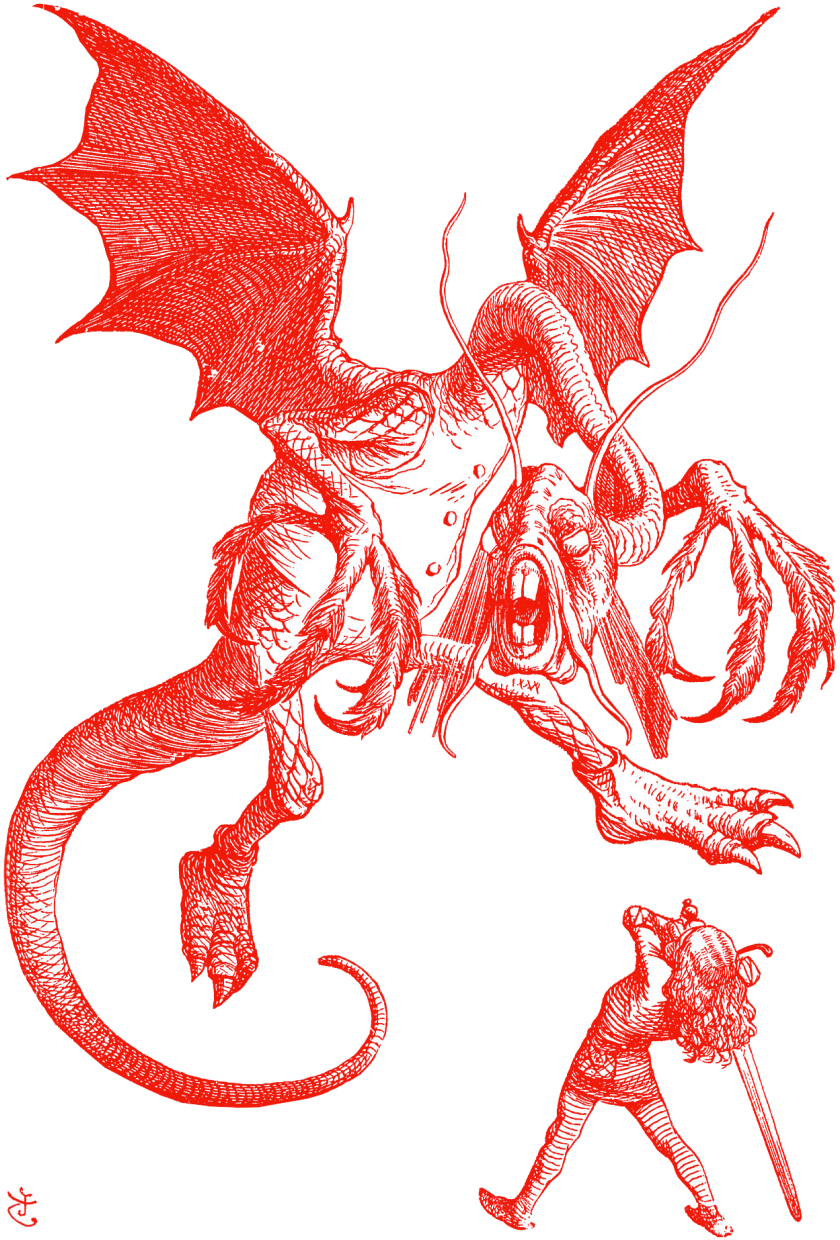

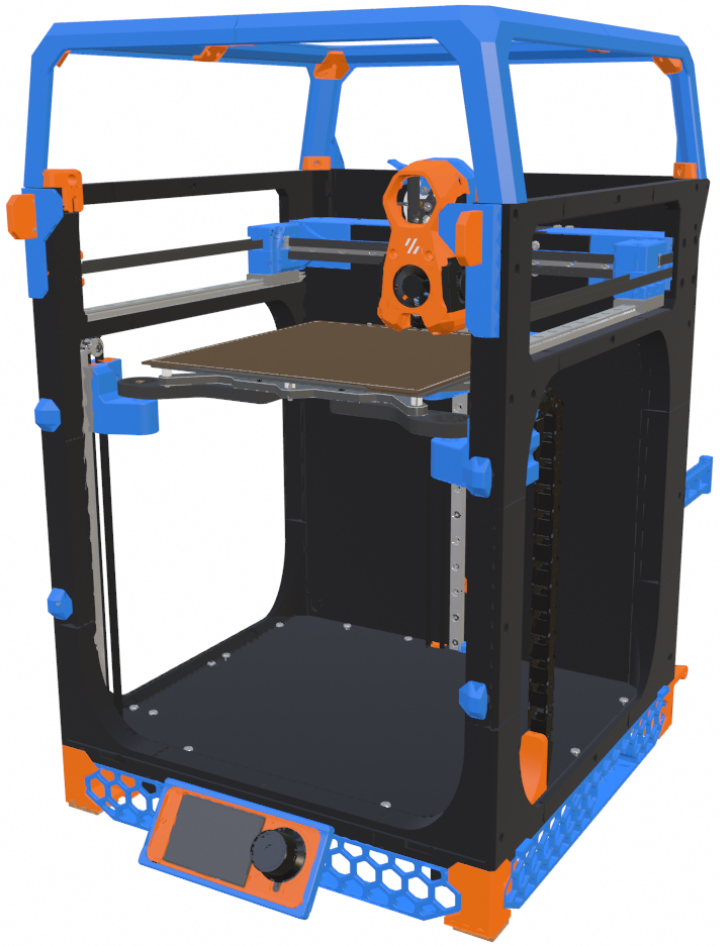

VORPAL 180 ASSEMBLY

Take up your sword and fight your dragons

VERSION 2023-11-05

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PREPARATION

PART PRINTING GUIDELINES

This printer was designed to utilize the Voron process as much as possible. Their material and print settings should be followed to ensure a mechanically sound machine.

3D PRINTING PROCESS

Fused Deposition Modeling (FDM)

MATERIAL

ABS

LAYER HEIGHT

Recommended: 0.2mm

EXTRUSION WIDTH

Recommended: Forced 0.4mm

WALL COUNT

Recommended: 4

SOLID TOP/BOTTOM LAYERS

Recommended: 5

INFILL TYPE

Grid, Gyroid, Honeycomb, Triangle or Cubic

INFILL TYPE: FRAME PIECES

Cubic

INFILL PERCENTAGE

Recommended: 40%

COLORS AND QUANTITIES

All .stl files with a suffix of "xN" need to be printed N times. Any .stl file without an "x2" style suffix is a unique part in the assembly of the printer.

The color naming convention is as follows:

[b]_xxxx.stl → Base Color
[p]_xxxx.slt → Primary Color
[a]_xxxx.stl → Accent Color

PREPARATION

PRINT CALIBRATION

The Calibration_square_100mm.stl is provided in the Tools folder to help verify the dimensional accuracy and squareness of the printer/material used to produce parts for the Vorpal 180. ABS has a rather high shrinkage ratio and this needs to be accounted for while printing. With the larger printed pieces of the Vorpal design, accuracy becomes more crucial.

By measuring the Calibration Square with calipers, you can determine the X and Y shrinkage factor for your printer/material. Measure the X and Y dimensions separately and use the equation below to find a value to put into your slicing software.

10000 / [measured] = ScalingFactor
example:
X → 10000 / 99.32mm = 100.68
Y → 10000 / 99.48mm = 100.52

You can use each of these values separately or take the average and use that for both X and Y. The Z axis shrinkage is not usually an issue and should be left at 100.0. In your slicer I suggest manually setting the X/Y scale factors for every printed part. This cannot be applied to the released files because each printer and material will have unique values. This process is different and more accurate than the XY Size Compensation setting found in some slicers but will not address issues such as holes being undersized or part thickness accuracy due to over/under extrusion.

Using different brands of ABS or using a mix of ABS and ASA parts might require separate calibrations per material/printer.

Another feature of the Calibration Square is the inclusion of 3mm holes with 20mm spacing. When calibrated well, each row of holes should line up with the holes of an MGN9 rail and allow a full row of M3 screws to be installed with no binding. The Z_axis_rear_stiffener_x2.stl in the Electronics Bay folder is a good part for verifying the scale factor due to its length and its hole pattern that should also align with an MGN9 linear rail.

The Calibration Square can also be used to verify the squareness of the printer being used to generate parts. Using a pair of heat-set inserts and M3x20 BHCS, it can be assembled with its Base in order to follow the method described in the video linked below. Keep in mind that the measured error is double the actual mm out-of-square per 100mm of the printers' gantry.

https://youtu.be/hvVK2lOirBM?t=185

If the lines diverge from the bottom to the top then the right side of the gantry needs to be brought forward. If the lines converge from the bottom to the top then the left side needs to be adjusted towards the front of the printer.