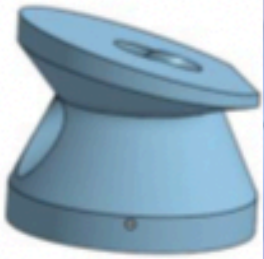
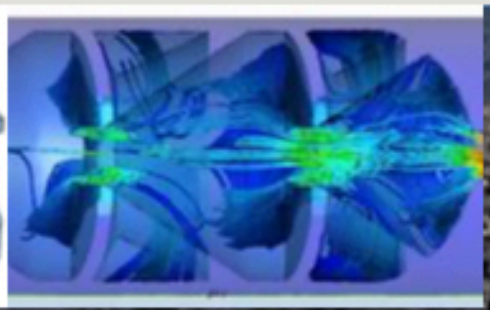
FTN.3

3D PRINTED RIFLE SUPPRESSOR





TESTED IN SUPERSONIC 5.56, 7.62X39, 308, .458 SOCOM

BROUGHT TO YOU BY PLA.BOI AND DETERRENCE DISPENSED

Introduction:

The FTN.3 is a culmination of several years of study and design and testing. Really the previous designs (DMD9, FTN.1, and FTN.2) were just the build up to get to this current project. Basically, this is the actual suppressor I have wanted to achieve from the beginning.

There is a rifle rated can (tested in supersonic 5.56, 300, 308, 7.62x39, 9mm).

There are a few pistol models (9mm and 45).

For the rifle, there are several attachment methods (3/4 x 16 thread adapter, KAK flash can, Breek arms). There are also several reinforcement options (fiberglass/resin, carbon fiber tube).

The "cadillac" model would be a rifle suppressor, in glass or CF filled nylon, reinforced with a carbon fiber tube, and utilizing Breek Arms castle forwarding can and muzzle device, all for under $100.

The basic model has been proven to work in PLA+, but I recommend limited 308 if in PLA+. If you want to shoot a lot of 308, I recommend printing in filled nylon or using the beefier dedicated 308 can. If this is something you are going to drop $200 and form 1, you should probably use GF/CF nylon. There is also a K can variant, which is smaller. The K can is NOT rated for 308.

The thread adapter, and the KAK/Breek forwarding device can be retrieved and reused. The carbon fiber tube will not be able to be reused. If you plan on using the CF tube reinforcement, I suggest using GF or CF nylon.

Here is a link to assembly video

"If a law is unjust, a man is not only right to disobey it, he is obligated to do so." -Thomas Jefferson

Acknowledgements:

This suppressor could not have been possible without the tireless efforts and thousands of hours of print time by my beta testers on deterrence dispensed. I could not have asked for a more based group of testers.

I'd like to thank amenpa, beecher, bogadh.go.luath, CW, bonaparte.fiddalus, classy.raptor, coprolite, DovahDeinmaar, DelRiv, FLuXX_PwR, freedom.week1776, heythere78, krrawn, .just.call.me.paul, ned5021, PaganGiraffe, PecosBill, ThatGuy77x, ethan.hall, grvin19, 333mutt, ima.lilguy, joe.schmoh, leftyshooter80, nikolai.romanov, quasar, Peacekeeper2024, pecosbill, Plumindian, The_Random_Taco, WhoAmEye, scnettek, v1812, zstoner

These guys have spent a lot of time, effort, ammo, and money to be able to test this. Many beta testers spent $400 bucks or more to be able to make this suppressor a reality. Many have spent enough to fund a commercial suppressor.

However the MVP of this beta has got to be [redacted], who was an absolute mad lad. Fueled by ADHD and a completely Free Man, he spent countless hours printing, filming, testing with complete disregard of personal safety. [redacted] single handedly made this suppressor possible. Thanks, king. You know who you are.

Special thanks to shadowhunter55, who spent a lot of time teaching me how to CAD.

Also this is dedicated to Ruby, RIP. She would have been so excited by all of this, and would have made a better can than I could.

Before we begin: Please read this document and watch the assembly videos carefully. This is not a build that you want to be sloppy with.

There is a low tolerance for error, and a poorly constructed suppressor will blow up immediately. A properly constructive one will last for hundreds of rounds.

Safety note: when cutting fiberglass or carbon fiber, wear PPE including respirator, in a well ventilated area.

Take your time, do it right.

Models:

For each suppressor design, there are 3 attachment methods:

-Thread adapter (can use ½ x 28 to ¾ x 16 or 5/8 x 24 to ¾ x 16)

-"free man" or form 1 version (has cutout for washer)

-KAK micro flash can (1/2x28, 5/8x24, 1/2x36, M13.5x1LH, M14x1LH, .578-28)

-Breek Arms flash hider/muzzle brake (1/2x28, 5/8x24) which is externally threaded 13/16x16 for use with their castle flash can

For the KAK and Breek, the flash can is embedded with reinforced epoxy resin into the suppressor.

- **Standard versions** are for 556, 7.62x39, 300, 9mm, and limited 308 if printed in PLA
- **45 caliber version** is for 45 ACP, 458 SOCOM
  - KAK micro flash can (.578-28) for 45 ACP
  - Breek Castle Shield with a 13/16x16 externally threaded muzzle device for .458 SOCOM (unbranded versions commonly found on ebay)
  - DB TAC All Steel .450 Bushmaster Muzzle Brake 5/8''x32 TPI Thread With Sound Forwarder 13/16''x16 TPI Thread - DB TAC

    - Muzzle Brake 5/8x32 TPI Sound Sleeve Forwarder 13/16-16 for .458 Socom – TACFUN (tacfunusa.com)
- **308 dedicated:** If all you can print is PLA and you want to run 308
- **Carbon Fiber Tube** versions: To be printed in CF/GF nylon. Uses carbon fiber tube (50mm OD, 47mm ID).
- **K can:** for 5.56, 300, 7.62x39, 9mm. Cannot handle 308. Also sized for CF tube sleeve

Materials:

- high quality PLA plus (esun, polymaker, or equivalent). Or glass filled or carbon fiber filled nylon.
- Epoxy resin 

- Breek Arms Castle Blast Shield and Flash hider/Brake (use code CAROLINAEDC for 10% off of breeks site, ships free) SKU: BRK4038

  Breek Arms CASTLE BLAST SHIELD Concussion Device

  Upper Parts - Muzzle Devices - Breek Arms

- KAK micro slimline flash can (SKU: MICRO-SLIM-FLASH-CAN-999)

  Micro Slimline Flash Can - Muzzle Device for Enhanced Firearm Control (kakindustry.com)

- 1/2x28 to 3/4x16 thread adapter or 5/8x24 to 3/4x16 thread adapter (they exist but are harder to find). Steel preferred, aluminum will not last. If you want the can to be on a 300 and 556 rifle, you will need both adapters. For 556, you will nest one adapter in the other. For 7.62x39, you can use the Hughes Precision M14x1LH to 1/2x28 adapter (SKU# 140) or similar adapter.


- fiberglass cloth 8” width. Can be found on amazon. Walmart also carries them in the auto section as large sheets that will need to be cut to size

- Carbon Fiber tube (you need 50mm OD, 47mm ID).

- Wire brush if using carbon fiber tube


- For Form 1 engraving, you need 1-18 x 1-¾ x 18GA machine bushing
    - Hillman Part #882576

Print:

Print horizontally, on its side. The file should be preoriented. I am not super picky about settings, as it will be reinforced. I used:

215-220 hotend

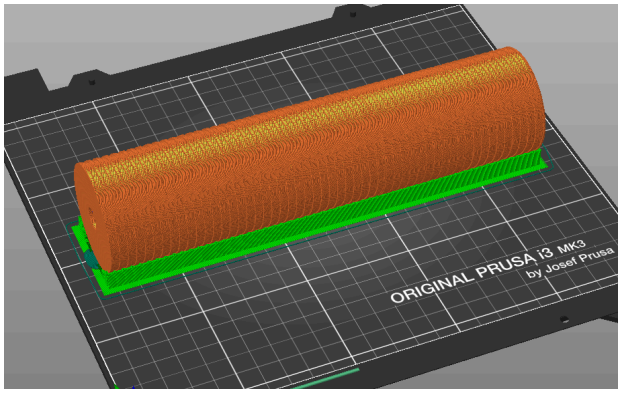
60 bed

Supports on buildplate only, and use brim

Layer height 0.16 or 0.2

8 walls

100% concentric infill (this is the most important setting)



There will be a rough bottom side of print from overhangs. THIS IS NORMAL. Use a knife to shave off any boogers, to try to get it as smooth as possible. If you don’t do this, there will be a gap when you try to wrap with fiberglass

Even though I am not picky about the print settings, your printer needs to be tuned.

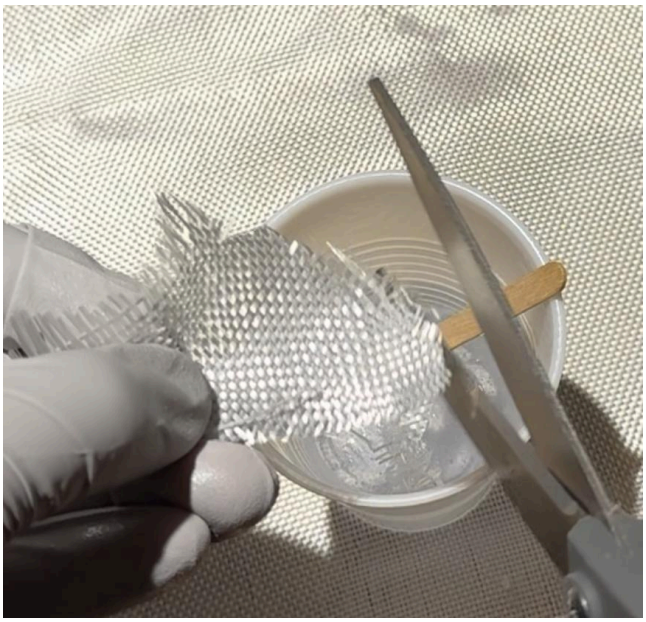
Assembly:

First step is Reinforcement

1) Fiberglass/resin: Needs 8" width fiberglass cloth (I purchased on amazon). Use approx 27 inches per suppressor (35 for 308). You can use more if you want extra reinforcement. Lay it out, and line it up with the MUZZLE end of the suppressor (not threaded end). Depending on which model you print, there may be some bare printed portion, near the threads, that is okay. Use tape as an anchor point

2) Warm up epoxy resin components separately in microwave for approx 10 seconds to make this easier. DONT make too hot.

3) Mix epoxy resin. Take a pair of scissors and chop up about 1” square of fiberglass cloth. This will create a jelly-like consistency.



4) Pour this jelly mixture all over the print. **(If doing CF tube method, skip steps 4-6 and scroll down for assembly instructions)**

5) Carefully roll the suppressor in the fiberglass cloth as tight as possible. Any airgap between the fiberglass and the print is a potential source of failure.

6) Sit it, threads up, on a small plastic cup. Resin will drip down the sides. When dry, cut frayed edges with razor blade.

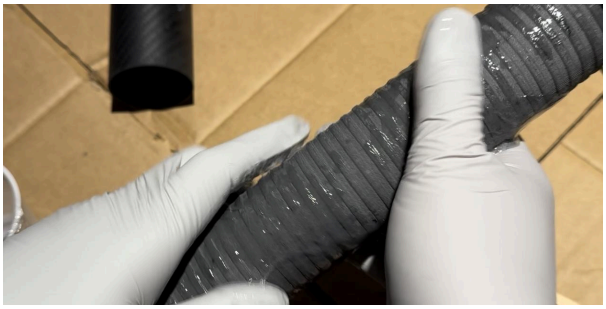
Allow for a full cure. 24 hours would be the bare minimum, 48 hours recommended

Carbon Fiber Tube reinforcement assembly: After step 4, proceed to this step instead of step 5.

1) Cut CF tube to length. (Use respirator, eyepro, gloves, I used dremel grinding wheel).

2) There is a nonstick coating on the inside of the CF tube from the factory. This needs to be removed for the epoxy to stick. Use a wire brush and also acetone/isopropyl alcohol to remove this.

3) Slather the chopped fiberglass reinforced epoxy over the print



4) Insert suppressor into CF tube. This is permanent, cannot be retrieved.

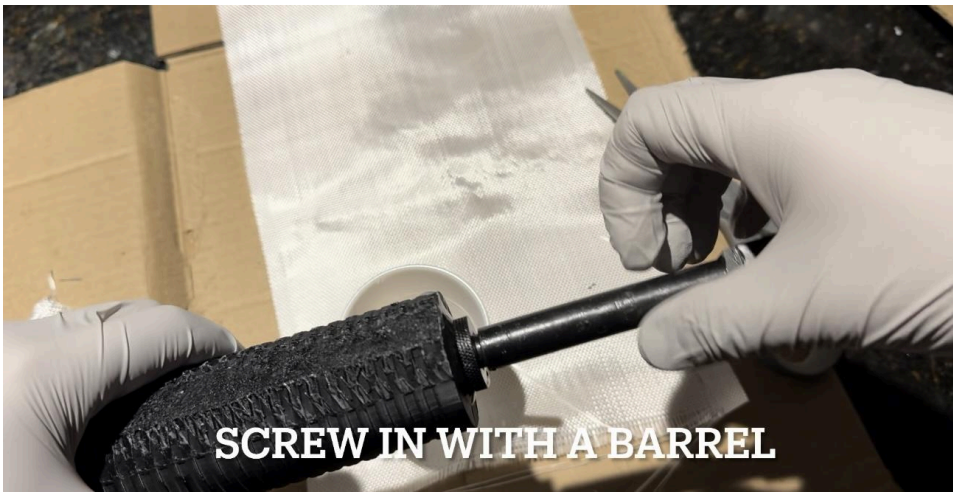
Allow for a full cure. 24 hours would be the bare minimum, 48 hours recommended

After Reinforcement, you now need to apply one of the following threading methods. Option 1 is the Thread Adapter method. Option 2 is Breek/KAK. If using Breek/KAK, skip the Option 1 instructions, and see the Option 2 instructions.

Option 1: Thread adapter

1) Epoxy in washer if using Form 1 FIRST (wont fit after). Otherwise, the first step is to apply epoxy resin to threads.

2) Using a threaded barrel, screw in a thread adapter. Options are 1/2x28 to ¾x16 or 5/8x24 to 3/4x16.



Option 2: Breek/KAK

1) Using a threaded barrel, insert the Castle Blast Shield or KAK flash can into the print.

2) Chop up about 1” square of fiberglass cloth.

3) Sprinkle this into the empty cavity between the flash can and the print.

4) Pour epoxy resin into the empty space up to the brim. Add washer at this point if using form 1

Allow for a full cure. 24 hours would be the bare minimum, 48 hours recommended

Protips:

- To get the Breek/KAK out, the best way is to directly hammer the resin and PLA that surrounds the breek. It will shatter the resin, and the muzzle device will be removed
- Nesting thread adapters: If you get creative with nesting thread adapters, you can use the same suppressor on multiple calibers.
    - For example if you attach a 1/2x28 to 3/4x16 adapter to the print, you can use a 5/8x24 to 1/2x28 adapter to attach to firearms with 5/8x24 threads
    - If you attach a 5/8x24 to 3/4x16 adapter to the print, you can use a 1/2x28 to 5/8x24 to attach to firearms with 1/2x28 threads
    - For AK's, you can use a 1/2x28 to 3/4x16 adapter attached to the print and M14x1LH to 1/2x28 adapter to attach to the AK
- Hockey Tape wrapped around the suppressor makes for a very clean appearance, and covers any fiberglass edges

- To cut fiberglass tape without fraying, use a strip of painters tape on the edge
- Carbon Fiber weave may be a stronger alternative to fiberglass cloth. This has not been extensively tested but on paper may be better
- Use a couple small strips of tape to tape the fiberglass cloth to the print, before adding resin and rolling. This prevents it from slipping while rolling

Troubleshooting:

- Suppressor blew out a wall in first few shots- fiberglass/resin not applied correctly, there must have been an airgap with a wall portion that was not reinforced. Or you didnt wait long enough for resin to cure.
- Suppressor flies off of Breek/KAK. Epoxy/resin stays in print - use different brand epoxy resin, make sure you are using chopped fibers
- Thread adapter rips through printed threads - put a hose clamp around the print, after reinforcement, at the base where the thread protector sits

- When pouring the resin, resin leaks into the can. Make sure printer is tuned, and you tap the breek/kak in tight. To try to salvage it, dump out what you can, and let the resin dry with flash can in place. Once dry, there should be a good seal, and try again to pour into the cavity
- The print came off of the muzzle device and the resin is wet: you did not mix at the correct ratios or you need to find a different epoxy resin. It should be hard, and after curing should not be wet even when heated up. It crumbles when heated up enough, doesn’t turn liquid.
- If you still need help, reach out to me. I'm never too busy to help someone trying my build. My goal os to get as many printed suppressors out there as possible.

FAQ:

Q: Why is this printed horizontal?

A: Layer adhesion is always the weakest point. Upright printing optimizes hoop strength. Horizontal printing optimizes axial strength. Of the two, hoop strength is easier to reinforce. An example of axial strength reinforcement is the Hush Puppy.

Q: Can I run 308 through the intermediate cartridge models?

A: very limited 308 can run through it. The bore is big enough, but it is overpressured and can cause wall rupture or shear the can off the muzzle device

Q: Can I do threads, and then reinforcement?

A: Yes order does not matter

Q: Can I resin coat the internals, like FTN.1?

A: No, the K baffle geometry would trap the resin, and not allow it to drain out

Q: Can I print in other materials?

A: Yes, filled nylon should outperform PLA plus

Q: Will this work on subsonic 300 blackout?

A: Not sure, I don’t have one. If you try it, let me know.

Q: How can I make my can last as long as possible?

A: Take breaks between shooting, limit rapid fire. Heat buildup is what will degrade it the most

Q: Why is my point of impact shifting so much?

A: Likely your adapter is not perfectly concentric. Reprint and try again

Q: Why is my grouping wider than before?

A: Find a drill bit around 13 mm or 14 mm, and pass it through to widen the center bore

Q: How can I make my can even quieter?

A: Put vaseline or peanut butter

Discussion:

A rifle rated printed suppressor has always been my goal from the beginning. There had to be several deviations from conventional design, due to limitations and also advantages of FDM.

First, conventional wisdom dictates that traditional cones are superior for rifle cans to K baffles. However due to the tendency of printed material to soften and fold in response to heat in pressure, there is more support needed at the bore. Therefore K baffles are utilized.

The K baffles however are redesigned, taking advantage of FDM into a shape that cannot be machined easily. First, they are slanted, which causes the gasses to be diverted to the side. There, there is an opening into the lower chamber. This would be the traditional place for a mouse hole (which have been controversial and probably doesn't do anything). However it is much bigger, and along with the tilt, directs gasses into the secondary chamber, and has to circle around to escape. For this reason, this is less of a mouse hole, and more of a "mouse trap".

Of course, pressure is the first big obstacle, and in addition to the obvious reinforcement, being larger than a typical metal can helps significantly with decreased pressure (Boyle's Law). It's hard to look at the numbers to understand how big of a difference, without doing the math.

A 2" diameter suppressor (50mm) vs typical 1.5" diameter suppressor (38mm) yields a ~49% increase in volume.

Going from 50mm to 55mm yields a 27% increase in volume.

For fiberglass cloth/resin there is no limitation, but for CF tube and PVC pipe, there are limitations based on what is commonly

available for purchase, that is why there are smaller versions available for the CF tube. This, along with the fact that the CF tube is permanently attached to the print is why I recommend the CF tube version to be printed out of filled nylon or other longer lasting material.

If any feedback, suggestions, or if you want to beta test new designs you can find me on:

Reddit: u/plaboiii

Rocketchat: pla.boi