

3D Printing Tips for Hapkit 2014

version: 10.08.14

General 3D Printing Tips

Make sure your build plate is level and calibrated:

- Instructions will vary depending on the brand and model of the printer being used. (We used a Makerbot Replicator 2.)
- An uneven build plate will cause deformation in your print.

Make sure that the filament is adhering securely to the build plate while printing:

- PLA – Use blue painter’s tape on the surface of the build plate to help the filament stick. Printing with a raft will help create a level surface before the actual part beings printing.
- ABS – If possible, use a heated build plate. Kapton tape works similar to blue tape for PLA. A thin slurry of ABS on the build plate may be necessary to act as a glue between the print and the plate.

Keep your printer away from windows, air conditioners, or other sources that may cause a draft. A draft can cause uneven heating in the filament, which in turn causes warping in the parts being printed.

Be careful while removing the printed part from the build plate to prevent damage to your printer and your part. A flat head screwdriver or painter’s spatula may be helpful in removing the part from the build plate.

Tips for Printing a Hapkit

If possible, avoid printing with support material. The tolerance of the CAD models may be altered by support material, which would cause them to not fit together properly.

It is essential the sector pulley be printed in a well-controlled environment.

- Make sure the temperature is consistent around the printer; avoid drafts or jarring of the printer.
- If the sector pulley does not stay in contact with the friction drive at all times it is likely that the part did not print correctly and may have experienced warping.

Make sure the 3D printer you propose to use can sufficient workspace to print the largest piece (the Base).

It is recommended that the parts of the Hapkit be printed in the suggested orientation. The orientation that is laid out will ensure that the screw holes remain round and in proper location.

Hapkit Parts and Orientation

When uploading these files to the 3D printing software of your choice, make sure to orient each part as described below to ensure proper printing.

Base.STL

- This is the base of the Hapkit and the largest individual part.
- Rotate part 90° about the x-axis → the part should now be sitting straight up with the word “hapkit” being readable



Drive_Wheel.STL

- This part consists of the friction drive with the magnet holder at the end.
- Rotate part 270° about the x-axis → the magnet holder should now be face down on the build platform with the skinny cylinder of the friction drive pointing straight up.



Sector Pulley.STL

- This is the sector pulley, whose arc must be nearly perfectly circular for an effective friction drive. Some of the sector pulleys we printed on our Makerbot Replicator 2 were not sufficiently circular, and they had to be re-printed or replaced with a laser-cut sector pulley.
- Rotate part 90° about the x-axis → the pulley should now be lying flat on the build surface with the hemisphere on the handle facing up



Height_Bar.STL

- This is the height adjustment bar, which allows the user to adjust the height of the sector pulley with respect to the motor pulley.
- No adjustment needs to be made → the part should be lying flat with the three holes facing up.

