

# IMPROVING PROCESS ECONOMICS FOR SRP MEMBRANE PROTECTION



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**FIRST CLASS SERVICE  
 WORLD CLASS FILTERS**  
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## INTRODUCTION

The continuous supply of treated seawater is essential for the economic operation of a platform or FPSO. Prefiltration to membranes in processes such as sulphate reduction play a key role.

The in-service life of a prefilter is directly related to the inlet water conditions and these can vary considerably with geographical areas, seasons, and with the local weather.

While the filters purpose is to remove suspended solids at the stated micron rating, the service life of the filters is limited by biological fouling and growth, including algae. This can significantly reduce run times and increase downtime and cost.

Changing intake depth and optimising pre-treatment are vital to reducing the biological burden on the filter however this remains the dominant fouling mechanism and therefore dictates cartridge life.

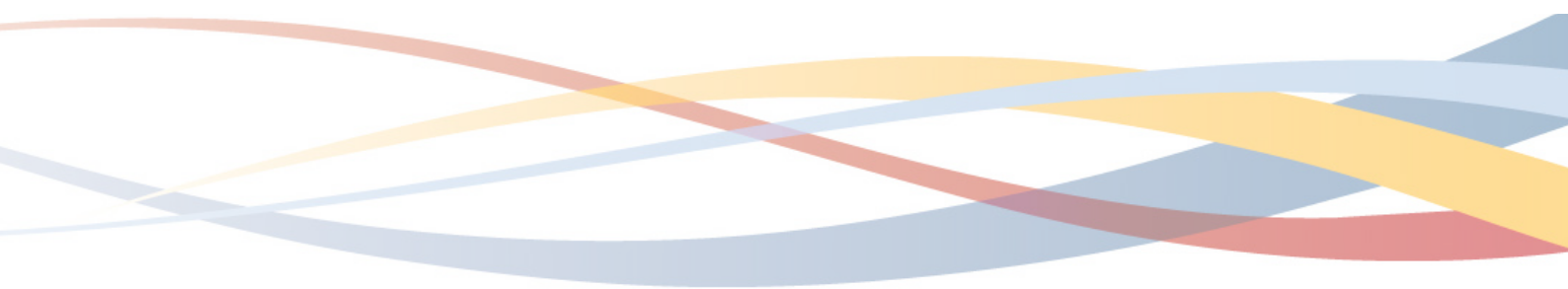
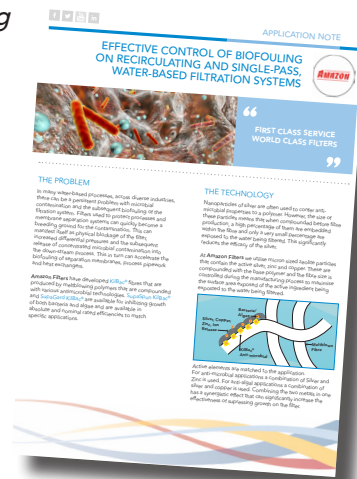
So, if we cannot eliminate this in practice, what can we do to minimise the effect on the filter and keep the processes going?

## PREVENTING MICROBIAL AND ALGAL GROWTH ON THE FILTER

Extensive laboratory testing has been performed on the **SupaSpun KilBac®** demonstrating the effectiveness of both the antimicrobial and anti-algal filtration media on supressing growth of captured organic material. This is discussed in detail in supplementary application note: **'Effective control of biofouling on recirculating and single pass, water based filtration systems'**.

The real question is, can this benefit demonstrated in a lab, be translated to a measurable and significant difference to the filters performance in real world conditions.

Due to the varying and often rapidly changing conditions of inlet seawater it is difficult, if not impossible, to obtain definitive comparison testing when running different filters back to back as filter run times are not constant even with identical sets of cartridges. To address this issue, a test program was initiated that ensured that the three different specification filters tested were challenged with the same quality sea water.



## TEST DETAILS

The test housing used was one of a bank installed in parallel downstream of multi media beds, delivering prefiltered sea water to a membrane sulphate reduction stage on an offshore production facility. The test housing was installed with a mixture of the following filters which were all exposed to the same particulate and biological challenge:

- 5 micron anti-algal **SupaSpun KilBac®**
- 5 micron antibacterial **SupaSpun KilBac®**
- 5 micron untreated standard **SupaSpun II** filter

The test was run as part of the normal operation of the facility and after being changed out on high differential pressure as per normal the cartridges were returned to Amazon Filters laboratory for further analysis.

## TEST RESULTS

The main criteria for success is demonstrating decreased blocking and therefore increased service life using the **KilBac®** variants.

The **KilBac®** additive does not significantly change the physical behaviour of the filter cartridges, and unused samples of all cartridge types returned identical DP / flow and solids loading characteristics, therefore comparing these characteristics in the used filters will indicate any differences in fouling.

Samples of all three of the used variants were flow tested with water, followed by a dirt holding capacity test using ISO test dust – the results are averaged and presented below.

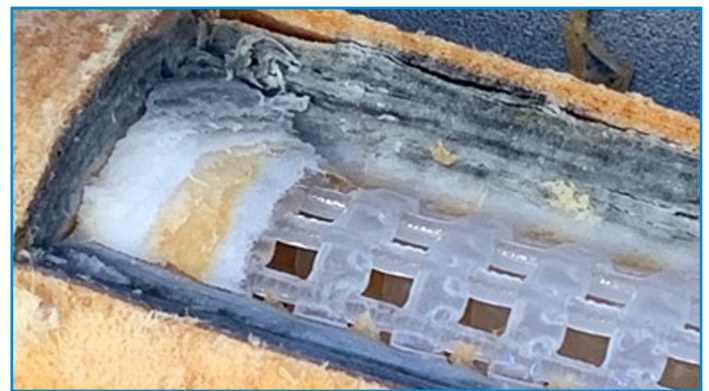
	SupaSpun PP	KilBac® AP (Anti Algal)	KilBac® BP (Anti Microbial)
Differential Pressure (bar)	0.5	0.27	0.28
Dirt Holding Capacity (g)	29	40	65

The results show the **KilBac®** variants exhibit half the differential pressure of the standard filters. The **KilBac®** variants also demonstrate 39% and 125% increase in the dirt holding compared to standard **SupaSpun**. This strongly indicates that using these variants in service will significantly increase cartridge life, reduce downtime, and deliver cost savings.

## DISCUSSION & CONCLUSION

The purpose of the **KilBac®** variant is to arrest the growth of organic material captured on the filters. Dissection of a standard **SupaSpun** filter (see image) clearly shows the removal of larger inorganic material on the outer layer of the filter with the organic material being captured further through the depth of media. The level of inorganic material captured on the **KilBac®** variants was the same as those of the standard **SupaSpun**. This demonstrates clearly that the additional differential pressure observed on the standard **SupaSpun** is purely down to the proliferation of microbial / algal growth.

These results provide compelling evidence that the use of **KilBac®** variant filters in seawater filtration systems can more than double service life of the prefiltration stage.



## KEY BENEFITS OF USING THE KilBac® VARIANTS

1. Doubling of service life with an accompanying reduction in annual filter spend.
2. Greater protection of the downstream membranes. If biofouling is allowed to occur on the prefilters this can break through and foul the membranes resulting in downtime and the expense of cleaning and regenerating.
3. Reduced number of filter changeouts = reduced operational downtime.
4. Potential for the filter to remain operational in times of increased challenge of organic material due to localised algae blooms.

If you are interested in evaluating the effectiveness of the **SupaSpun KilBac®** on your production platform please contact your local **Amazon Filters Ltd** sales representative or visit:

[www.amazonfilters/oil-and-gasfiltration-solutions](http://www.amazonfilters/oil-and-gasfiltration-solutions) for more information or a 'live chat'.

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