Star-Sep™
advanced filtration technology

Star-Sep™ Ceramic Filters in Pharmaceuticals Industry

GlaxoSmithKline, the pharmaceuticals giant, cut operating costs at its drugs plant in Worthing UK, by replacing polymer with ceramic membranes. The filtration system supplied by Mantec Technical Ceramics comprised 4 banks of 8 housings, each housing containing 108 ceramic membranes. The total installation being 208 m².

The principal of crossflow microfiltration is common in many processing environments and is used in anti-biotic drug production to separate residual matter from a process liquor.

Cells are grown and then mixed with a liquid formula to give the drug its essential ingredients, after which the residual cells need to be extracted. The liquor is re-circulated through porous ceramic tubular membranes, forcing the fluid filtrate through the membrane by virtue of pressure differential whilst the concentrated residual matter continues through the membrane for disposal as a waste by-product. A solvent extraction method is then used to purify the drug.

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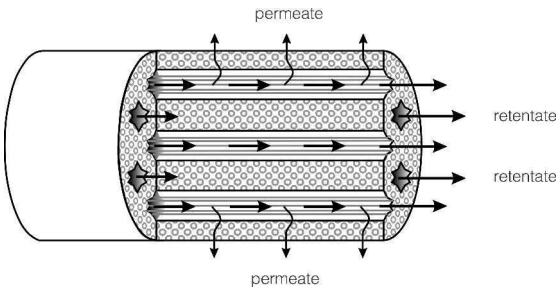
The ceramic membranes offered GlaxoSmithKline several economic advantages over their polymer predecessors – they require less maintenance, are easily cleaned and have a greater life expectancy. But the most significant benefit is in energy savings. Crossflow microfiltration is necessarily energy-intensive. In order to achieve the required crossflow velocity, a high crossflow volume is required and hence the need for high-powered pumping system that consume a great deal of energy. Mantec's unique membranes, featuring star-shaped flow-channels, drastically reduce the energy required to re-circulate the liquor.

The ceramic membranes' multiple flowpaths are narrow, maximising the surface area and minimising the retentive cross-sectional area. The irregular shape also induces turbulence, the net effect being to reduce the crossflow volume by 50%. This has a direct impact on pump energy input, reducing it by a similar amount. The ceramic media offers superior filtration performance, with double the flux of polymer units, reducing energy input by 50% and bringing a total reduction of 75%. In addition to substantial savings on processing costs, savings can also be made on equipment infrastructure costs, particularly by using smaller pumps and valves. The ceramic membrane module was a critical, yet proportionally low-cost component of GlaxoSmithKline's new anti-biotic drug processing system, enabling a multi-million pound investment to be recouped within just 15 months.



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