

# Combined hospital vacuum line sterilizing filter and VOC scrubber

<b>Customer:</b>	Medical device manufacturer
<b>Application:</b>	Vacuum exhaust line from bone cement applicator
<b>Products:</b>	Multifunctional in-line capsule filter
<b>Primary Motive:</b>	Supply chain simplification
<b>Location:</b>	USA
<b>Project Date:</b>	2020
<b>Division:</b>	Ashland, USA



**Customer Overview:**

Medical device manufacturer, providing intelligent medical devices and services from injury prevention to rehabilitation.

**Customer's Problem:**

As part of a licensing agreement to manufacture in the USA, the customer was seeking to find local suppliers for an existing application to use in their bone cement mixing chamber and applicator technology. While visiting the customer regarding the supply of another component in the cement mixing device, it was mentioned that the product used two other filters as part of its ventilation system. Porvair agreed to combine both products with a single SKU and thereby simplify their supply chain, whilst upgrading the design and improving performance.

**Porvair Solution:**

When performing joint replacement surgery surgeons need to prepare the fast setting bone cement at the point of use in the operating room. The methacrylate cements used in this process are very potent and give off potentially anesthetic gases. Methacrylate gas has also been linked to memory loss. As a precaution the dual purpose mixing chamber/syringe is connected to the hospital vacuum line and the gas is safely evacuated.

Prior to the gas being drawn into the hospital's shared vacuum system it passes through our filter, first through a 0.2µm particle membrane to sterilize it and then through an activated carbon layer to remove any volatile organic components/smell that might then be carried around the rest of the hospital.

**Project Overview:**

In order to make the product more compact, Porvair purchased new tooling to design the optimum solution.

The resulting product is now a design that can only be obtained through the customer and that cannot have either component parts reused.

The part replaces two previous SKUs. Due to the fact that this is a medical product the design has had to be validated through three stages OQ, IQ, and finally PQ.

There is an initial forecast for 60,000 units per year, placed directly by the customer. Subsequent orders will be placed by a third party, who will be adding the associated tubing and doing the final packaging of the complete unit.

**System Information:**

Hydrophobic 0.2µ PTFE single layer membrane with polyester backer, activated carbon impregnated mat, 5 layers. Custom coloured in-house 2-part moulded hardware; ultrasonically assembled.

**Other Opportunities:**

The in-line filter capsule design used here and some of the other products sold into the printing market would lend themselves to a similar potential of combining multiple filtration steps in a single unit.

This might include a pre-filter/filter arrangement such as:

- Pre-sensor gas conditioning
- Filtration / coalescing
- Filtration / desiccant