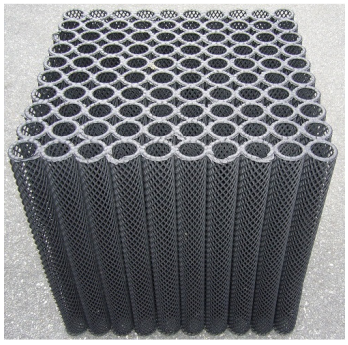
Development of Biofilm

on BIO-BLOK® 150

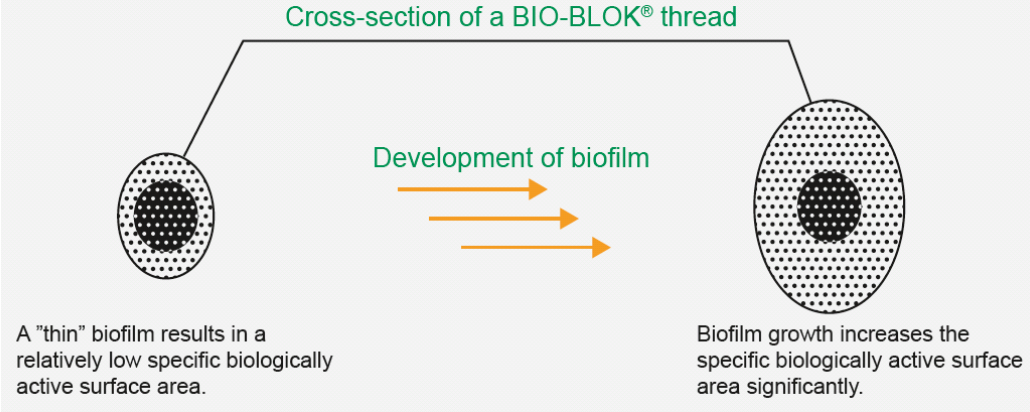
BIO-BLOK® 150 is a block constructed from net tubes welded together top and bottom. Each tube has an outer diameter of approx. 55mm. Each cubic meter of BIO-BLOK® 150 filter media consists of 330 Ø tubes (tubes of one meter length).



BIO-BLOK® 150

Each net tube consists of 32 polyethylene strands with a theoretic diameter of approx. 2.5-3mm. The net strands are welded together so that they form diamond holes in the tube wall. The size of the holes (aperture) is approx. 3.3 x 3.3mm.

These strings give a total area of approx. 150m^2/m^3 in dry condition.



The question is then: What happens when the biofilm grows on the BIO-BLOK® filter media?

BIO-BLOK® 150	Dry condition	150m^2/m^3
BIO-BLOK® 150	1mm biofilm	268m^2/m^3
BIO-BLOK® 150	2mm biofilm	387m^2/m^3
BIO-BLOK® 150	3mm biofilm	507m^2/m^3

With approx. 2-3mm biofilm, the biofilm will start closing the holes in the net tubes.

If the biofilm grows by more than 2-3mm, this is an indication that the filter media is overloaded. If it is a matter of a submerged, aerated system, this can, however, be remedied by means of heavy aeration. If it is a matter of a trickling filter, the hydraulic surface load over the filter can be increased, thus the increased water flow reduces the thickness of the biofilm.

If you imagine that the biofilm is completely smooth on the inner and the outer sides, the minimum surface of the filter media will be approx. 114m^2/m^3.

However, this situation is only theoretic because the two strands that together form the tube wall are approx. 7mm thick. Therefore, as the wall consists of strands with a diameter of approx. 4.5mm, the inner and the outer tube walls will not be smooth; on the contrary, they will be extremely varied in thickness.

In conclusion if the filter media is heavily loaded in a period so that very thick layers of biofilm form on the filter media resulting in “closing” of the holes in the net tubes (the tube wall), then the specific biologically active surface area will be between 114m^2/m^3 and 200m^2/m^3.

Though, in such a situation the filter media will never clog because even though the holes in the tube wall are closed by biofilm, the tubes themselves are still open.

When the filter media is normally loaded again, the old biofilm will fall off and new biofilm will grow so that the specific biologically active surface will increase as described above.

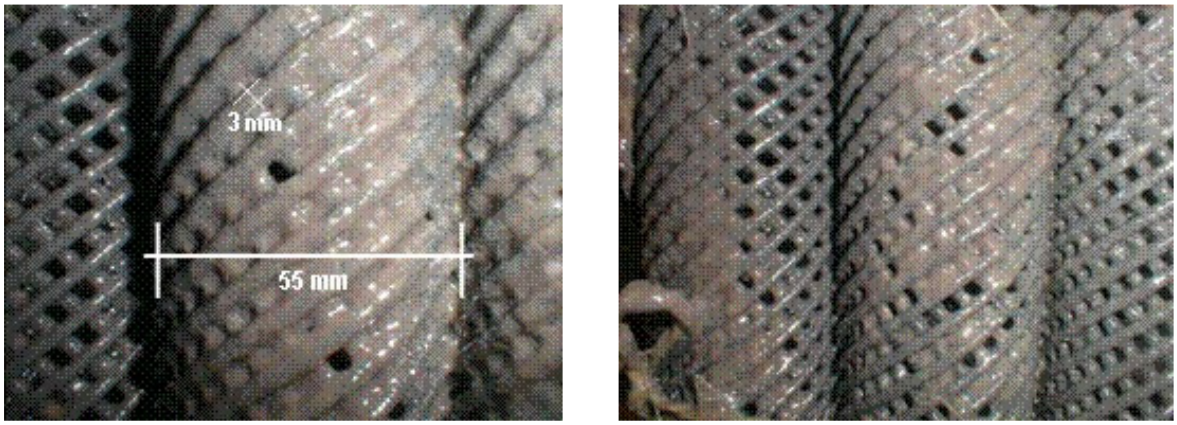
When BIO-BLOK® is used within a trickling filter, the thickness of the biofilm is regulated by increasing the hydraulic surface load on the filter.

Within a submerged, aerated filters, the thickness of the biofilm is regulated by increasing the distribution of air in the filter media.

Based on above observations, it is important to monitor the development of biofilm within your system and to carry out routine operational checks of the wastewater treatment plant. This means that operation of the filter media will always be optimised.

Doing so, the biological wastewater treatment plant can decompose the overloads that always occur in a wastewater treatment plant because the capacity of the biological filter, in periods, can decompose 2-300% more than assumed.

This in addition to the many other features of BIO-BLOK® is the reason why wastewater treatment plants constructed with BIO-BLOK® filter media always have a good and stable operational process.



Biofilm developed on the surface of a BIO-BLOK® media

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