3D printing

- Gridfinity but with minimal plastic use and printing time

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Gridfinity is great, but it's pretty wasteful of plastic, especially if you use the original bin and baseplate designs by Zack Freedman. There's many alternative designs available by now, but it's hard to find what you need, and I've been spending some time figuring out exactly *how* low I can get the plastic use and printing time of my Gridfinity setup, **without compromising on functionality**.

These are my findings. I'll update them as I discover new things.

General notes

Use a strong PLA+. The good ones are much stronger than typical PLA, and you'll be able to get away with 2-layer perimeter walls (0.8mm) without any meaningful loss of robustness. I've been using GST3D but their quality control is unreliable, so if you get a good batch then it's *good* but if you get a bad batch, well, good luck.

You probably need 3-layer perimeter walls if you're using a standard PLA or weak PLA+, and the ultralight designs may not work for you. But give it a shot first!

Baseplates

The standard design has magnet holes and thick edges. Great if you need the strength, or you need to insert magnets (or screw them down!), but not so great if you really just need some basic grids to glue or tape onto a surface, for example.

I've been primarily using these baseplates: https://printables.com/model/596506-gridfinity-superlight-baseplates

However, I've recently discovered that you can just delete the top 1mm of the 'spec-compliant' baseplate and *it will still work fine*. This is a big deal, because this saves **a quarter of the filament** and on my 1 hour and 43 minute print, it cuts 20 minutes of print time off it. I don't know if it's technically spec-compliant.

The bins

There are a lot of problems with the standard Gridfinity bins. The magnet holes are the obvious one, and the wall thickness could be a lot less, but did you know that the 'feet' can be hollowed out? And that the standard scoop radius is *way* too big, and you can reduce it significantly, using way less plastic *and* making it easier to remove parts from a bin?

I've been using this OpenSCAD generator to generate ultralight bins:

https://makerworld.com/en/models/513771-gridfinity-ultra-light-bin-generator (if you don't have an account, you can also grab it from here: UltraLightGridfinityBins.scad - it's licensed under CC BY-NC-SA).

There's also pregenerated STLs for those ultralight bins at

https://www.printables.com/model/627719-gridfinity-ultra-light-bins-plain-edition, but crucially, **those don't have a finger scoop** and it's not documented anywhere that scoops are even supported by the underlying generator! So I really strongly recommend using the generator directly in OpenSCAD. I've found a scoop radius of 12 to be really convenient, and not add *that* much plastic to the print, all things considered. This is different from the default of 15.

You can use the ultralight base with the scoop, it works fine. It doesn't *look* nice, necessarily, but I've not found it to impair the functionality of the bin at all.

If you're wondering whether this is all really worth it: in my testing, I found a reduction from 40 grams of plastic to 26.5 grams for a 1x2 three-compartment scoop bin, and the lighter one works better!

Custom bin designs

If you're making custom bins in OnShape, you may have been using this OnShape project as a reference. It's not exposed in the configuration settings on the left, but if you go to the variable table in the tiny menu on the right edge, you'll find a `WALL_THICKNESS` variable that you can set to 0.8 (or whatever else constitutes two walls with your slicer settings).

Under Parts -> Unit -> Start, you can delete all of the hole extrusions and chamfer, and this will make the magnet holes go away. There doesn't seem to be an option for hollow feet, though.