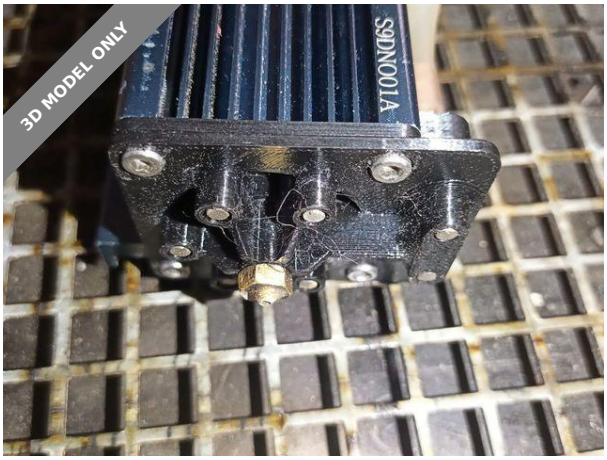

Sculpfun S9 Quick change Air Assist Nozzle (improved version, no air leakage) [small calibration block update]

w wfvn

VIEW IN BROWSER

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Summary

For my Sculpfun S9 I created a quick change nozzle for air assist using a E3D printer nozzle.

Hobby & Makers > Tools

Tags: air assist cutter cutting diode engraver engraving laser nozzle

improved version

[small update: new version added with 3 cutouts for more places to put the calibration block.

Disclaimer: I don't know if the lower nozzle parts are strong enough since material is taken away. Also you might just use the new fixed part, use those cutouts for the calibration block and after calibrating just pop on the nozzle without the cutouts)]

I like my old E3D air assist nozzle a lot. But sometimes it's better not to have a nozzle close to the object. For cutting the E3D nozzle is great but for engraving not so much. Because I don't want to keep on screwing and unscrewing, I decided to try to make a nozzle which can be changed quickly.

So I changed my older model. I made some tunnels for magnets. With the use of 7 magnets on each part (fixed body has 7, each changable nozzel also has 7).

Press the magnets (neodymium rods 3mm diameter, 6mm length) into the tunnels.

Depending on your printing tolerances, you might need to drill the holes a little wider or use glue to hold the magnets in the holes.

Jus screw the fixed main body onto your laser head. The tube for the air assist can also stay in place. Just pull off the lower changable nozzle part and click on another. Easy as that.

To prevent air from leaking through the gaps, I used a 5mm thick ‘closed cel' foam. With the laser I cut some rings I place in the holes which should be 'air tight'

The holes are slightly less deep than the 5mm thickness of the foam so the magnets will compress the foam, creating an ‘air tight’ connection. This is my 3th version but also my last. This thing works like crazy

Right now I have 2 nozzles: 1 open nozzle with a 5.5mm diameter hole around the laser beam. Also I have another nozzle which is a E3D nozzle which is drilled wider to 1.5mm diameter. To create a 4mm distance between the nozzle tip and the object to cut/engrave, I cut off some of the thread side of the E3D, otherwise the E3D would block the opening for the air coming into the nozzle. If you use an original length E3D nozzle, you can screw it into place while having a 1mm distance between the object to engrave/cut and the nozzle tip.

[small update]
When no air assist is needed (but the pump is running to prevent fumes reaching the lens), I use the open nozzle. When I do need air assist, a E3D nozzle with 2mm drilled hole works best for me. In that case I use the version with the nozzle about 3mm above the surface.
[/smalll update]

Used screws: RVS M3 x 10mm Hex rocket cap screen.

I've added 2 protector rings. Use screws from the inside through the holes. The heads of the screws will be attracted by the magnets of the nozzle.

Thanks go to https://www.printables.com/social/110635-kkolodziejczak/about . His feedback is used to change/improve my model.

Used pump:

UBBINK Air 200 Indoor Airpumphttps://www.hornbach.nl/shop/UBBINK-Air-200-Indoor-luchtpomp/3841160/artikel.html

Laser picking up nozzle and quick change to another nozzle:

Air assist with 1.5mm E3D blowing in water:

12mm wood:

Cutting foam rings for preventing air leakage:

Model files

sculpfun-s9-air-assist-e3d-nozzles-all-parts.3mf

sculpfun-s9-air-assist-e3d-nozzles-all-parts-cali.3mf

sculpfun-s9-air-assist-nozzle-minimal-length.3mf

sculpfun-s9-air-assist-nozzle.3mf

sculpfun-s9-air-assist-e3d-nozzle-maximum-length.3mf

sculpfun-s9-air-assist-e3d-nozzle-minimum-length.3mf

sculpfun-s9-air-assist-nozzle-fixed-body.3mf

sculpfun-e3d-nozzle-rubber-rings-to-lasercut-from.dxf

2 smaller rings for bottom side of the fixed body. 1 larger ring for the top of the fixed body

sculpfun-s9-air-assist-e3d-nozzles-protector.3mf

sculpfun-s9-air-assist-e3d-nozzles-protector-bigg.3mf

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