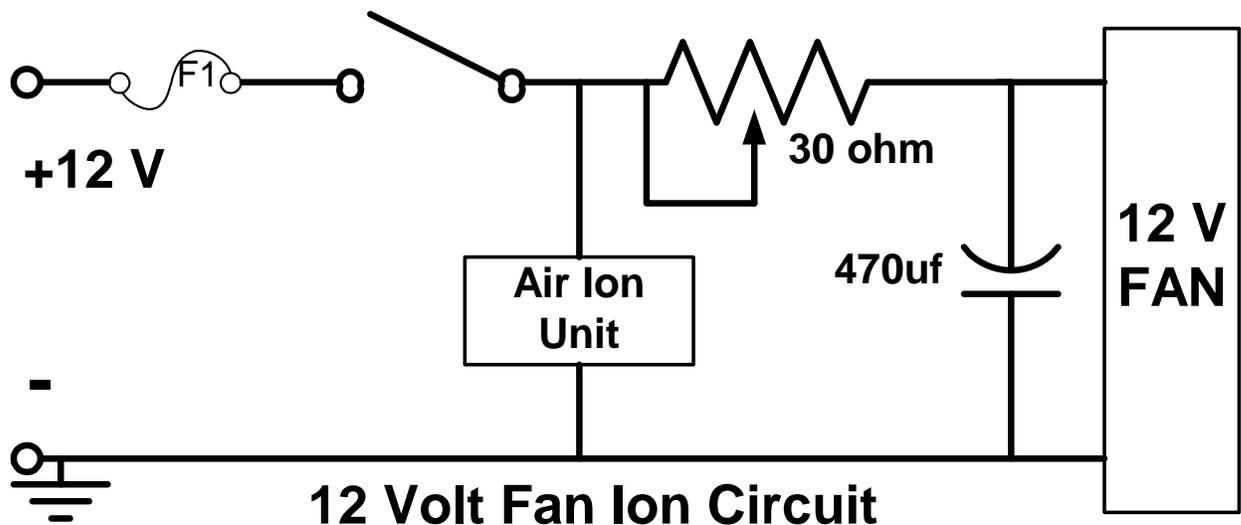


# How to make a low cost efficient 12 Volt Air Filter with Ion Production

## Three types of filters elements were tested.

- 1) HEPA Shop-Vac filter VF2006 from Home depot for \$19.97. Average time to fill a kitchen 13 gallon garbage bag to about 1.5 cubic feet was measured to be 43 Sec. This unit filters air at about 1 cu.ft/min.
- 2) Wet/Dry VF2007 Replacement filter from Home Depot for \$9.96. Same garbage bag took 12.5 sec to fill to the same amount. This unit filters air at about 7.5 cu.ft/min.
- 3) This started out as a flat filter 20 by 25 by 1 (1700 rating 3M Ultimate Allergen UA03DC-6) that cost \$20.97 from Home Depot. An end was cut off and the filter element was wrapped and glued into a cylinder to make this filter. The same garbage bag took 6 sec to fill with out a filter and 8 sec with the filter element. This unit filters air at about 11 cu.ft/min.

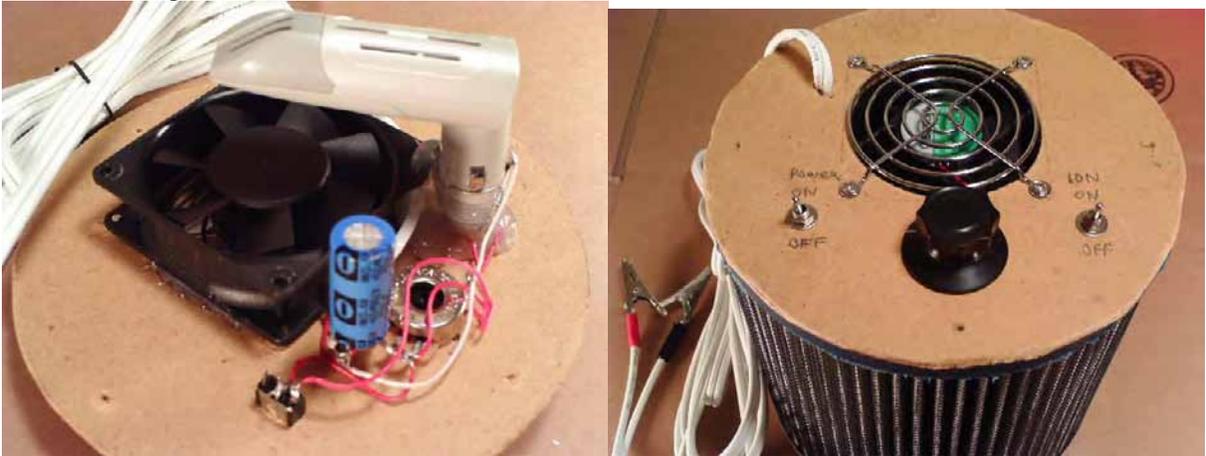


The fan was a used 3" by 3" box or muffin fan that was rated for .15 amp. It measures 151 ma at 12 volts. The Ion unit measured .067 amps at 12 volts. The combination when running on fast setting uses .218 amp at 12 volts. This is 2.62 watts power usage at maximum. At minimum speed the fan uses .063 ma and the power usage for the unit is 1.56 Watts. The input voltage can range from 10 to 14.5 volts and both fan and ion unit will still run.

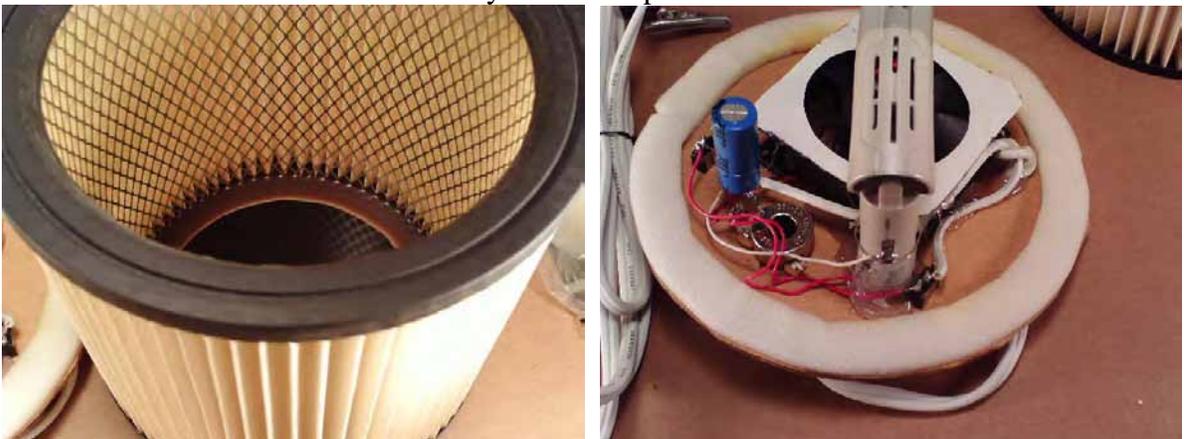
A charcoal filter was not added, but could have been if it is needed.

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The following unit uses number one the HEPA filter. It filters air at about 1 cu.ft/min.



The next unit uses the standard wet/dry vacuum replacement filter described in number 2 above.

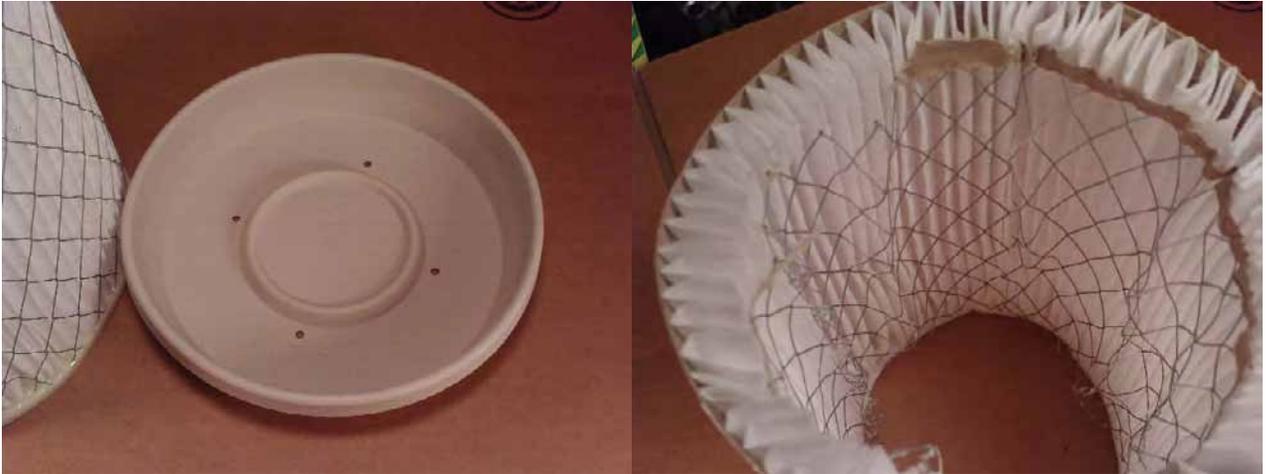


Foam weather stripping was used on the ends to help the air seal. Sheet metal screws were used to fasten on the ends. The Automobile air purifying Ionizer unit was purchased from wall mart on sale for under \$10. This type of unit typical plugs into a cigarette lighter socket.

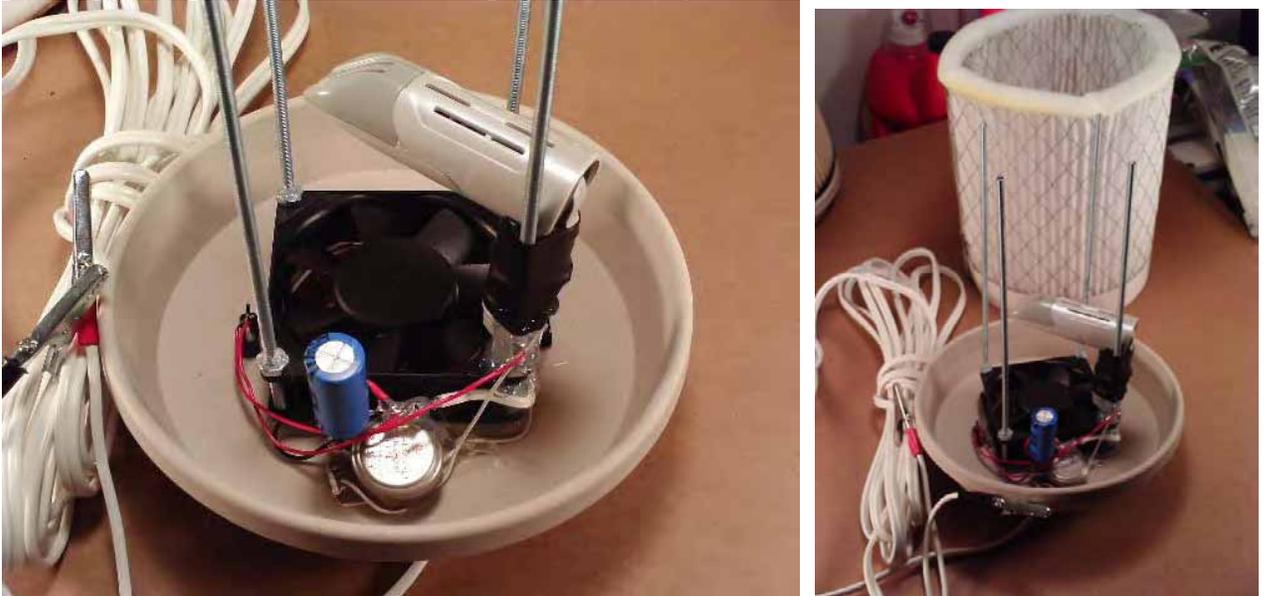


The finished unit is show above. This unit when on high-speed filters air at about 7.5 cu.ft/min.

## How to make a low cost efficient 12 Volt Air Filter with Ion Production



This filter number 3 was made from a flat filter element using a common hot melt glue gun. An 8" plastic planter pot tray from Home Depot (51608 Gray) for \$1.18 each was used for the ends.



The filter element is bent into a cylinder and then foam rubber weather stripping was put on the ends to seal any air leaking in. Number 8-32 threaded rod was used to hold the unit together (purchased from home Depot).



The unit filters air at about 11 cu.ft/min.