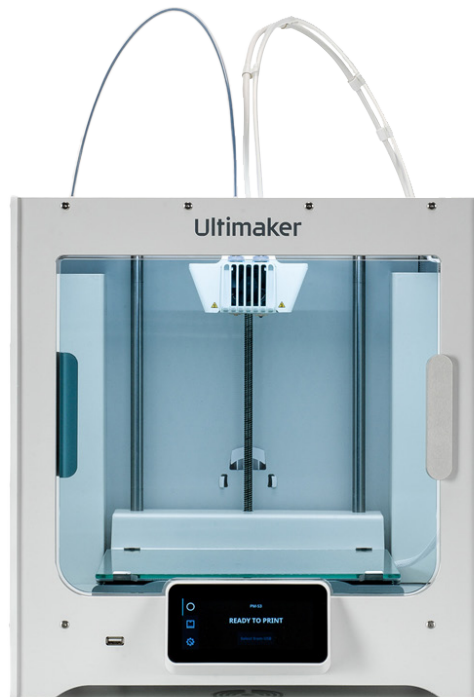
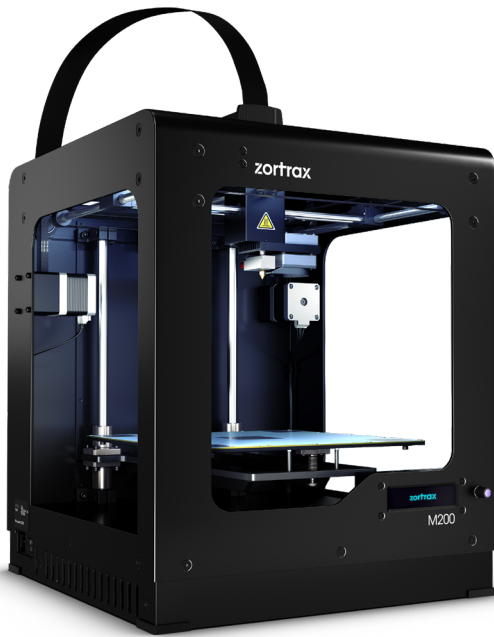


3D PRINTING AT THE BAC



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 of 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 then work down in detail level
3. Models should be “water tight” - if it 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

1

DEVELOP A CLEAN
CLOSED MODEL FOR
PRINTING

SCALED TO

PRINT SIZE
ZORTRAX: 7.5X7.5X7
BAMBU: 10X10X10
Ultimaker: 9.1x7.4x7.9

2

FROM:
RHINO
SKETCHUP
ETC

EXPORT AS

*.STL
OR
*.OBJ

3

OPEN:
Z-SUITE
OR
Raise 3D

IMPORT/ADD

*.STL
OR
*.OBJ

4

ADJUST PARAMETERS
SCALE
POSITION
ORIENTATION

EXPORT TO

Save As Project
Zortrax: ZCode
Raise3D: .GCode
Ultimaker S3: UFP

STUDENT
RESPONSIBILITY

5

CODER PRINTS

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>



Form

File Name *

Initials_FileName

Name *

First NameLast Name

Color *

BK/W/G/R/B/C

Estimated weight *

in grams

Estimated time *

h/m

Which printer *

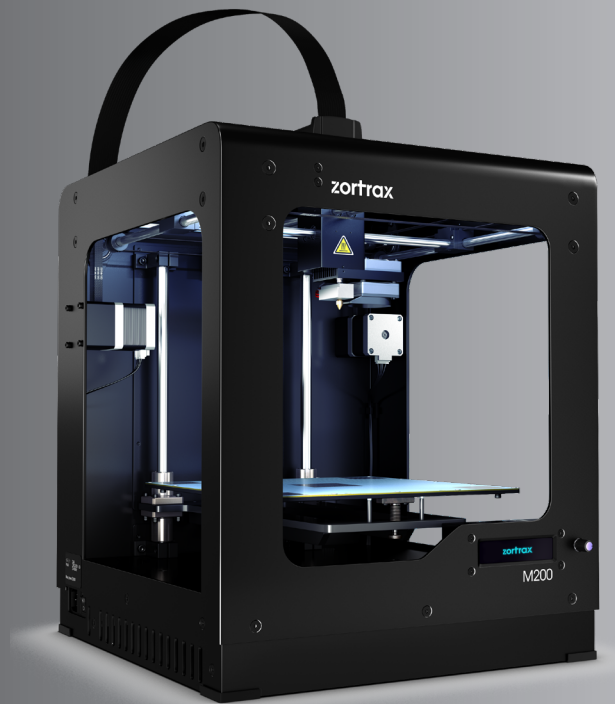
☐ Zortrax

☐ Raise3D

Save

Submit

3D PRINTING ZORTRAX

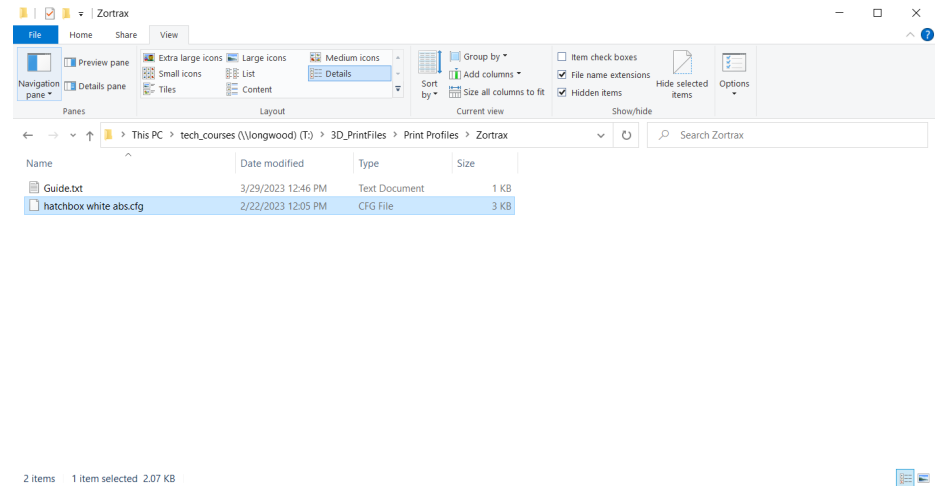


ZORTRAX PRINT PROFILE SETUP

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

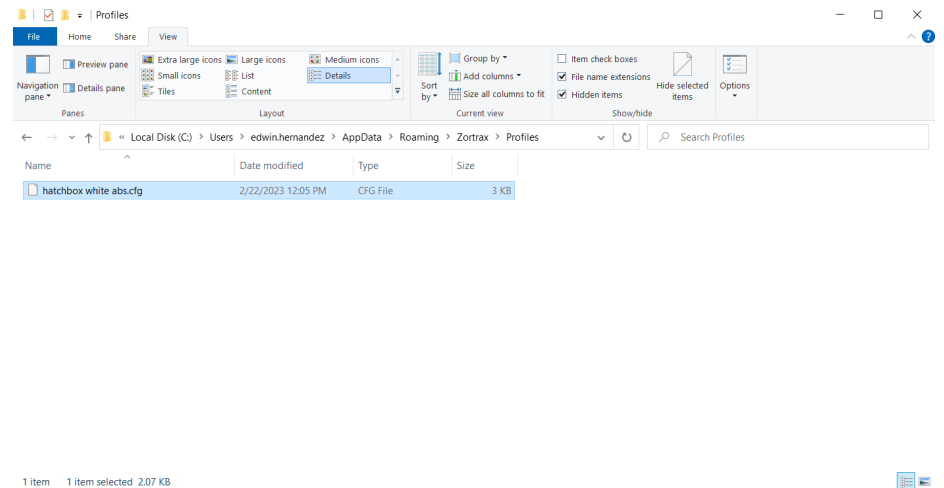
Navigate to
T:\3D_PrintFiles\Print Profiles\Zortrax

Copy hatchbox white abs.cfg

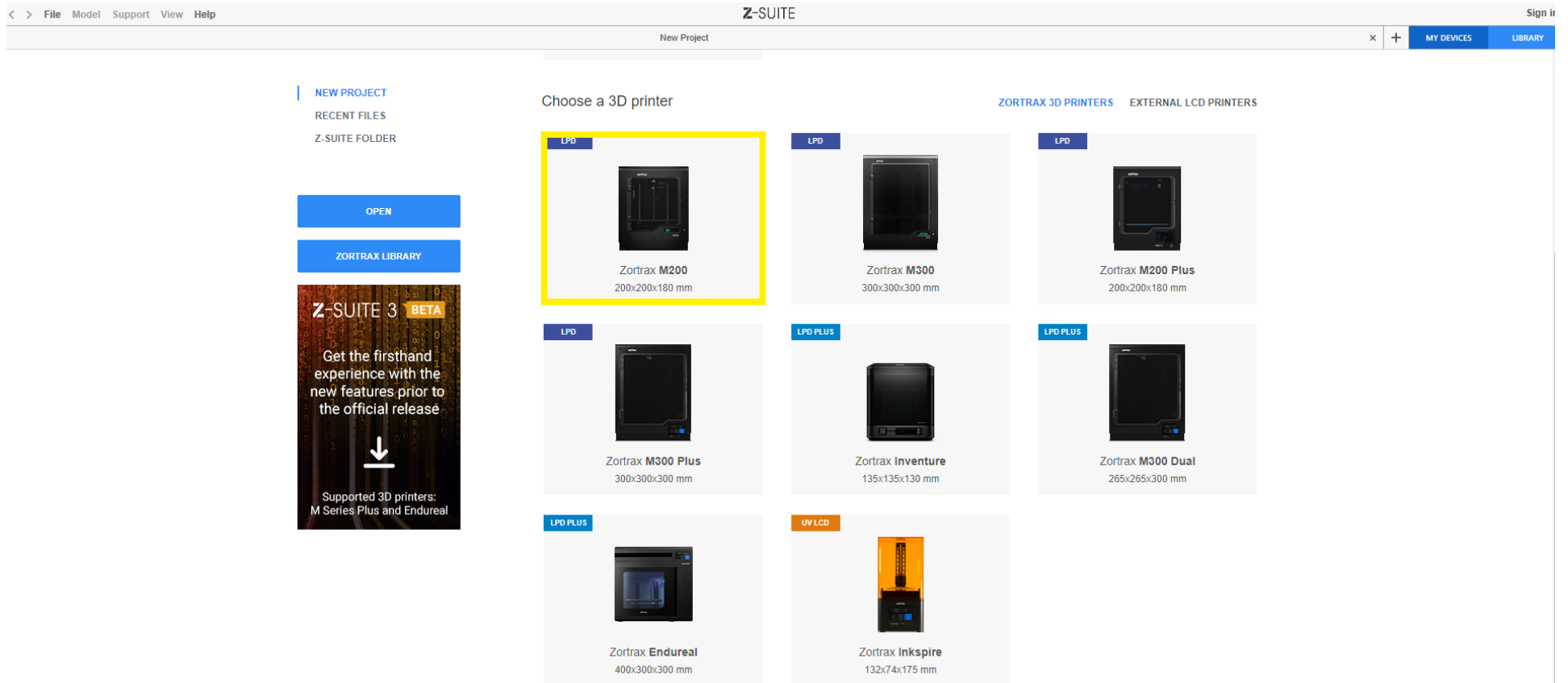


Hit “Window+R” on your keyboard and within the Run Dialog that pops up and type in %appdata%, scroll to the bottom and search for “Zortrax” the Profiles

Paste hatchbox white abs.cfg into the Profiles folder

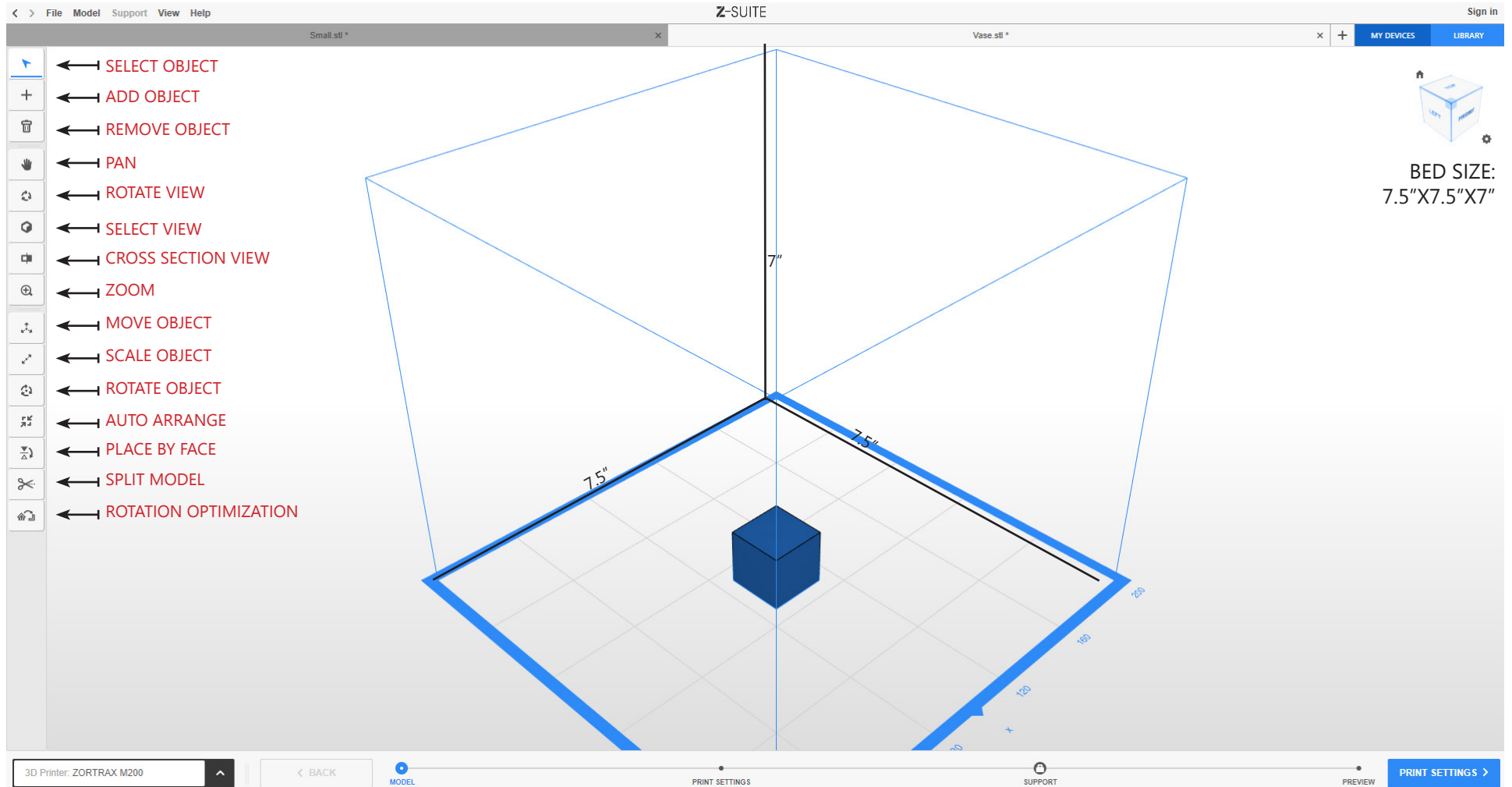


ZORTRAX M200



Before loading your model copy

ZORTRAX OVERVIEW



ZORTRAX

MOVE/ROTATE/SCALE

The screenshot displays the Z-Suite software interface with a 3D workspace containing a blue cube. The interface includes a top menu bar (File, Model, Support, View, Help), a toolbar on the left, and a bottom status bar. Three tool panels are highlighted with red text annotations:

- MOVE**
MOVES YOUR MODEL ON X OR Y AXIS
The MOVE panel shows input fields for X (100.00 mm), Y (100.00 mm), and Z (0.00 mm). It includes buttons for CENTER and RESET Z.
- ROTATE**
ROTATE YOUR MODEL ON X, Y, Z AXIS
The ROTATE panel shows input fields for X (0.00), Y (0.00), and Z (0.00) degrees, each with a FLIP button and a 45° preset. It includes buttons for PLACE BY FACE and RESET ROTATION.
- SCALE**
SCALE YOUR MODEL WITH X, Y, Z
LOCK ENABLED - KEEPS EVERYTHING SCALED PROPORTIONALLY
The RESIZE panel shows input fields for X (100.00 %), Y (100.00 %), and Z (100.00 %). It includes a LOCK icon and buttons for X, Y, and Z axis scaling.

The bottom status bar shows the 3D Printer (ZORTRAX M200), navigation buttons (BACK, MODEL, PRINT SETTINGS, SUPPORT, PREVIEW), and a PRINT SETTINGS button.

ZORTRAX SPLIT

SPLIT

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

SPLIT ?

Selected axis: X ▼

POSITION: mm

BEFORE

AFTER

ZORTRAX

PREPARING PRINT FILE

Z-SUITE

< > File Model Support View Help

Mushroom.stl*

Sign in

MY DEVICES LIBRARY

NORMAL **ADVANCED**

MATERIAL GROUP EXTERNAL MATERIALS **MATERIAL** ABS-BASED FILAMENT

SUPPORT AUTOMATIC EDITABLE ANGLE 20

☒ SMART BRIDGES ☒ LITE ☒ OFFSET

GAP XY 0.53 mm DENSITY 4.00 mm

PROFILE HATCHBOX WHITE ABS RESET SETTINGS SAVE

NOZZLE DIAMETER 0.4 **PRINT SPEED** 0%

LAYER THICKNESS 0.14 **EXTRUDER FLOW RATIO** 0%

TEMPERATURE EXTRUSION TEMP. 235 °C PLATFORM TEMP. 80 °C **RETRACTION** SPEED 36 mm/s DISTANCE 0.8 mm

TYPE NORMAL MESH SOLID SHELL **PATTERN** PATT. 0 PATT. 2 PATT. 3

INFILL DENSITY 40% MESH NORMAL SOLID

SURFACE LAYERS TOP 7 pcs BOTTOM 4 pcs DENSITY 100% DENSITY 100%

OFFSET OUTER 0.00 mm HOLES 0.00 mm

3D Printer: ZORTRAX M200

< BACK MODEL PRINT SETTINGS SUPPORT PREVIEW >

Select External Material From Material Group
Select ABS-Based Filament from Material
From Profile Select Hatchbox White ABS

FILEMENTS AVAILABLE
ABS, PLA, Z-GLASS

QUALITY
HIGH - BETTER QUALITY, SLOW
NORMAL - GOOD QUALITY, FAST

INFILL
HIGHER SELECTION INCREASES DENSITY AND TIME

SUPPORTS
SUPPORTS MODEL OVERHANGS AND CANTILEVERS

SEAM
RANDOM - EXTRUDER GOES TO A RANDOM LOCATION FOR NEXT LAYER

ZORTRAX PRINT OUTPUT

MODEL WILL PRINT EXACTLY AS SHOWN IN THE OUTPUT SCREEN

ESTIMATED TIME - EX: 1D 15M

FILAMENT USAGE - EX: 12g

BOTH THESE DETAILS ARE USED WHEN FILLING OUT THE JOB FORM

HAVE A CODER REP APPROVE THE MODEL

3D Printer: ZORTRAX M200

< BACK

MODEL

PRINT SETTINGS

SUPPORT

PREVIEW

EXPORT FILE >

PREVIEW

- ☒ PLATFORM
- ☒ RAFT
- ☒ SUPPORT
- ☒ MODEL
- ☒ SEAM
- ☒ PAUSE

REPORT

Estimated print time: 1d 0h 15m

Material usage: 42.26m (135g)

Printer: Zortrax M200
Profile: Last settings
Support type: Automatic
Support: 20°
Material: PLA-based filament
Nozzle diameter: 0.4 mm
Layer: 0.14 mm
Quality: Default
Infill: 50%
Fan speed: 100%
Seam: Normal
Outer contours: 0.00
Holes: 0.00
Surface layers Top: 6
Surface layers Bottom: 3
Support Life: Yes
Smart bridges: Yes
Support offset: No
First layer Density: 100%
First layer Print speed: 100%
First layer Flow ratio: 100%
First layer gap: 0.40 mm
Raft Enabled: Yes
Raft layers: 7
Platform-raft gap: 0.32 mm
Raft Density: 100%
Raft Print speed: 100%
Raft Flow ratio: 100%
Print speed: -50%
Extruder flow ratio: +0%
Top layer infill (%): 100
Bottom layer infill (%): 100
Extrusion temp.: 195
Platform temp.: 75

ZORTRAX SAVING FILES

File Model Support View Help

- New Project CTRL+N
- Open project CTRL+O
- Open .zcodex CTRL+U
- Close
- Close All
- Save CTRL+S
- Save as
- Open recent
- Home Page
- Z-Suite folder
- Browse Library
- Preferences

Small.stl * x

Small.stl * x +

MY DEVICES LIBRARY

PREVIEW

- ☒ PLATFORM
- ☒ RAFT
- ☒ SUPPORT
- ☒ MODEL
- ☒ SEAM
- ☒ PAUSE

REPORT

Estimated print time: 1d 0h 15m
Material usage: 42.26m (135g)

Printer: Zortrax M200
Profile: Last settings
Support type: Automatic
Support: 20°
Material: PLA-based filament
Nozzle diameter: 0.4 mm
Layer: 0.14 mm
Quality: Default
Infill: 50%
Fan speed: 100%
Seam: Normal
Outer contours: 0.00

Export file

☐ Export the report to a .txt file

EXPORT FILE

3D Printer: ZORTRAX M200

< BACK MODEL PRINT SETTINGS SUPPORT PREVIEW **EXPORT FILE >**

FIRST INITIAL LAST INITIAL
MODEL DESCRIPTION
EX: EH_MUSHROOM

EXPORT TO K:\TECHCOURSES\3D_
PRINTFILES

SAVE AS PROJECT IN SAME
LOCATION

ZORTRAX

TROUBLESHOOTING YOUR PRINT JOB

- Objects Not Flat : Ensure that all your models are 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