



Air Purifier with 140mm Fan



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[VIEW IN BROWSER](#)

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Summary

Air purifier to be mounted on an enclosure. It uses a combination of an activated charcoal mat and a HEPA filter.



11.83 hrs



2 pcs



0.20 mm



0.40 mm



PLA



132 g



Prusa
MK3/S/S+

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Tags: [air](#) [hepa](#) [hepafilter](#) [activatedcarbon](#) [airpurifier](#)
[charcoal](#)

I have designed this air purifier for my network cabinet turned printer enclosure. It uses an activated charcoal mat and a HEPA filter to remove any unwanted organic compounds and ultra fine particles from the printing process.

It is important to use a pressure optimized fan, otherwise the airflow will be too small.

Printing instructions

Use a filament that fits your purpose. If you have a heated enclosure don't use PLA. Layer height does not matter, use 0.2mm if you want to print to be pretty or 0.3mm for a shorter print time. 15-20% infill, Gyroid or Aligned Rectilinear both work well.

Assembly instructions

Screw the filter holder to the fan, look out for the airflow direction that should be marked on the side of the fan. Insert the filter mat holder into the lower step.

Take one filter mat and slice one side so that it has a size of 130mm x 100mm. It is better to leave it 2-3mm larger so that it will be nice and snug in the filter holder.

Add the charcoal mat on top of the mat holder, make sure that there are no gaps so that the air has to go through the mat. Now add the HEPA filter on top. It should fit right in and go in with a slight resistance.

Now mount the assembly on top or to the side of your housing. If you have not drilled any holes into the housing, the spacing of a 140mm fan is 125mm horizontally and vertically. If there are already holes for a 120mm fan use [an adapter](#).

Connect the fan to the fan hub and plug in the power supply. If you have it use some electrical tape to insulate the fan hub, especially if you have pets. Alternatively print a little box to hold the hub (coming soon, work in progress).

Lastly use the paper test to see if you have sufficient airflow through the filters.

Additional parts

- 140mm pressure optimized fan. [Arctic P14](#) or [Noctua NF-P14s Redux](#) or [Scythe Kaze Flex](#). If noise is of no concern use a [Noctua industrial NF-A14 PPC-2000](#), loud but offers the best result.
- [140mmx100mm HEPA filter for laser printers](#). The filter is rated for 12 months of continuous use.
- [130mmx130mm activated charcoal mat](#). Needs to be switched out every 3-6 months, depending on how much ABS/ASA you print.
- [12V power supply with molex adapter](#).
- [6x fan hub](#). This one is for 3 pin fans but 4 pin PWM ones can also be connected, they will simply run at their maximum speed.
- Mounting screws, should be delivered with the fan.
- Electrical tape or any other insulating material for the fan hub.

Notes

If you feel like the organic compounds are not sufficiently filtered out (i.e. the room does not pass the sniff test) just add a second charcoal mat on top of the other.

Should your enclosure be rather big like mine use two air purifiers, that way the enclosure is always under negative pressure which ensures that no gasses or unwanted smells escape.

Model files



filterhalter.3mf



filterhalter_matte.3mf

Print files



filterhalter_matte_02mm_pla_mk3s_18m.gcode

PLA 0.40 mm 0.20 mm 0.30 hrs 3 g Prusa MK3/S/S+



filterhalter_hepa_02mm_pla_mk3s_11h32m.gcode

PLA 0.40 mm 0.20 mm 11.53 hrs 129 g Prusa MK3/S/S+

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