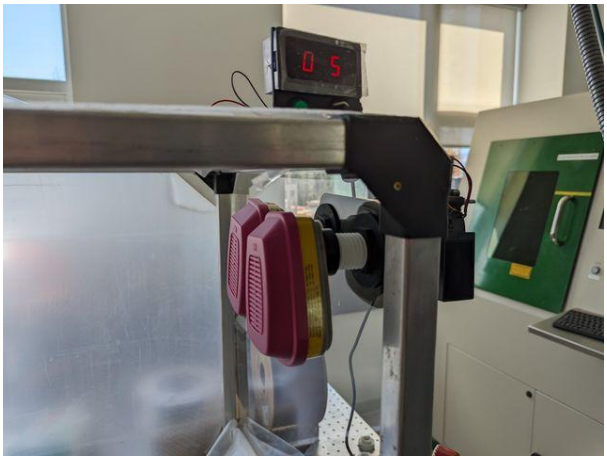


Enclosure Filter (3M Filters)

Ian Foulds

VIEW IN BROWSER

updated 28. 8. 2023 | published 1. 8. 2023

Summary

A simple through-wall filter adapter that allows you to pull your enclosure air through high efficiency bayonet filters.

4.83 hrs	1 pcs	0.20 mm	0.40 mm	PLA	137 g	Prusa MK4

3D Printers > 3D Printers - Upgrades

Tags: filter enclosure filterholder filteradapter 3m60923

This is a simple filter system for enclosures. (I don't have a Prusa enclosure to perfectly adapt it to the existing filter pass-through.) It allows you to pull your enclosure air through standard 3M bayonet filters (like on a painting mask) using a squirrel cage fan. I of course make no guarantee as to the system creating a safe breathing environment. That being said, health and safety at my work checked particle counts in my office while I was printing and there was no elevation in particulate levels. I also use filters for organic vapours 3M 60923 and when I print ABS or ASA I can't smell anything in my office unless I open the enclosure door. One nice thing about the system is that uses parts you can easily replace.

I have posted two versions, a 2 filter or a 4 filter manifold. 2 filter should be fine unless you really need to pull a lot of air. You need to print 1 fan

adapter, 1 manifold, and the corresponding number of threaded tubes, washer nuts and bayonets.

If you have any trouble with tolerances I would suggest scaling the X and Y directions for the threaded tubes to say 97% but leave the Z direction at 100%. That way the thread pitch doesn't change but the fit will be looser. A useful trick for 3d printed items with threads. They are threaded all the way down so if you want them shorter you can always just chop them down to size using Prusa Slicer (Cut command).

It is designed to be printed with no supports, but the bayonets may need some. I have been successful both ways.

The bayonets have a slot for 1/8" gasket, which I had lying around but you could always replace it with some closed cell foam, print some TPU gaskets or use fun-tak to seal it.

Should you wish to design your own bayonets for different filter brand. The threading is M30x3.5.

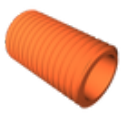
Should you wish to design your own fan adapter the manifold opening is 65 mm. Make sure you use a squirrel cage fan (blower) though as you need it be able to generate enough pressure to pull the air through the filters and normal case fans move lots of air but not if there is a back pressure.

I am using a San AceB97 9BMB24G201 fan which I bought through digikey. Though it is overkill and I am usually only running it at about 15%.

Model files

fan-adapter.stl

2_filter_manifold.stl



threaded_tube.stl

washer_nut.stl

filter_bayonet.stl

4_filter_manifold.stl

Print files

enclosure_filter_parts_04n_02mm_pla_mk4is_4h50m.gcode

PLA 0.40 mm 0.20 mm 4.83 hrs 137 g Prusa MK4

License

This work is licensed under a
Creative Commons (4.0 International License)

Attribution-NonCommercial

✖ | Sharing without ATTRIBUTION
✔ | Remix Culture allowed
✖ | Commercial Use
✖ | Free Cultural Works
✖ | Meets Open Definition