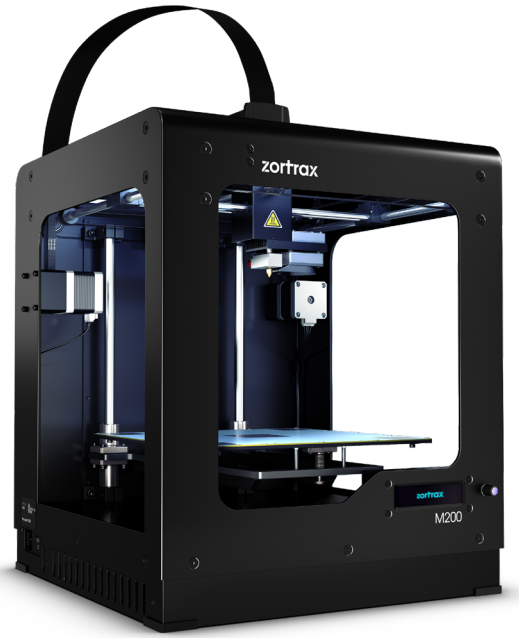
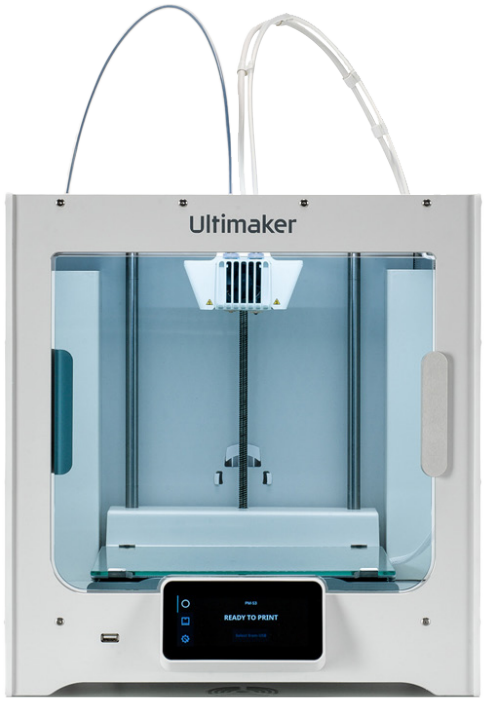
3D PRINTING AT THE BAC





3D PRINTING
HOW IT WORKS

1

RECOMMENDED PROGRAMS:
Rhino models are great
Sketchup models are ok
3DS Max models are ok
AutoCAD 3D models are ok
Revit not recommended

2

MODELS MUST BE CLOSED, SOLID AND WATERTIGHT AND HAVE NO PARTS THAT ARE BELOW .5MM/.03” THICK
A closed model is one without open edges
A solid model has no coincident or intersecting geometry
A watertight model is one that, if insides were filled with water it would not leak

3

Turnaround Time:
Due to many variables in the 3D Printing process, we cannot guarantee a delivery time
Printing is determined by queue and is on a first-come, first-printed bases
During midterms and finals it can take a week to obtain your print
We do not print overnight as hour printers need to be monitored
Print jobs are limited to 10 hours per job, and 10 hours per student per week during midterms and finals

3D PRINTING POLICIES

1

APPROVED OPERATORS:

APPROVED TO MAINTENANCE 3D PRINTERS
Ezy Pompilus
Vladimir Pierre-Louis

2

APPROVED USERS:

Any student, Faculty, or staff of the BAC **who has read and understood** this document

3

APPROVAL REQUIRED:

1. To have your printer files printed by Coder they must be approved.
2. To be approved go to room 405 during regular hours
3. **We do not accept 3D prints by email**
4. If we point out errors/ problems with your file that you do not want to take the time to correct, we may refuse to print your file or if we do print your file, we will make only one attempt and may stop the print at any time, if it looks like it will degrade the performance of the 3d printer.

4

MATERIALS AND PRICING:

1. We print with both ABS and PLA
2. Black, White,Grey are available in the free printing area
3. Printing with Coder is 10 cents a gram
   Zortrax available colors Black, White, Grey, Yellow, Red, Blue, Orange, Pink, Transparent, Neon Pink
   Raise available colors Black, White
4. Models are weighed after printing and taken out of print account funds.

3D PRINTING
FILE SETUP TIPS

1

SIZE AND ORIENTATION:

1. Make sure you scaled model fits inside the Zortax(7.5 x 7.5 x 7”) or Raise 3D(12 x 12 x 11.5”)
2. Make sure your model “sits flat” on the c-plane - this is very important!!!
3. If possible, orient the model so the most supported side is facing down
4. Scale your model to print-size before exporting the .stl or .obj
   (it needs to be in inches or millimeters- millimeters preferred)

2

GEOMETRY-BASICS:

1. 3D printers can’t make zero-thickness planes-everything needs a thickness
2. “Open” shapes are ok, but they need wall thickness - **RECOMMEND .5MM MINIMUM**
3. Models should be “**WATER TIGHT**” - if it’s not water tight, it’s not a solid, and won’t print well
4. Clean up coincident geometry - don’t have shapes inside of other shapes

3

GEOMETRY - OVERHANGS AND SLOPED SURFACES:

1. The Zortrax and Formlabs build up (or down) layer-by-layer and cannot print in mid-air
2. Cantilevers will need support material or may be printed sideways or upside down
3. If there is a part of the model that “hangs down” it will need supports or will not print

4

MODELING SOFTWARE:

1. Rhino is recommended, Sketchup can work but needs work and careful attention ot surfaces
2. Revit is very much not recommended
3. AutoCAD 3D is also not recommended, but can work

5

MODEL CLEAN UP:

1. Surfaces need to be oriented correctly - to the “outside” of the model
2. Be mindful of and remove from the printing model, geometry that intersects other geometry
3. Consider removing very small geometry for small - scale buildings- door handles, mullions, etc.

3D PRINTING
FILE SETUP TIPS

1

TIME IS A FACTOR:

1. 3D Printing is not fast - it can take several to many hours for one print job.
2. Plan to spend a couple hours cleaning up your digital model before exporting
3. It might be faster to retrace the “exterior surfaces” (all the things you can see)
4. The digital model you may have made for the visual content, will likely not work well for 3d printing.

2

DON’T SWEAT THE SMALL STUFF:

1. It is supposed to be a model it shouldn’t show every possible detail.
2. If time is limited make sure the big parts are modeled correctly first the work down in detail level
3. Models should be “water tight”- if is not water tight it’s not solid and it won’t print well.

3

BE REALISTIC ABOUT REALISM:

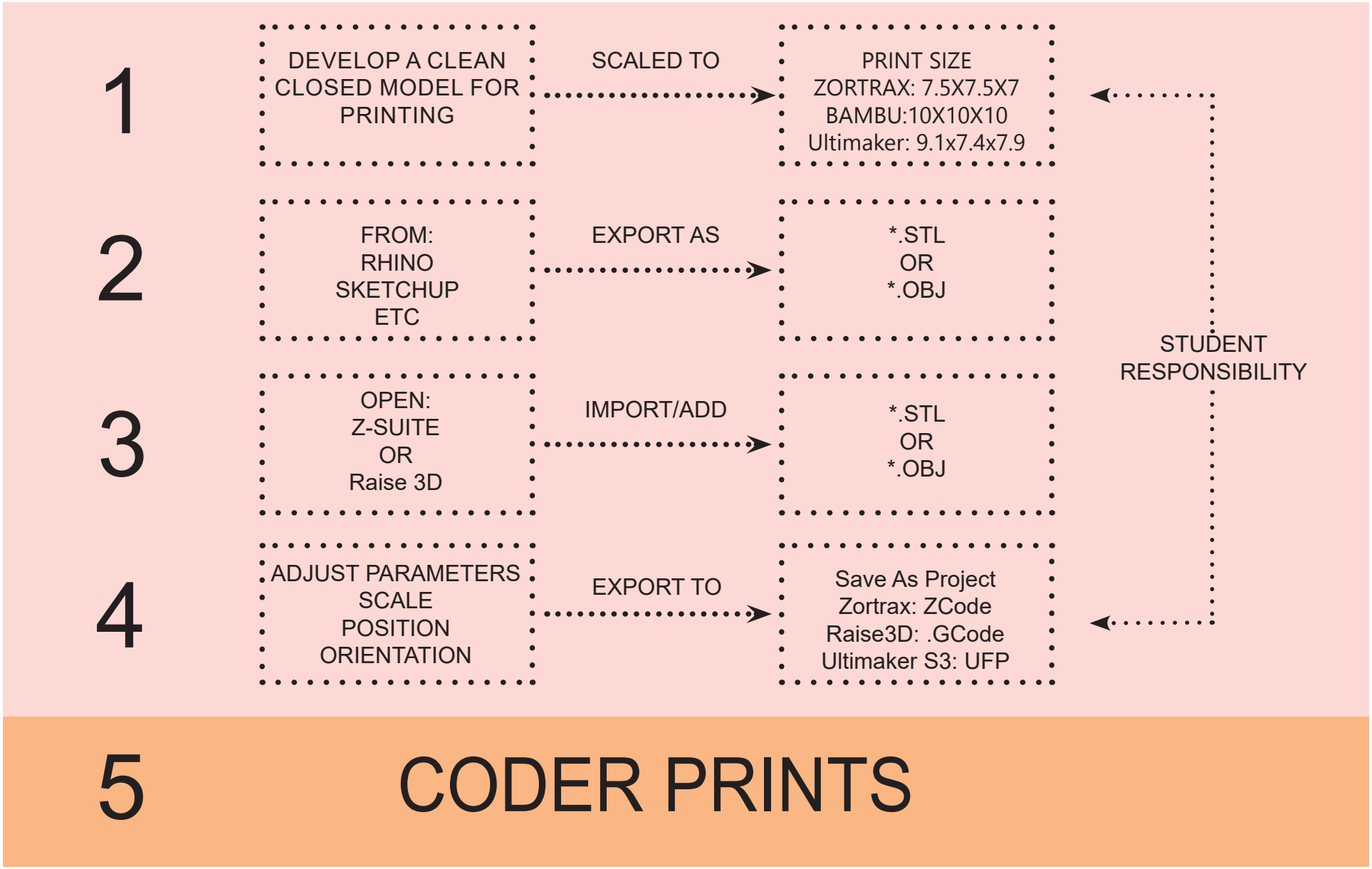
1. At 1/32” or even 1/16” it can’t print door handles panes of glass, etc.
2. Maybe don’t model each stair, model the idea of the stairs
3. If you want entourage in your model you should print it separately

4

THEY ARE ACCURATE, BUT NOT PRECISE:

1. Only use one printer for all parts of the same model - be sure to let us know!
2. If you are making interlocking pieces, test the fitment using small pieces first

3D PRINTING PROCESS



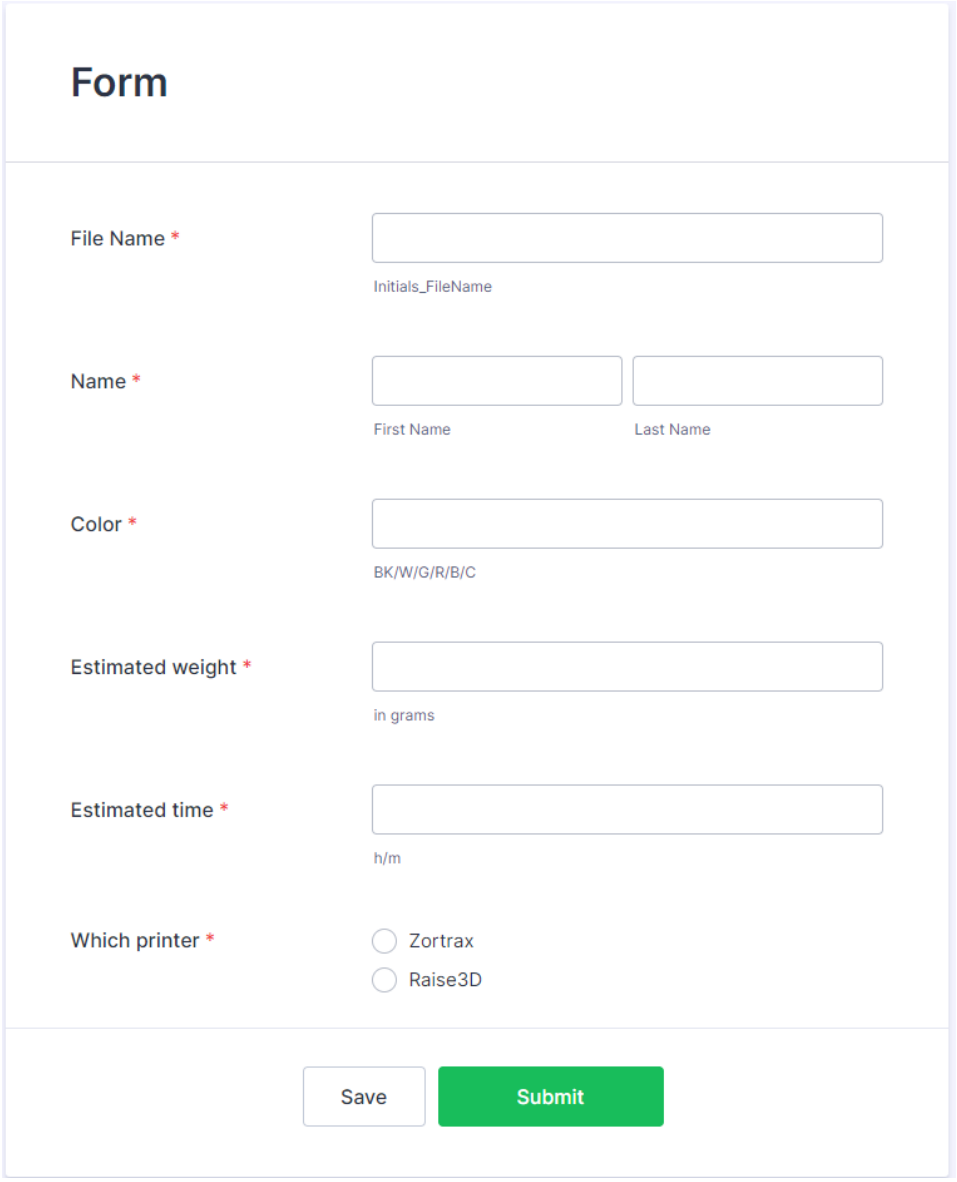
3D PRINTING
File Submission

To submit a 3D print after Coder has reviewed your file out the form.

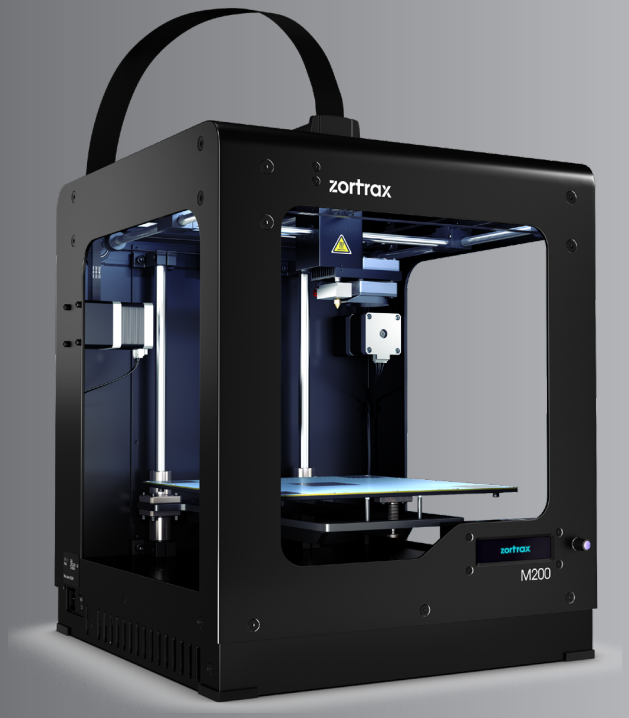
This will be used to track progress on your model

A person from Coder will review your g-code and project file and start the printing process.

https://www.jotform.com/212516084053044



3D PRINTING
ZORTRAX

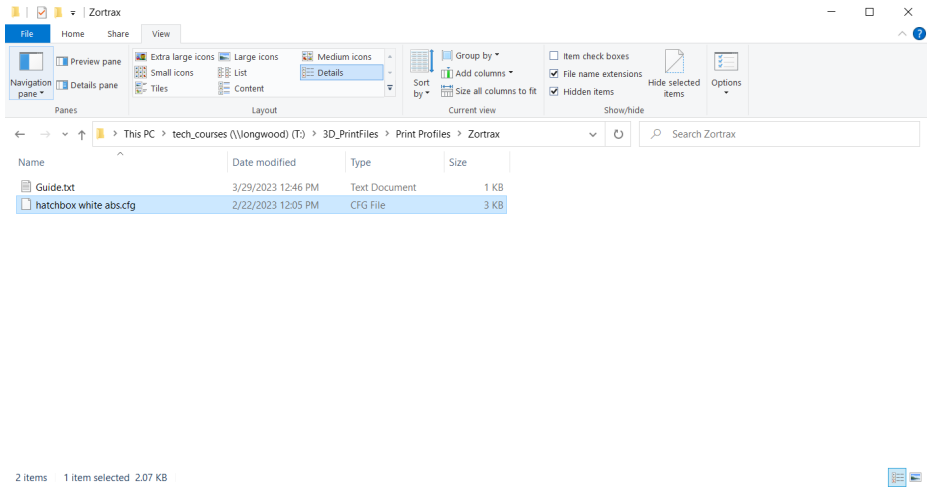


ZORTRAX
PRINT PROFILE SETUP

Before loading your model you need to load the print profile.

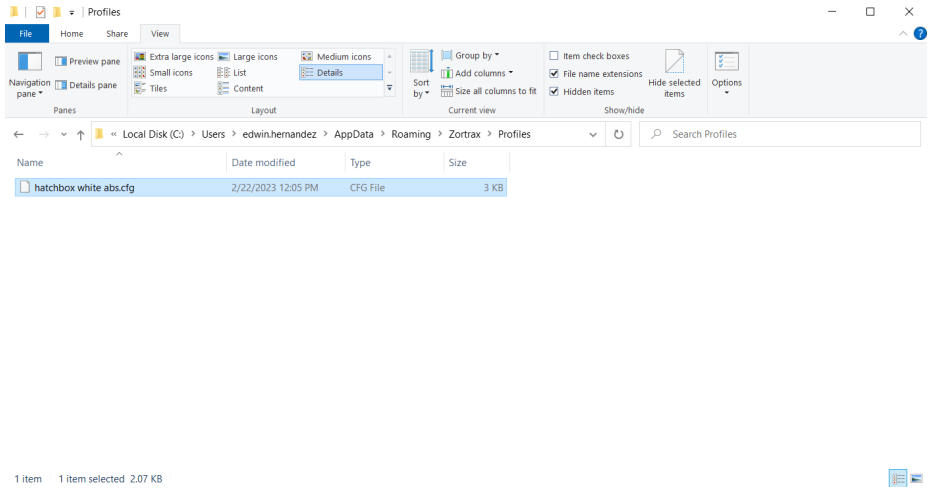
Navigate to
T:\3D_PrintFiles\Print Profiles\Zortrax

Copy hatchbox white abs.cfg

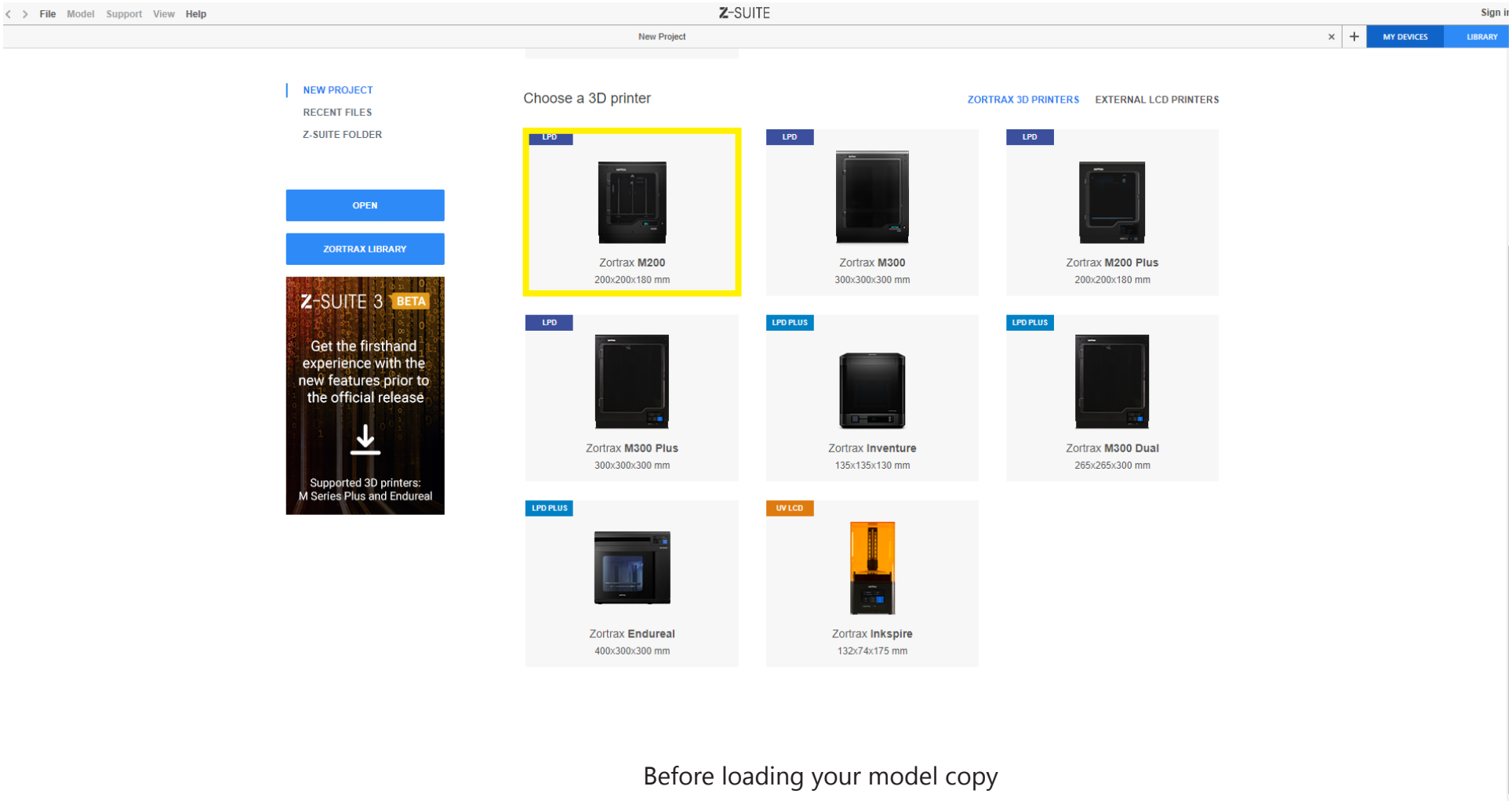


Hit “Window+R” on your keyboard and within the Run Dialog that pops up and type in %appdata%, scroll to the bottom and search for “Zortrax” the Profiles

Paste hatchbox white abs.cfg into the Profiles folder

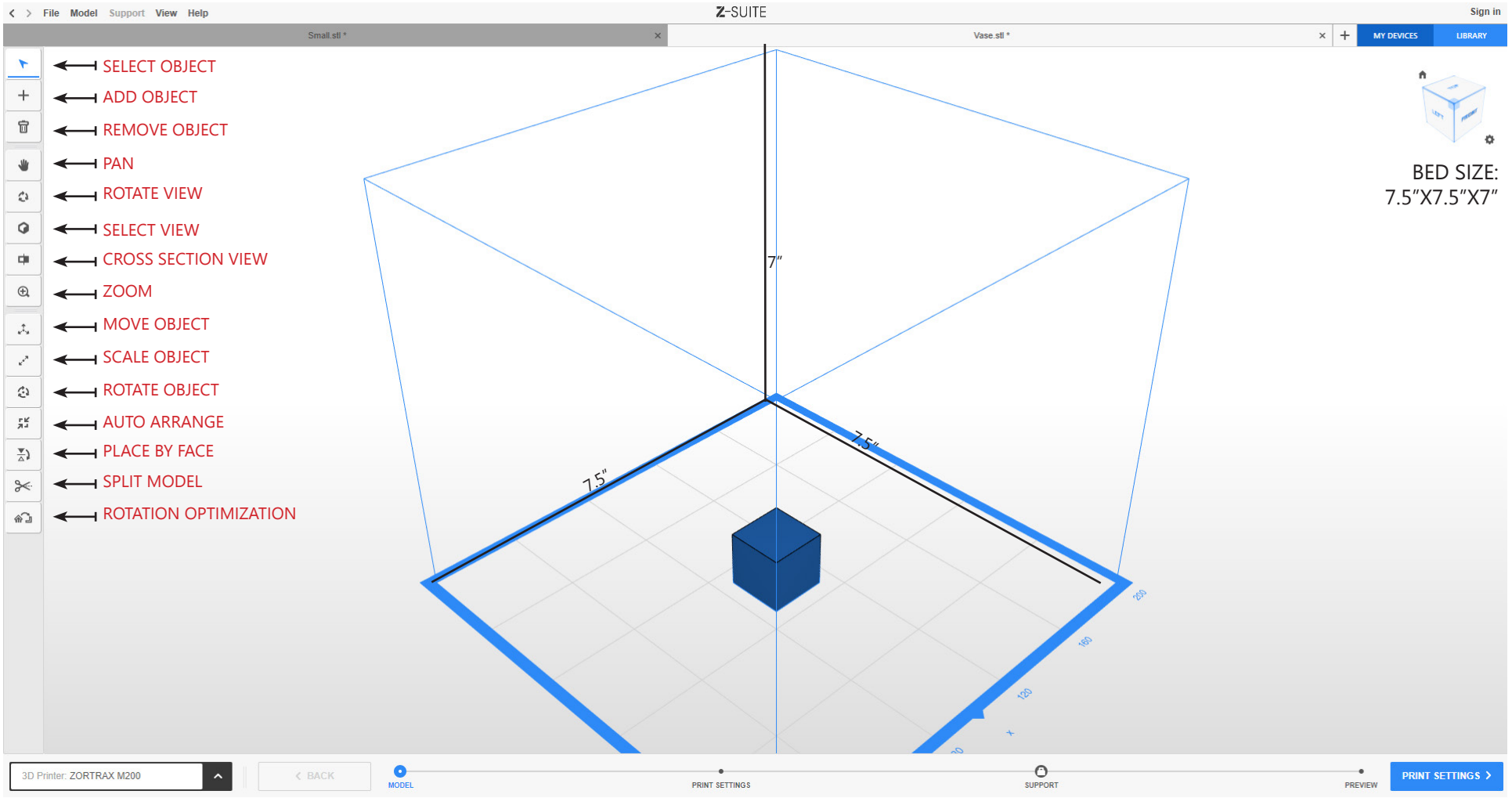


ZORTRAX M200

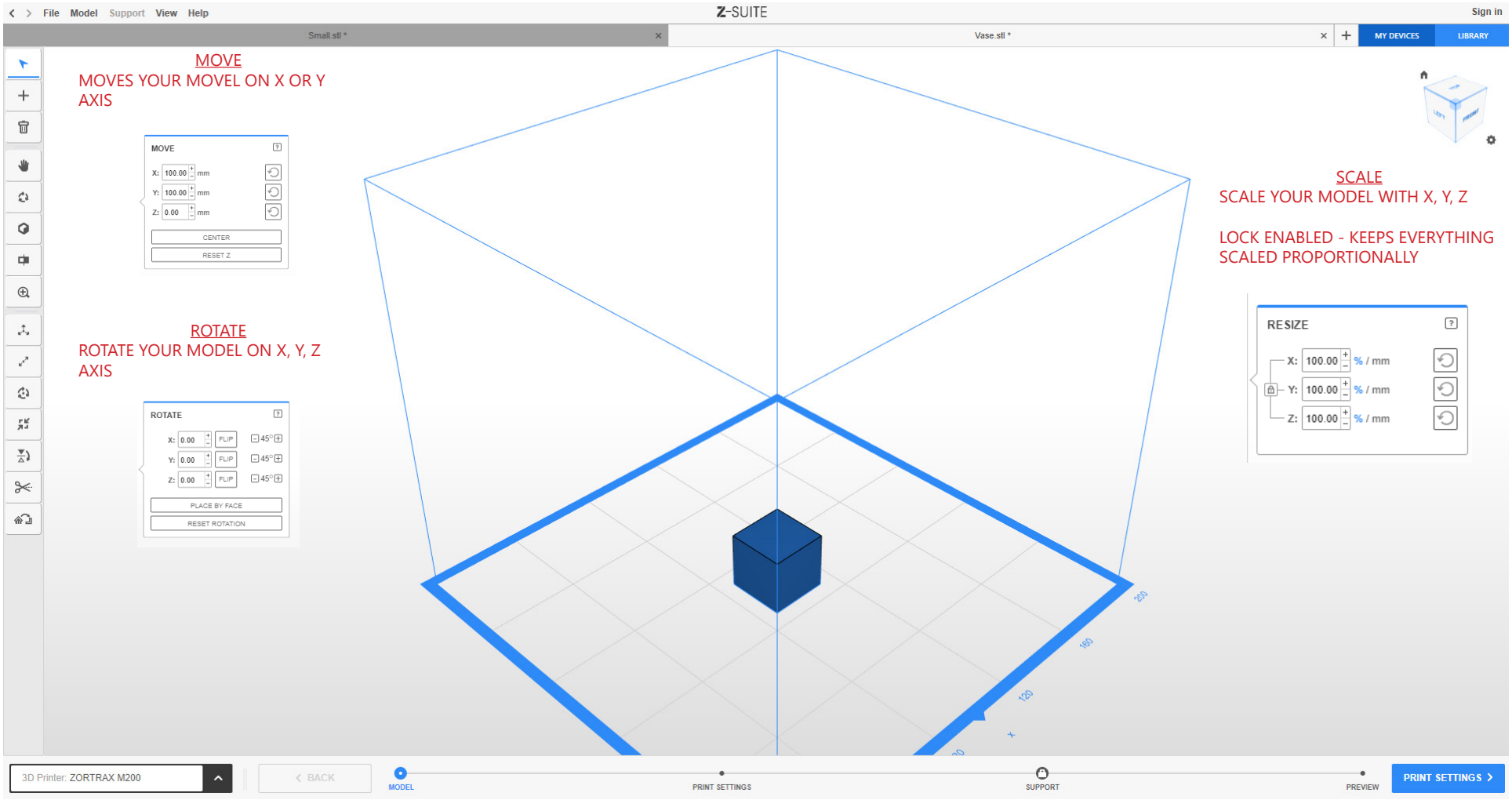


Before loading your model copy

ZORTRAX OVERVIEW



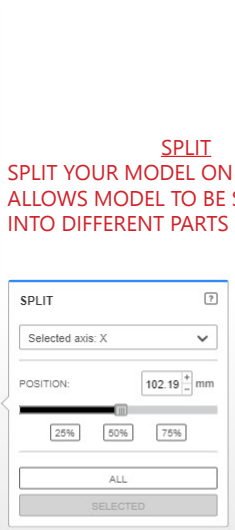
ZORTRAX
MOVE/ROTATE/SCALE



ZORTRAX
SPLIT

SPLIT

SPLIT YOUR MODEL ON X, Y, Z AXIS
ALLOWS MODEL TO BE SEPARATED
INTO DIFFERENT PARTS



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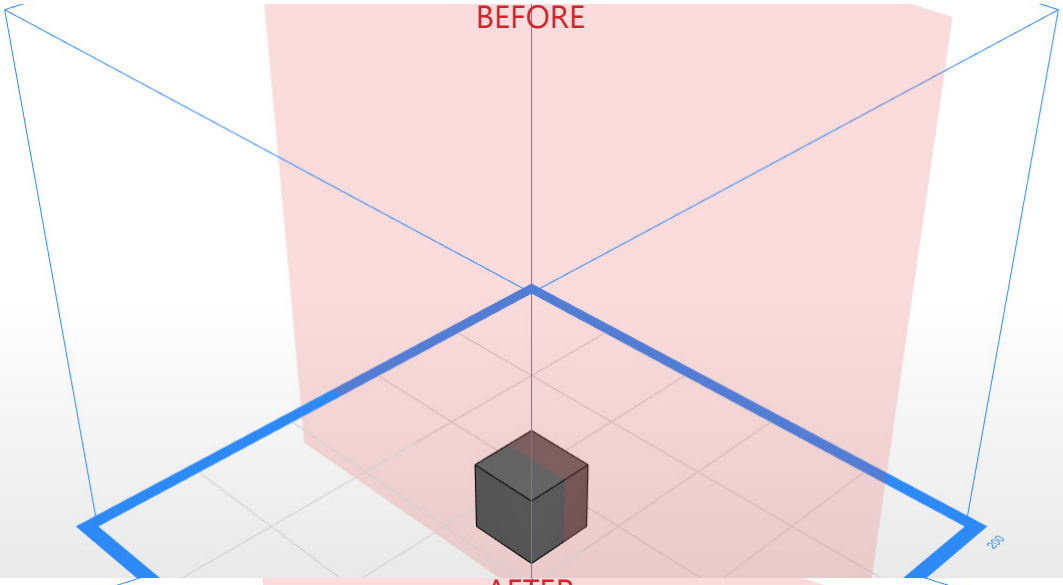

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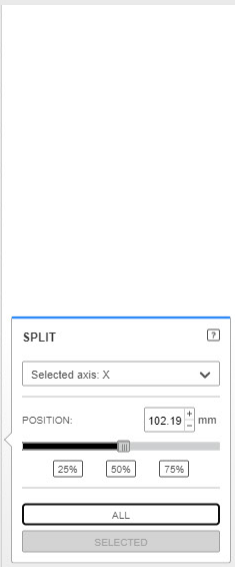
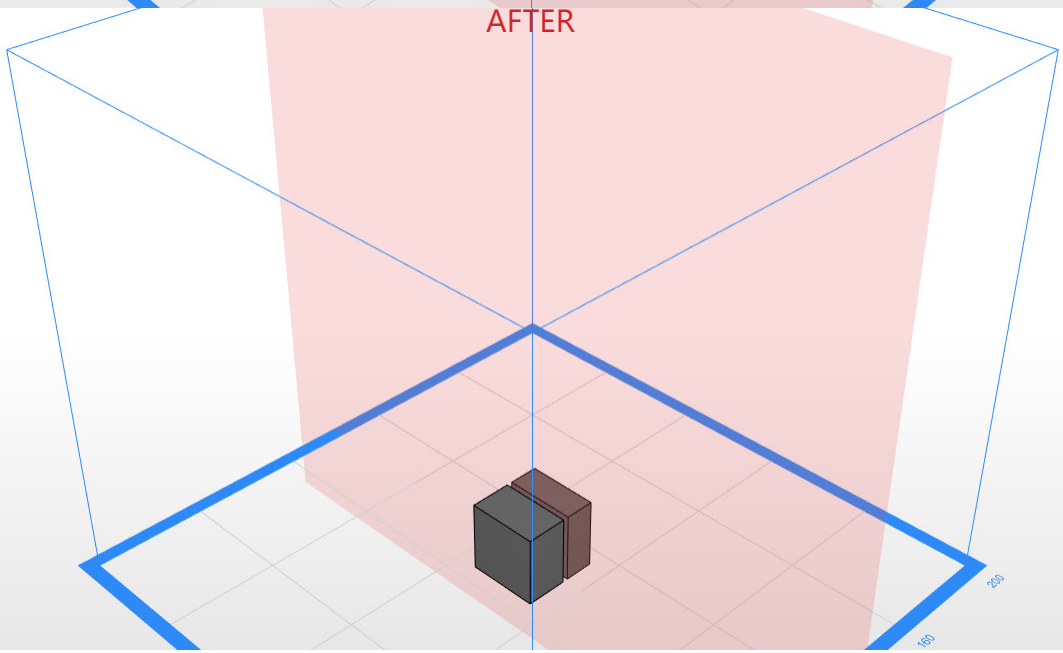
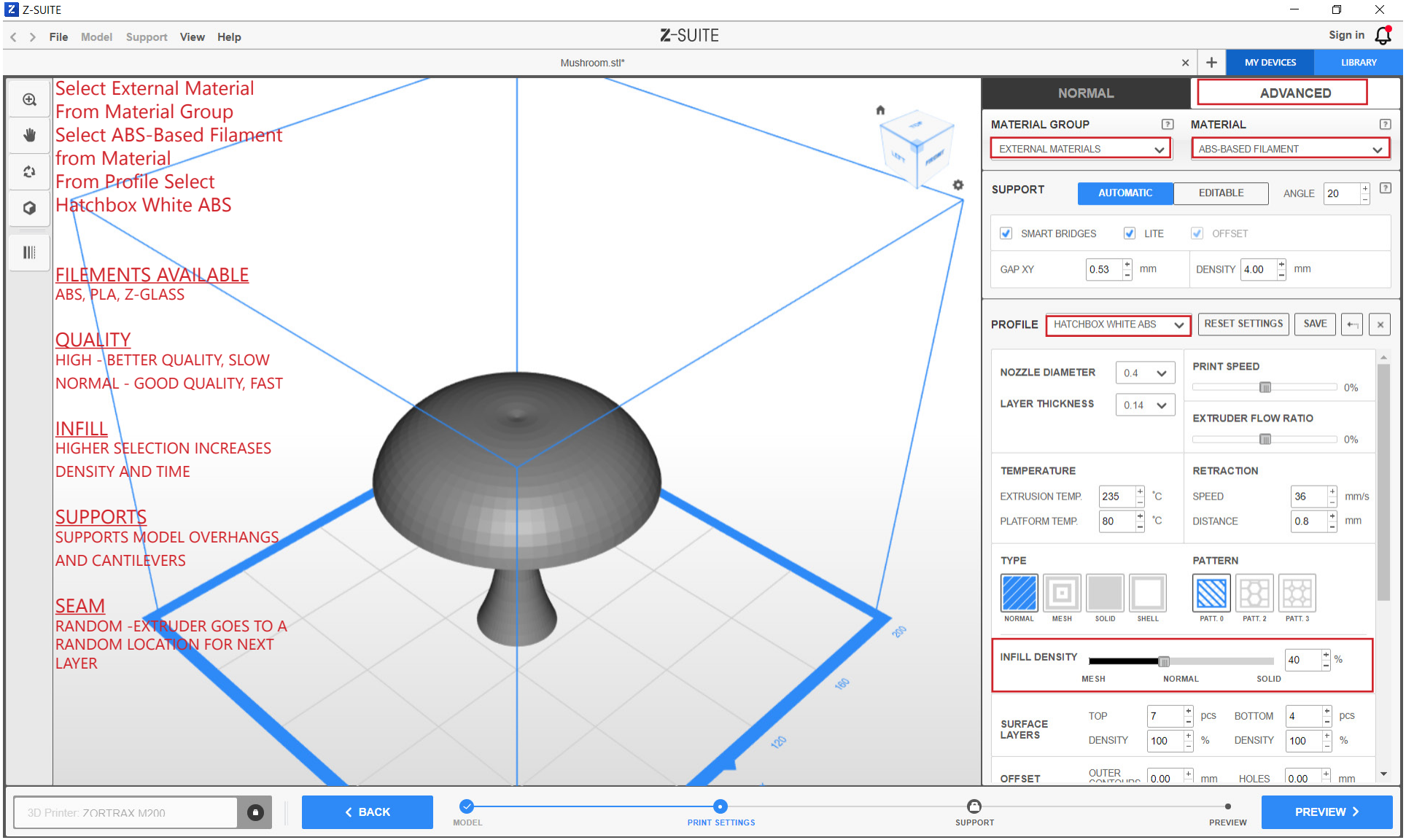
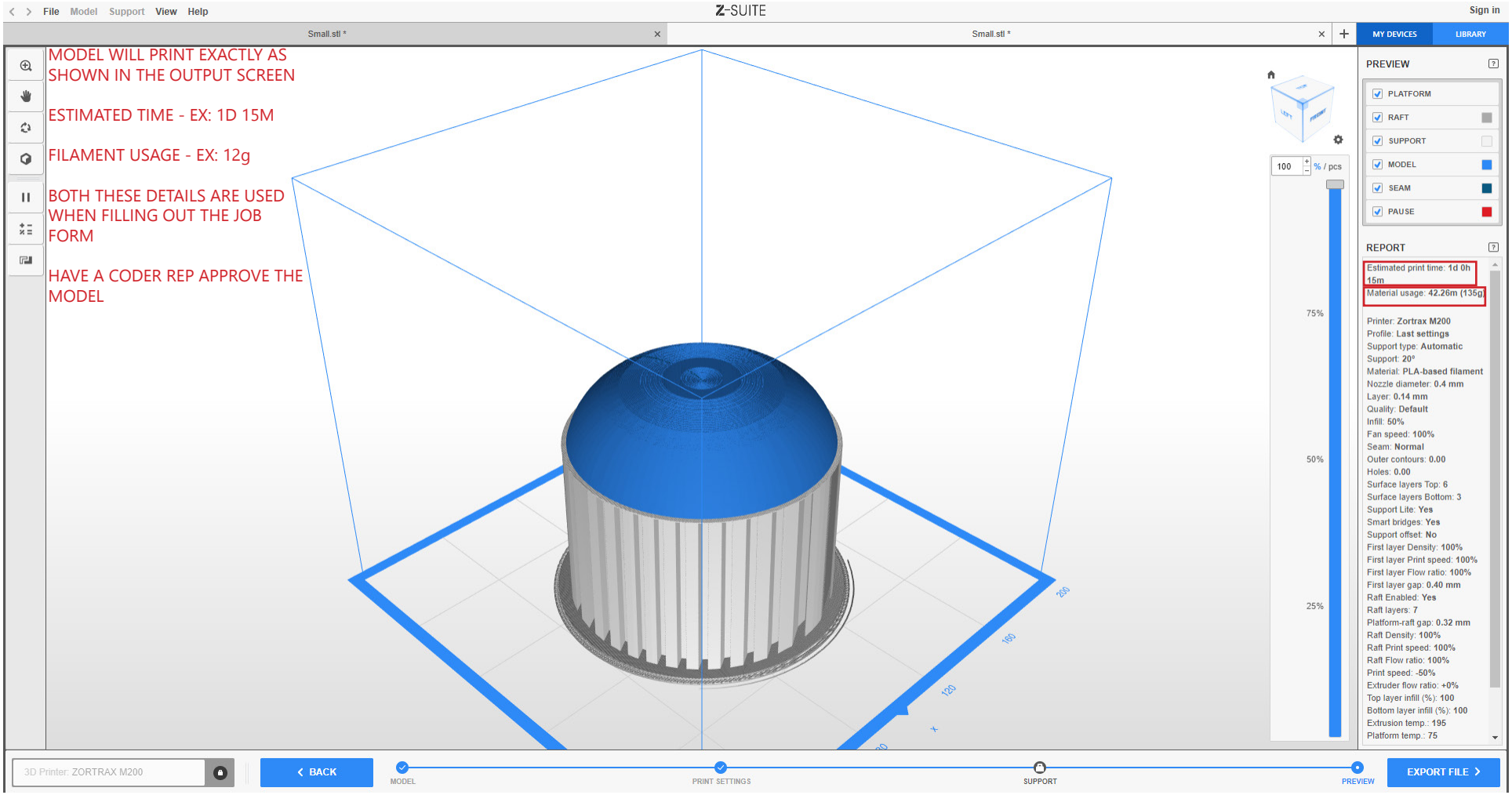




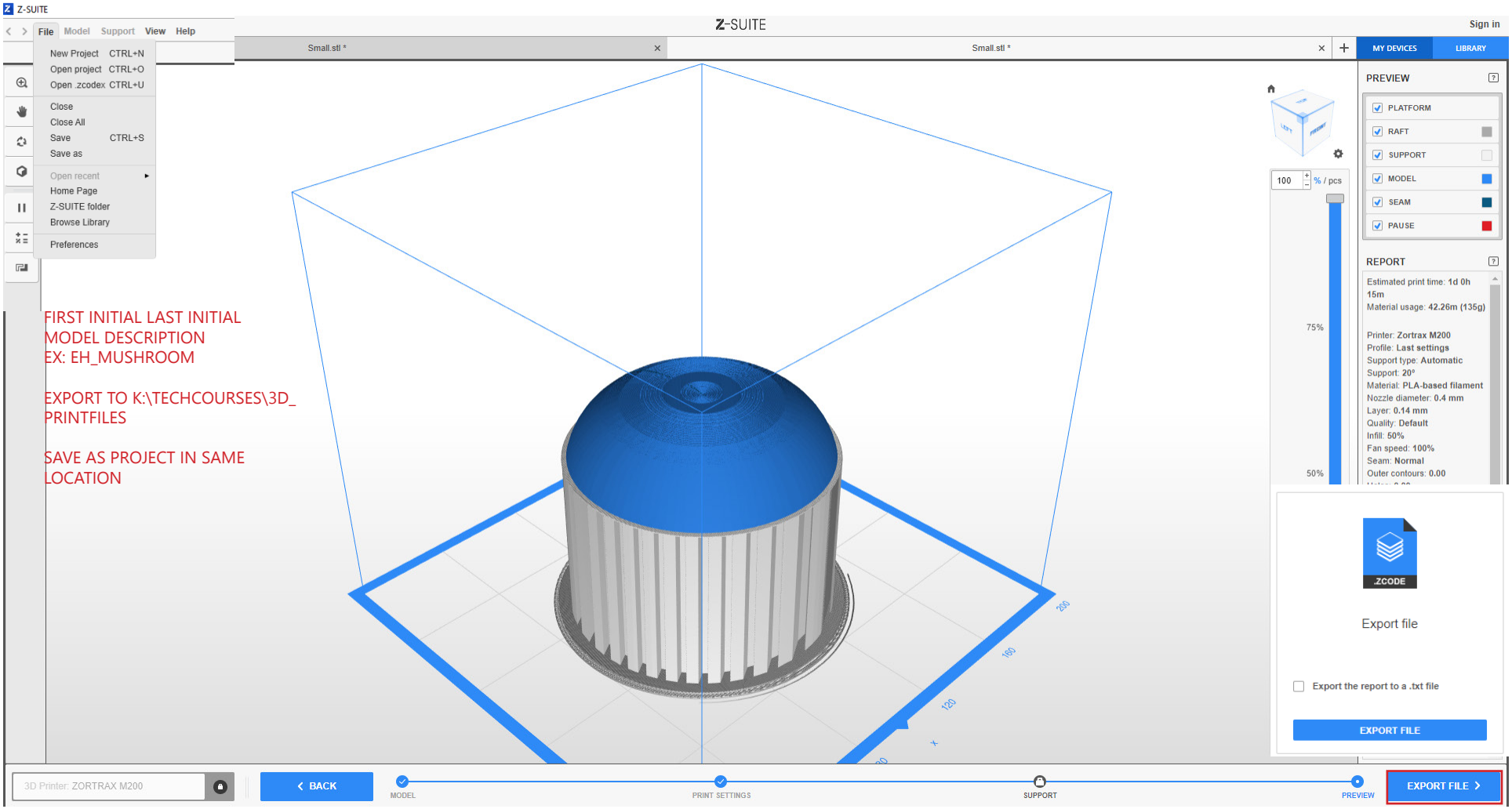
ZORTRAX
PREPARING PRINT FILE



ZORTRAX
PRINT OUTPUT



ZORTRAX
SAVING FILES



ZORTRAX
TROUBLESHOOTING YOUR PRINT JOB

- Objects Not Flat : Ensure that all your models on on the flattest part of your model. This will prevent the model from lifting and needing supports

- Scale down your model: Due to printing limitations we are unable to print at full scale. Scale down your model in your modeling program not in the slicing software

- Not finding your model in the slicer. Export your model again but this time ensure that it is located at 0,0,0 coordinates.

- Hatchbox profiles can be found in TechCourses:3D_PrintFiles\Print Profiles\Zortrax
  Copy hatchbox white abs.cfg to
  Hit "Ctrl+R" on your keyboard and within the Run Dialog that pops up and type in %appdata%, scroll to the bottom and search for "Zortrax" folder