

## **INTELLIGENT FLUID FILTRATION MANAGEMENT SYSTEMS**

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Filtration is one of the oldest separation technologies, and in the 21st century, the technology is probably the only separation process that touches every human life every day in some form. Today, the world market for fluid filters is growing at a 5.6% cumulative growth rate, with an expected annual revenue of 46 Billion in 2020.

Most of today's filters are made of synthetic polymers (sheets, beads, or fibres), with a smaller percentage made of metals, natural media, and ceramics. Most filter cartridges, modules, and spent media are either non-biodegradable or cannot be recycled efficiently. With the limited life of filters and frequent replacement of these cartridges, with no systematic and efficient recycle option for the spent cartridges, we need to re-evaluate the true life-cycle cost of deploying filtration in today's world.

In this presentation, we will review typical cradle to grave journeys of filters, focusing on polymeric membrane filters used for water purification and process separation. This will be used to address one question – can efficient and responsive cleaning of these filters lead to improved life cycle costs of these filters? In this context, we will discuss how improved materials combined with intelligent and adaptive cleaning can improve operational efficiency, lower filtration energy costs, and extend the life of a single generation of filters, leading to better life cycle value of these products for the end user. We will next review if extending the life of the cartridge or media indeed results in shrinking business for the filtration component manufacturer or supplier, or if it poses an opportunity for evolution of an innovative business relationship in the filtration market.