



FILTERING SWIMMING-POOL WATER *with sand filters*

In the field of swimming-pool water treatment, the definition of “sand filtration” can be extremely vague. The term is often used to cover a range of different technologies, from the simplest to the most complex.



You should always remember that “single layer” filtration systems use a filter bed formed by sand alone. Two layer filtration systems on the other hand use a layer of anthracite in addition to that of sand, while Multi-layer filtration systems use a third filter layer made of Garnet. Multi-layer filter beds are also laid over an under-bed of coarse gravel to ensure a good, uniform flow of water during the backwashing phase.

You only need to learn a little bit about water and water treatment, either from laboratory testing or from trials in the field, to be told that Multi-layer systems give far better results than single layer filtration systems. The difference can be seen in various parameters: filtrate quality, investment costs, running costs and ease of maintenance, and consumption of chemical products.

These notions are generally accepted unquestioningly, and we seldom have any opportunity to verify in reality, especially in any useful comparative test situation, what real, measurable differences there actually are between the two technologies in terms of the above mentioned parameters.

At last, however, we have an opportunity to do so, and the results of the comparison are interesting to say the least.

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So let us go to Coimbra, in Portugal, one of the world's most famous tourist areas.

There are two separate swimming-pools in this resort, one of which is a [half-Olympic size pool](#) of 25 m in length (*photo to the right*), and is served by 2000 mm Ø single layer sand filters from a well known manufacturer who supplies filters with similar characteristics to those of most of our competitors.



The other pool is an [Olympic size pool](#) of 50 m in length (*photo to the left*) and is served by four Culligan Swim HMS 180 Multi-layer Filters.



Environmental conditions are identical for both pools: they use the same water, are maintained by the same technical staff, and have a similar number of users per m².

Our client in Coimbra testifies that there are **major differences** in the management of the two pools. These can be summed up as follows:

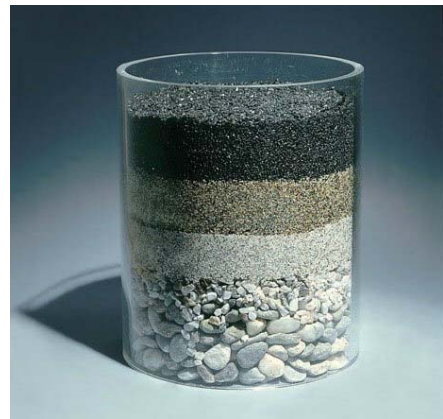
- the Multi-layer Filters produce **far superior water quality**, removing microscopic particles without the need for flocculants;
- the Multi-layer Filters have a **far higher filtration rate** (40-50 m/h), well ahead of the single layer filters that cannot even manage 30 m/h. This means that a smaller diameter Culligan Multi-layer Filter can be used for the same application, with **obvious savings in investment costs**.

The running costs for Multi-layer Filters are significantly lower too. The Multi-layer Filters need backwashing less frequently (once a day compared to twice a day for the single layer filters) because the gradual nature and selectivity of the filtration performed by the multiple layers prevents large particles from blocking the surface.

This in turn means significant savings in the amount of water required for backwashing. And since water used for backwashing has to be heated, this leads to further savings in energy consumption.

The consumption of chemical products is far lower with Multi-layer Filters too, because, as stated above, the need for flocculants is completely eliminated.

The flow controllers incorporated in Culligan Multi-layer Filter systems ensure optimal fluidisation of the filter beds during backwashing and prevent any loss of filter media to the drains.



Aerial view of a Culligan swimming-pool complex in Castiglione della Pescaia in the province of Grosseto

The following tables provide an eloquent summary of the comparison between these two filter technologies.

COMPARISON BETWEEN CULLIGAN MULTI-LAYER FILTERS and SINGLE-LAYER FILTERS

PARAMETER	SAND FILTERS	
	Culligan Multi-layer	Single layer
Filter size	2230 x 2735 mm	2800 x 3340 mm
Daily volume of warm water needed for filter backwashing	16 m ³	48 m ³
Daily cost of warm water needed for filter backwashing	€ 2.00/m ³ x 16 m ³ = € 32.00	€ 2.00/ m ³ x 48 m ³ = € 96.00
Drainage capacity required for backwashing water	120 m ³ /h	180 m ³ /h
Volume of compensation tank (assuming one backwash a day)	38 m ³ less than for single layer filter	38 m ³ more than for Culligan Multi-layer filter
Filter rating in microns	5	30

MONTHLY RUNNING COSTS FOR ONE 180 m³/h FILTER

PARAMETER	SAND FILTERS	
	Culligan Multi-layer	Single layer
Monthly cost of warm water for filter backwashing	€ 32.00/g x 30 days = € 960.00	€ 96.00/g x 30 days = € 2,880.00

Do remember the fact "**ease of operation and maintenance**" is fundamental to the choice of a Culligan Multi-layer Filter. The Coimbra customer has explicitly stated that maintenance work is needed far less often on Culligan's Multi-layer Filters than on the single layer alternatives, and that when maintenance work is required is easier and more effective.

Finally, don't forget that Culligan also stands out for customer service. In addition to our own factories and offices and a national dealers network, Culligan also has Licensed Distributors in 100 countries around the world who provide customers with localized Service Centres, so you are never far from Culligan!