube.com/watch?v=0FRduptbxpl>

## PRINTING AN OBJECT

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## SETTING UP A FILE FOR PRINT

Open the FlashPrint software (also known as the slicer) and load in the .stl file of your choice. Click on the object and then click on extruder, choosing either left or right depending on which extruder has the filament with which you want to print the object. The model will change color accordingly. Make sure that the object is as centered as possible, and on the print bed. The software will give you a warning if you forget this step. Once you have done this, click on the print button. A dialog box will open and you'll have many options to set up. Set the material left/right to correspond with the filament that is loaded in the machine (either ABS or PLA), and select the resolution you would like. Printing with supports is a good idea for any object with overhanging parts. At the bottom of the dialog box, click on temp next. Make sure that the values that correspond to the type of filament you are using are there. Usually, you want to set the temperatures between 180°C and 200°C for PLA, and 200°C and 240°C for ABS. Next you'll want to set the platform temperature as well, usually 50°C for PLA and 110°C for ABS. Make sure you do not heat the bed above 50 C if there is blue tape on it! It is recommended to look up the best printing temperatures before slicing the file for your chosen filament, which is sometimes listed on the side of the spool, or online. Clicking OK will make a file, which you then transfer to the SD card using the USB adaptor in the 3d printing cart.

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## PRINTING A FILE

The drivers for connecting to the printer over USB don't work on any of the machines we've tried to use, so printing from the SD card is the preferred method currently. Load the file onto the SD card from the slicer and place the SD card into the printer. Press on the Print icon, then select the center option to access the SD card. Scroll through the list until you see the filename of the file you'd like to print, and then press "Yes" to confirm the print. The printer will go through a heating cycle and then start to print.

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## THINGS TO WATCH OUT FOR DURING A PRINT

While the printing process is automatic and requires nothing from you, checking in every few minutes to make sure that things aren't going astray is a good idea. Specifically, you should watch the beginning of the print to make sure the first layer goes down well. Sometimes, the first layer snags on itself and gets pulled up by the passing nozzle. This usually indicates that the print bed is not level. You should also double check to make sure that the print bed is the correct type (blue tape for PLA, glass for ABS.) If at any time the printing goes wrong, cancel the print, wait for the nozzles to cool, and make corrections.

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## OTHER NOTES

This is a living document and additional information will be added when deemed useful. For a full guide, FlashForge provides a user manual on their website, <http://www.flashforge-usa.com/>

For more information, contact West Virginia University's Teaching & Learning Commons at 304-293-5824.