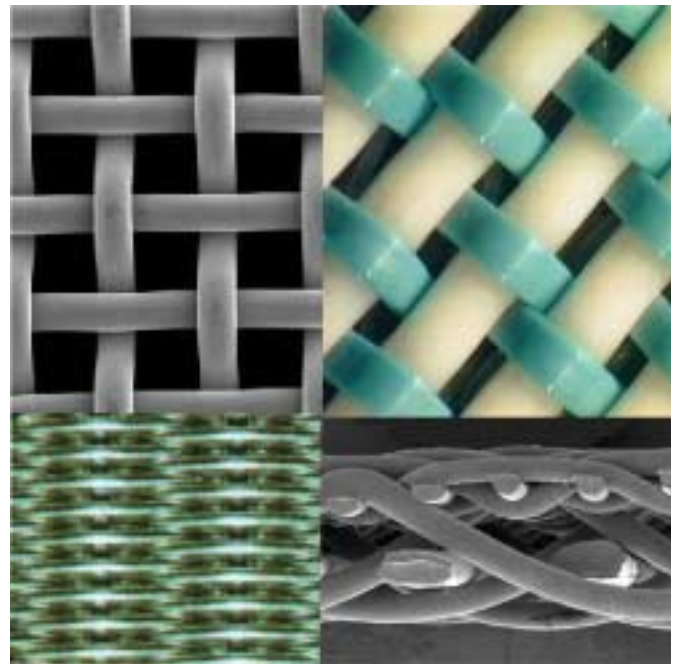


# The Filtration Society – providing an unparalleled resource in filtration and separation technology



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**T**he treatment of waste water has had a profound effect on almost every industry in the last 20 years. Initially, it was viewed as an additional burden on companies already struggling to make a profit, however with careful management and the application of the latest technologies, the old adage 'where there's muck, there's brass' can really be true. There have been several cases recently where the treatment of waste water can yield a product as valuable as the primary product in the production line.



*A selection of woven filter media*

This was exemplified in a paper given at a recent symposium arranged by the Filtration Society. In the production of cheese only 10% of the milk is actually used for cheese, the remaining whey is essentially waste. Hitherto, the whey residue was simply washed away to drain but such a practice is now prohibited. The cost of tankering away the waste is prohibitively expensive, while installing on-site evaporation equipment is expensive both in capital and running costs. Such costs could not be factored in without a significant increase the price of the cheese.

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Instead, commercial microfiltration systems<sup>1</sup> have been installed, which recover the very low concentrations of fats, proteins and lactose. These high value products have been modified to produce infant formula milk much closer to in composition and functionality to human milk, which represents an \$8-10 billion global industry. Other high growth, high margin products using isolated whey proteins include fermented products such as the new range of flavoured beverages, probiotic yohhurts and yoghurts. So the combined influences of waste disposal legislation and filtration advances, rather than depress the market, may yet turn it on its head whereby the primary product is not the cheese itself but the high value added by-products.

A similar success story was recently reported<sup>2</sup> entitled 'There's gold in them there drains!' Elemental analysis of roadside drains, particularly those on roundabouts showed a higher concentration of platinum group metals than in many commercial mines. Similar high yields were also discovered in waste incinerator ash. The next major technological push is to try to commercially recover these valuable products. The benefit to the environment goes without saying.



*A NIRO Microfiltration Unit for ultrafine particle reclamation*

The Filtration Society, being a wholly independent organisation, is ideally placed to bring together all parties, from the legislators to the manufacturers and end users. One very popular seminar was 'Pollution Control and Effluent Treatment – New Legislation and Technical Solutions', where an informative lecture from the Department of the Environment showed how close collaboration with industry, rather than being burdensome can ultimately be very cost effective, either in optimising equipment selection and/or increasing the recovery of useful product.

An example cited was the production of wood board products at the Chirk plant, North Wales, one of the largest facilities of its kind in Europe. Wood processing is well known to be one of the biggest users of water of any industry and so waste water treatment is a very sensitive issue in the rural locality. Although the latest legislation forced the re-examination of particulate and chemical contamination, new developments in filtration technology not only solved the problem but improved the margins by increasing product yield.



*Whitehouse Scientific's Submicron Filter Calibration Standards*

Environmental legislation was also the driving force in developing new filter media for the textile industry. Like the wood pulp industry, the textile industry also relies heavily on the use of large volumes of washing water. It was for this reason that the industrial revolution expressed in the form of textiles was birthed in the North West region of England. There was an ample supply of raw material – sheep, and water to provide both the energy to drive the looms and wash the fleeces.

Typically, it takes over 100 litres of water to process just 1kg of textile material<sup>3</sup>. Not only must the washing water be treated to recover important by-products such as lanolin, but bleaching and dyeing chemicals must also be removed before discharge back to the water courses. Coagulation and

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flocculation processes are used to precipitate the contaminants into large enough coagulants that can then be filtered out using new filter media having pore sizes below 2 microns. The purified water can then be recycled back to the front end of the process<sup>4</sup>.

The advances in filter media design have not only solved an effluent discharge problem but have also decreased the water dependency by increasing the recycling efficiency. An unlikely beneficiary is the cashmere industry of Mongolia where there is a much more limited supply of water.

A review of the latest developments in filter media design takes place every two years under the auspices of the Filtration Society, another event that is very well attended.

The most popular of all the Filtration Society symposia however are those relating to pore size measurement, validation and testing of filter media. Last years event, which celebrated the 40<sup>th</sup> anniversary of the Society attracted over 100 delegates from 10 countries.

The pore size measurement of filter media is obviously a fundamental parameter as it determines the ability of a filter to trap particulates. There are two quite separate approaches, firstly bubble point testing where the air flow rates through a wetted filter can be theoretically related to the pore size distribution as the blocked pores are blown free (known as Potometry) and, secondly, the challenge test method where particulates are presented to the filter and the particle size downstream of the filter compared to that of the particles presented to the filter. An obvious advantage of the latter is that it is an absolute method involving real (and traceable) particles, however, unlike Potometry it is a destructive test as discs of the filter media have to be cut for analysis.

In any evaluation of filter media, pore size measurement has to be the initial test as it determines the clarification ability of that filter. Thereafter, other parameters such as dirt holding capacity, mechanical strength, inertness and product release have to be considered.

The Filtration Society is a unique organisation that addresses all technical issues relating to filtration and separation. Through its quarterly publication FILTRATION and the symposium notes, it provides an unparalleled resource to both manufacturers and users alike.

*For further information visit: [www.filtsoc.com](http://www.filtsoc.com)*

#### References

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