Optimized branch flow filtration

Microfluidic filtering system and method

This method delivers clog-free continuous flow microfiltration using laminar flow. In contrast to previously published work in this area, this device and method gives identical size cutoffs at many sequential branches while maintaining a small dead volume. This means higher flow rates and a sharp filter cut-off size. The device is a potential competitor to membrane microfiltration of particles from 0.2 to 20 microns at less than 50% solids.

The innovation uses a small and variable volume collection channel to connect fluid from a dense array of branches. Such a geometry allows an iterative machine design process to deliver desired branch flow rates and filtration sizes.

The diagram above illustrates an example 3D solution. Fluid enters at left, and filtered fluid enters the branches and is gathered in the collection channel. Concentrated large particles exit at bottom right. The innovative device and method allows for many more branches and smaller filtration sizes. (Inset: The fractionation principle, in which large particles are prevented from entering the branch is illustrated).

Key benefits

- Small variable volume collection channel
- Nano separation with micro features
- Non-clogging, and therefore suitable for industrial processes
- Designed for arbitrary manufacturing tolerance
- Branch channels that are at minimal spacing for minimum device area
- One input, two outputs
Applications

- BioTech: separations technology
- Clean technology: fluid management technology
- Pharmaceutical: drug discovery & development

IP Status – patent information (if applicable)

“Microfluidic filtering system and method” patent application has been filed in Australia No. 2012904338.

Commercial opportunity

This technology is available as an Easy Access licence deal to companies and individuals, on a non-exclusive basis.

Find out more

For more information on this technology, please contact Warren Bailey warren.bailey@mq.edu.au