

## Exhaust Filter for Harbor Freight Oil Vacuum Pump

If you are using a Harbor Freight oil vacuum pump for any length of time, you will get a fine (submicron) oil mist out of the exhaust port on top of the pump. This mist will look like smoke and is very hazardous to breathe. There are commercial filters available, however, they cost several hundred dollars. The homemade filter described below will stop all oil mist emissions from the pump and is easy to construct and relatively inexpensive (about \$45, mostly because of the cost of the furnace filter). I have been using this filter for 18 months and it still stops all oil mist. It appears that the oil mist is collected in the filter and drains back into the pump.

Figure 1 shows it on the pump. It is the tall white cylinder on the left side of the pump. The small black part in the lower left side of the box is the cap that came on the pump, which does nothing to capture the oil mist.



Figure 1. Filter in place on pump.

Figure 2 shows the components used in the construction alongside of the finished filter. The component parts consist of the following:

1. A  $\frac{3}{4}$ " PVC plug
2. Fiber wound water filter (2 pack Whirlpool Whole House Water Filter WHKF-WHSW from Lowes - item# 149007 – about \$9)
3. A 2" X  $1\frac{1}{2}$ " PVC reducer
4. A  $\frac{3}{4}$ " long piece of  $1\frac{1}{2}$ " Schedule 40 PVC pipe (not shown)
5. A  $\frac{3}{4}$ " threaded X 1" PVC reducer
6. Filter fabric from a furnace filter – not shown (Filtrete 1900 Maximum Allergen air filter from Lowes - item #134507 – about \$19. Do not substitute with a lower cost filter, as it will not stop the oil mist)
7. Hot melt glue
8. PVC glue



Figure 2. Black original Harbor Freight cap, components for making new filter and finished filter.

To construct the filter:

1. Glue the  $\frac{3}{4}$ " long piece of  $1\frac{1}{2}$ " Schedule 40 PVC pipe into the 2" X  $1\frac{1}{2}$ " PVC reducer.
2. Mount the  $\frac{3}{4}$ " threaded X 1" PVC reducer in your lathe by the large end and turn the threaded end so it will easily screw into the exhaust port of the vacuum pump. Turn it around, chuck the threaded end and turn the outside diameter of the other end so it will fit into the  $1\frac{1}{2}$ " PVC pipe from step 2 and glue it with PVC glue.
3. Glue the plug into the top of the filter with PVC glue. Also seal the rest of the exposed top with PVC glue (the blue area on the left end of the completed filter).
4. Glue the other end of the filter into the PVC adapter with hotmelt glue. Make sure it is completely sealed around the edge of the adapter.
5. Carefully remove the pleated filter fabric from the furnace filter to prevent making any holes and cut a strip as wide as the exposed length of the fiber wound filter (about 9" wide). Wrap it around the fiber wound filter several times and tape it along the side to hold in place. Go around the top and bottom of the wrap with the hotmelt glue to seal the edges. With the pump running, look for any leaks and seal them with hotmelt glue.