

# Resonant Cavities

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# Version 1 - Single Hexagonal Design - Doesn't Require Machine Tubing

Author does not accept and liabilities/responsibilities for those individuals who chose to build the below cell. This information on this site is for educational purposes only.

Chris Bake using this design: [10 Cell Tubular Resonant Cavity](#)

My YouTube video: [My Video](#)

Cavity shown on Chris Bake's YouTube channel: single cavity with entry/flow holes at bottom. Accepts 3/4" (19.05mm) and 1/2" (12.7mm) stainless steel tubes. Nuts recessed are sized for 10-32" stainless steel nuts, and 10-32" stainless steel (18-8) set screws. Top accepts 1/2" long 10-32 set screws, bottom accepts 5/8" long 10-32 set screws. Holes are sized for 10-32 tap to thread if desired. 3D filament is regular PETG. Should only need 1 spool of filament, as all prints were done at 50% infill.

Supplier Sites: [10-32 SS Nuts](#) , [1/2" 10-32 SS set screw](#) , [5/8" 10-32 SS set screw](#) , [1/2" OD, 0.065" Wall, 0.375" T-304 SS Tube](#) , [3/4", 0.035" wall, 0.68" ID T-304 SS Tube](#) , [T-304 SS connecting wire](#) , [PETG Filament](#) ,

[hex resonant cavity with flow holes \(2\).stl](#)

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Base plate that accepts 10 of the single resonant cavities above. The cavities outer body will need to be filed a little to provide press fit into the below plate. Holes on the outer edge are for 6-32" tap if so desired to prevent resonant cavity from coming out if loose fitting happens.

[WFC base plate v1 v0 \(2\).stl](#)

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Depending on the vessel diameter used, the base plate may need to be reduced in OD. I accomplished this with a bench grinder and sandpaper. Needle nose pliers are helpful in tightening connections. A 10-32 tap was run through holes that set screws go into. Connect two in series at a time for easier construction/wiring. The OD diameter of the base was intended for the 5.75" ID acrylic tube I used. However, any clear vessel or bucket can be used for testing. Nothing specific for the base being 5.75" OD.

The 3/4" SS tubing needs cut to a length of 3.00"

10 qty total needed (total length of 30.00" minus blade width for 10 cuts, approximately 5/8", need 31" total)

As of 12/01/2022 above supplier has 36" length for \$21.71

The 1/2" SS tubing needs cut to a length of 3.50"

10 qty total needed ( total length of 35.00" minus blade width for 10 cuts, approximately 5/8", to 36" total)

As of 12/01/2022 above supplier has 36" length for \$37.34

Many methods for cutting can be used, whichever is available to the builder.

As of 12/01/2022, PETG filament is \$20.00

20 qty, 10-32 SS nuts (\$0.08/ea)= \$1.60

10 qty, 10-32 x 1/2" SS set screws (\$0.17/ea) = \$1.70

10 qty, 10-32 x 5/8" SS set screws (\$0.20/ea) = \$2.00

As of 12/01/2022 above supplier has SS wire for \$7.99

With the itemized list above, the cost to print/assemble this cell is approximately: \$92.34

Version 2 - Two Cell Holder -  
Requires Machined Tube  
Sets

# Version 3 - Single Cavity Holder - Requires Machined Tube Sets

# DIY Inner Electrode Machining Template