

Healthcare Applications

Fume Absorber

Porex cures offensive fumes emitted by bone glue used in surgical procedures with a simple, press-fit filter designed for the glue's mixing chamber.

The prognosis:
much happier operating room employees!



Design Challenge

A medical glue manufacturer found that its two-part surgical bone glue-- designed to be prepared in the operating room during surgical procedures--released fumes that were irritating to doctors and nurses. The manufacturer required an efficient air filter for the glue's mixing chamber to scrub the offensive off-gases.

Solution

Porex first analyzed various activated carbons to determine their capability and performance in removing the offensive fumes. Critical parameters analyzed included the proper balance of flow rate, backpressure and gas residence time, and part geometry to accommodate the existing mixing chamber housing. Removal of gases with activated carbon requires careful evaluation of complex processes involving chemical kinetics in various gas flow patterns. Gases moving too quickly through a porous structure will not have adequate dwell times to react with the carbon. Gases moving too slowly through the porous structure will result in overly high backpressures and low flow-rates. With these principles in mind, Porex developed a custom blend of raw materials including an appropriate activated carbon to meet the design goals of the challenge.

Results

The finished molded solution resembled a disk, incorporating two different outside diameters, which facilitated a simple press fit into the existing mixing chamber. The air filter was designed to maximize airflow rate from the mixing chamber by maximizing the available surface area as well as to increase residence time of the gases by minimizing the nominal pore size. As a result, the Porex air filter solution maximized removal of the offensive gas prior to discharge into the operating room.

By combining ideas, know-how and proven results with the highest standard of innovation and excellence, POREX Porous Media provides unique solutions for various applications.



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