

## Rotary Pump Dual Filters

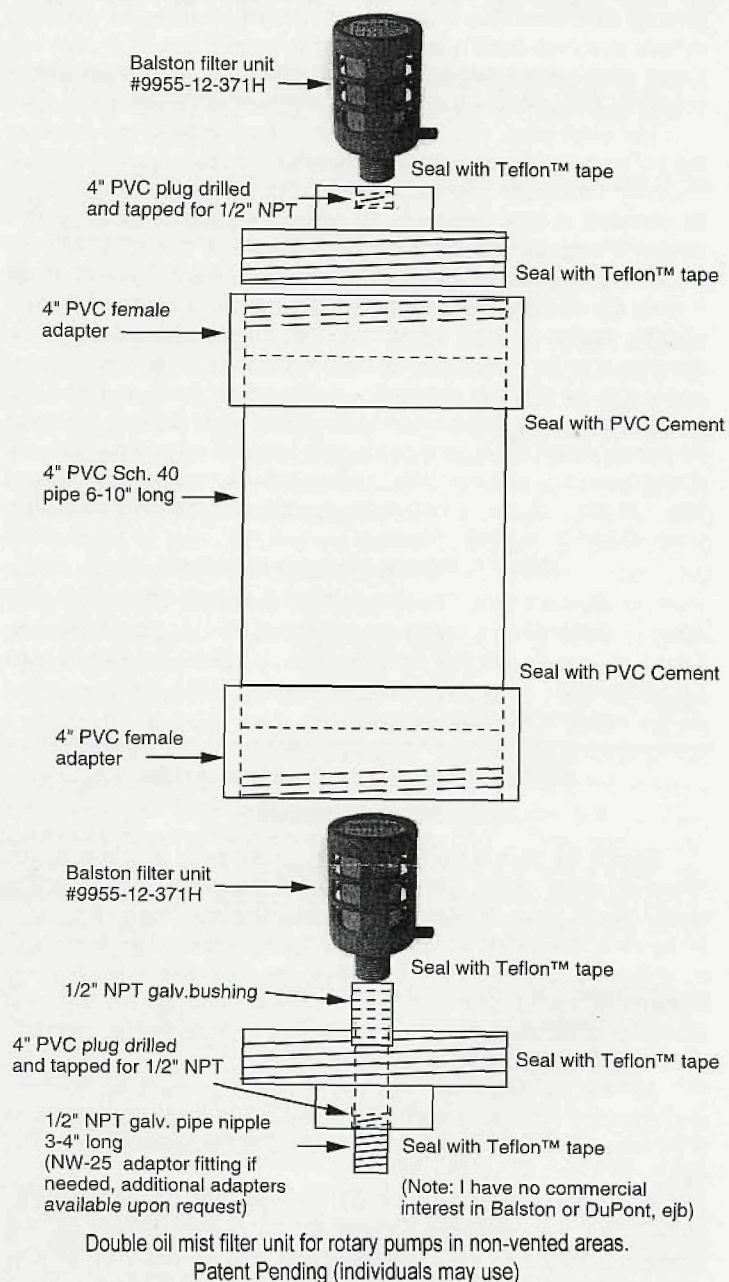
Ed Basquall, Penn State University  
edb@chem.psu.edu

Rotary vacuum pumps are used in virtually every research lab, especially those engaged in vacuum science such as electron microscopy and mass spectrometry. In the majority of these situations the exhaust can and should be vented to the outside. Unfortunately, many labs lack this capability. Oil mist vapors emitted from pumps under a load can be quite annoying and may be a potential health hazard. Pumps located in small confined spaces such as microscope rooms, darkrooms, etc. are particularly a problem. Often the manufacturer supplied filters are either inadequate or poorly maintained. I have encountered this situation in several microscopy lab settings and have designed and constructed a simple dual filter housing unit which more effectively reduces emissions. Materials are readily available in most hardware or home building supply stores.

The filter housing is designed to accommodate two (or three) disposable #99-12-371H Balston filter units having 1/2" NPT (National Pipe Thread). Balston filter units are available for \$30.12 US from Scientific Instrument Services (908-788-5550, www.sisweb.com). I have no financial interest in this company. One filter is threaded into an inner female 11/2" NPT coupling and the other is threaded into the outside top of the unit which has been drilled out and threaded with a 1/2" NPT tap (see drawing). If a third filter is desired, it may be attached upside-down to the upper 4" PVC threaded plug via an additional 1/2" NPT nipple and two couplings. The entire unit is threaded onto an adapter sized to fit the pump exhaust opening.

A few pump manufacturers use non-standard thread sizes on the exhaust port. These require some innovative machining or purchase of costly adapters from a vacuum component supplier (\$60-\$75). For example, Sargent Welch Models 1380,1402,1403, 8806, 8811, 8816 and 8821 use 1" x 20 TPI (threads per inch). A PVC or aluminum adapter can be easily custom threaded by a friendly local machine shop.

The filter units are easily replaced by disposing of the lower inner filter and shifting the upper ones down to the respective vacant positions. A new filter is used as the final top outer filter. For labs struggling to make ends meet this is the most efficient utilization of filters and provides breathable air in confined rooms. The unit can be constructed by a handy person in a few hours from 4" dia PVC pipe and fittings. Alternatively, I would be willing to supply housing units for a modest fee of \$1 00, plus shipping and tax where applicable. (Custom adapters and Balston filters are not included).



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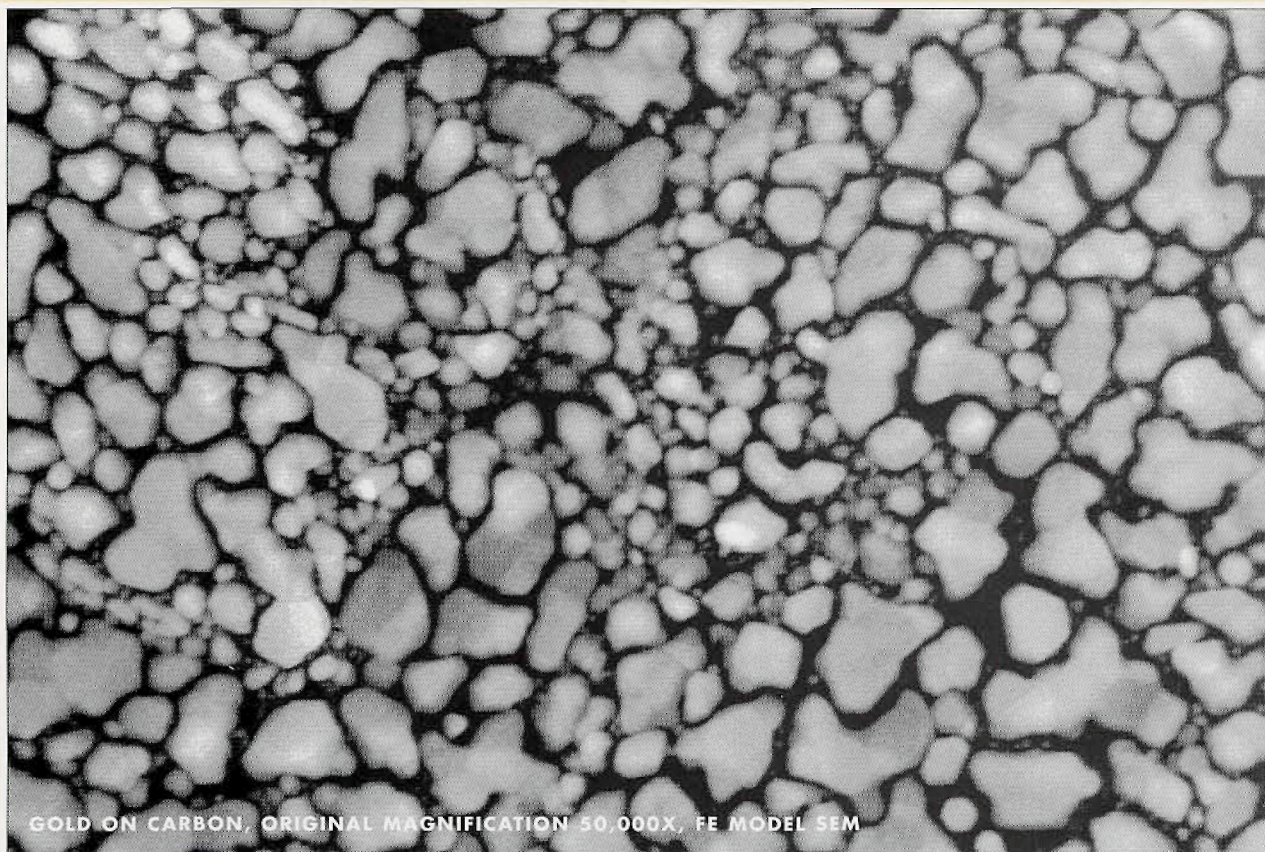
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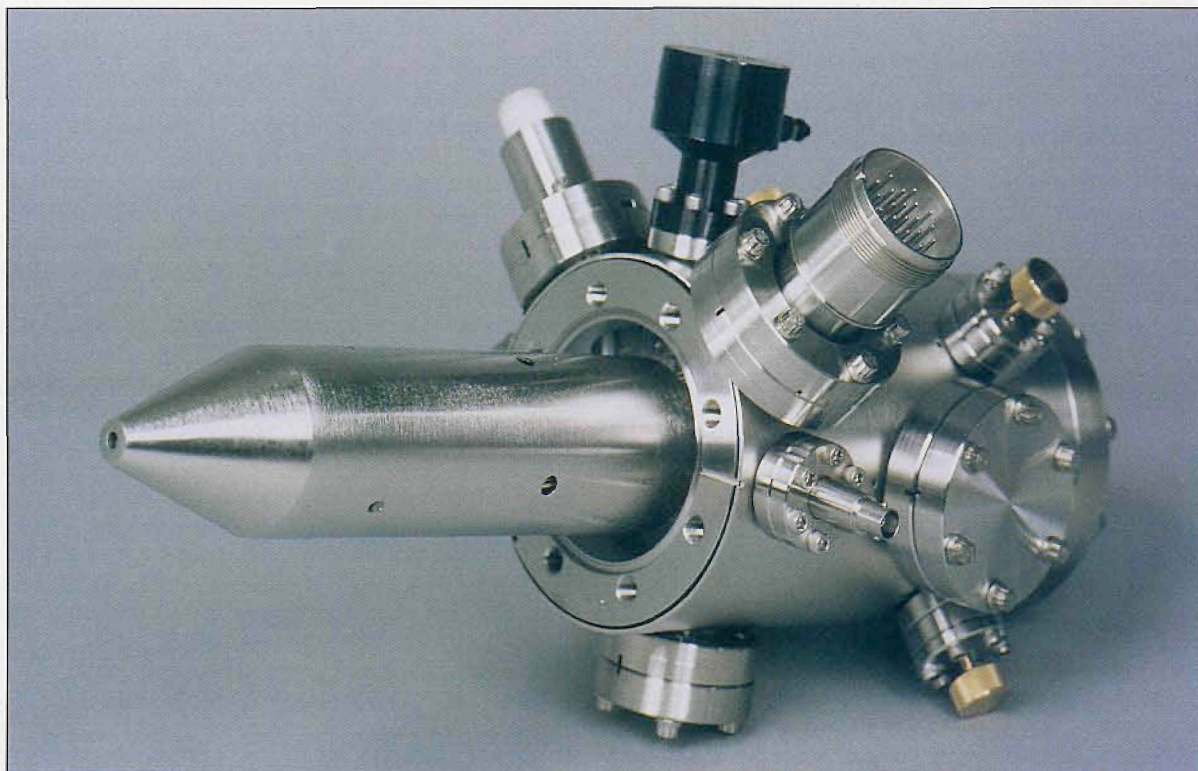
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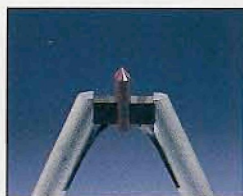
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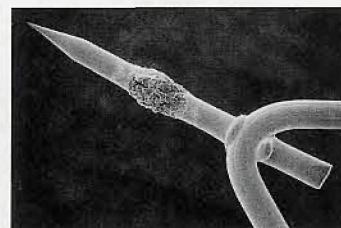
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