NOVEMBER 2022

NEW RANGE OPTICLEAN™+

Piedmont GENESYS PWT™

DISTRIBUTOR SUMMIT

NOVEMBER 13-17, 2022

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Introduction

A good way to win a customer and keep them over time is to help them solve their problems, with an effective chemical cleaning (autopsies, cleaning studies, etc.).

Many success stories of regular antiscalant sales come as a result of successful cleaning.

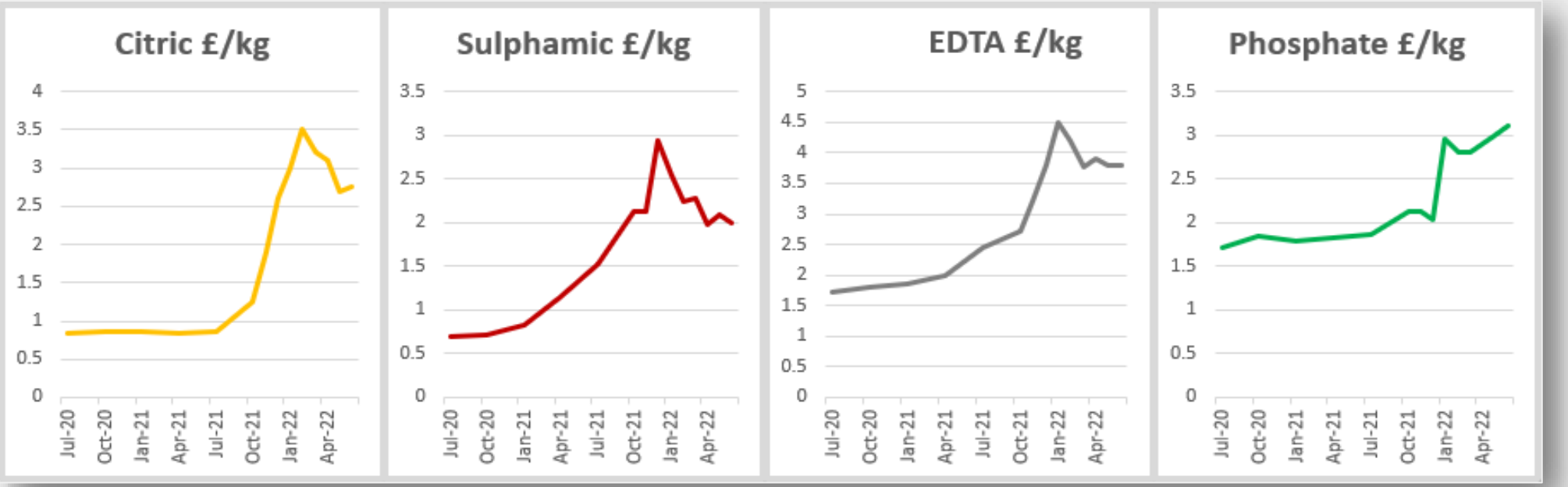
Also, the total confidence of the clients not only in the product but also in the technical service.

We are part of the solution.

Commodity cleaners

Some commodity chemical raw material prices have more than tripled in price since different factors have affected global supply chains

Price increases in Pounds/kg for very basic commodity chemicals that have had stable prices for years.



Specialty Chemicals Factories

PWT Factory (USA)

GENESYS Factory (UK)

Specialty Chemicals Factory (UK)

The growth of the powder cleaners has been beyond our expectations, particularly in large SWRO applications where they are proven to reduce cleaning frequency.

The new facility is NSF approved and have a capacity of >1,000 MT per annum, it also allow us to manufacture a new improved range of PWT Opticlean products.

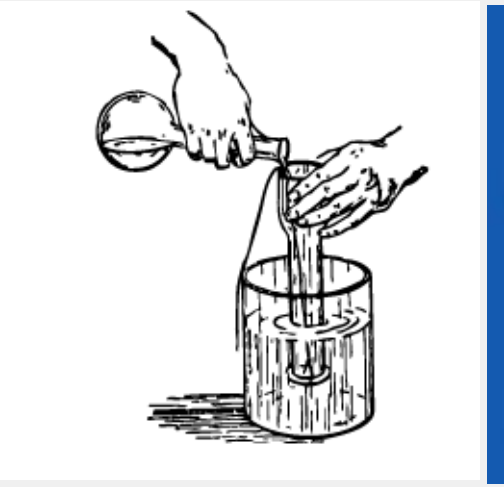
This is an **H2O Innovation** Investment of almost $1,000,000 that represents our commitment as a company to provide the best conditions for our clients.

PWT Powder product range produced in Vista

Product Name	Description	Use
OptiClean A	Powdered acid cleaner	Scale, metal hydroxide
OptiClean B	Powdered alkaline cleaner	Organic, Biological, Particulate matter
OptiClean C	Powdered neutral pH cleaner	CA membranes – silt, colloids, acid insoluble
OptiClean D	Powdered acid cleaner	Iron, manganese
OptiClean G	Powdered alkaline cleaner	Organic, Biological, Particulate matter
OptiClean N	Powdered Neutral Cleaner	Organic, Biological, Particulate matter
OptiClean S	Powdered acid cleaner	Silica (can be used in conjunction with OptiClean A)

Opticlean Re-formulation

The OptiClean™ powder cleaner formulations were re-evaluated due to some currently being **classified as hazardous** for transport and **too expensive** to make in Vista.



Expensive transport and that it was not possible to **ship them together**, or by **air for an emergency**, were the main drivers.

OptiClean™+ powder membrane cleaners, which include "low" and "high" pH formulations, have been reformulated to be non hazardous for easy shipment. The new cleaners retain their cleaning strength and are highly effective in remove inorganic and organic foulants.

OptiClean™+ range is manufactured in UK.

OPTICLEAN™ A+ (Acid cleaner)

OptiClean A™+ is an acidic membrane cleaning formulation intended for the removal of inorganic foulants from membrane systems.

- ✓ This new formulation features chelants, solubilizing agents combined with high ionic solution strength to help lift and remove metal hydroxides, carbonates, phosphates and other similar scales for the membrane surface
- ✓ Buffered pH to maintain optimum cleaning performance throughout cleaning cycle.
- ✓ Nonhazardous formulation provides safer handling.
- ✓ Best results when used in with OptiClean™ B+

OPTICLEAN™ A+
APPEARANCE White powder
PH (2% SOLUTION) 2.50 - 3.50
NSF Certified to NSF/ANSI/CAN 60

Classified for use in membrane systems producing drinking water (ANSI/NSF/CAN Standard 60)

OPTICLEAN B™+ (Alkaline cleaner)

OptiClean™ B+ is ideal for removing organic, biological, and particulate matter from all common water treatment membranes. OptiClean™ B+ now features a high ionic solution strength, creating an osmotic effect that pulls permeate back through the membrane lifting deposits from the membrane surface to enhance the cleaning action.

OPTICLEAN™ B+
APPEARANCE White powder
PH (2% SOLUTION) 10.50 - 12.50
NSF Certified to NSF/ANSI/CAN 60

- ✓ Highly effective against organic and biological foulants.
- ✓ Buffered pH to maintain optimum cleaning performance throughout cleaning cycle.
- ✓ Best results when used in with **OptiClean™ A+**

Classified for use in membrane systems producing drinking water (ANSI/NSF/CAN Standard 60)

h2o innovation®

OPTICLEAN G™+ (Alkaline cleaner)

OptiClean™ G™+ is a high pH (alkaline) powdered cleaner ideal for removing organic, biological, and particulate matter from all common water treatment membranes. Ideal for periodic maintenance cleans, well water, and other light loading applications. OptiClean™+ now features a high ionic solution strength, creating an osmotic effect that pulls permeate back through the membrane lifting deposits from the membrane surface to enhance the cleaning action.

- ✓ Formulated to dissolve organic precipitants from the membrane surface.
- ✓ Buffered pH to maintain optimum cleaning performance throughout cleaning cycle.

OPTICLEAN™ G+
APPEARANCE White powder
PH (2% SOLUTION) 9.00 - 10.00
NSF Certified to NSF/ANSI/CAN 60

Classified for use in membrane systems producing drinking water (ANSI/NSF/CAN Standard 60)

OPTICLEAN N™+ (Neutral cleaner)

OptiClean™ N™+ is a near neutral pH, enzyme activated powdered cleaner ideal for removing organic, biological, and particulate matter. Provides cleaning at milder pH conditions and is ideal for membrane systems troubled by high organic and/or biological loading.

OPTICLEAN™ N+
APPEARANCE White powder
PH (1% SOLUTION) 8.00 - 9.00
NSF Certified to NSF/ANSI/CAN 60

- ✓ Enzymes are biodegradable and environmentally friendly chemical alternatives.
- ✓ Cleaning at moderate pH improves membrane longevity.
- ✓ Buffered pH to maintain optimum cleaning performance throughout cleaning cycle.
- ✓ Cleaning of membrane systems with OptiClean N+ is more efficient when the cleaning solution is heated. The maximum temperature to be used in the cleaning operation is 35°C, or as advised by the membrane manufacturer.

Classified for use in membrane systems producing drinking water (ANSI/NSF/CAN Standard 60)

Preparation of cleaning solution

For the Alkaline products:

OP B+,OPN+,OPG+

The product is a powdered alkaline blend **classified as corrosive** and operators shall wear adequate protective clothing to prevent skin or eye contact and inhalation of dust.

For the Acid product:

OP A+

The product is a powdered acidic blend **classified as an irritant** and operators shall wear adequate protective clothing to prevent skin or eye contact and inhalation of dust.

Reagents for the chemical cleaning shall be made up to the required solution volume in the clean in place tank with due regard to health and safety procedure.

The transfer of concentrated product shall be carried out in a bunded area to prevent spillage to surface drains

Laboratory Test - Results

Case 1: Organics and Al-silicates and Fe Fouled membrane

Product and conditions	Flux rate (LMH) 25°C Characterization conditions:225 psi, 2000 mg/l NaCL 1000 ml/min		% Salt Rejection	
	Before Clean	After Clean	Before Clean	After Clean
1% DP- Opticlean G™ Temp 30-35°C - pH 11.2	22.8	33.0 (+45%)	97.6	97.5
2% DP- **Opticlean G™+** Temp 30-35°C - pH 9.5	23.7	35.9 (+51%)	98.1	98.2
1% DP- Opticlean B™ Temp 30-35°C - pH 11.3	24.8	43.1 (+73%)	98.3	98.1
2% DP- **Opticlean B™+** Temp 30-35°C - pH 11.1	22.8	44.7 (+96%)	97.9	97.8

Case 1: Organics and Al-silicates and Fe Fouled membrane

Product and conditions	Flux rate (LMH) 25°C		% Salt Rejection	
	Before Clean	After Clean	Before Clean	After Clean
1% DP- Opticlean N™ Temp 30-35°C pH 8.5	22.8	33.0 (+45%)	97.6	97.5
2% DP- **Opticlean N™+** **(+100 ppm Enz)** Temp 30-35°C pH 8.7	23.7	35.9 (+51%)	98.1	98.2

Case 1: Organics and Al-silicates and Fe Fouled membrane

Before cleaning

After 1% Opticlean G After 2% Opticlean G+

After 1% Opticlean B After 2% Opticlean B+

After 1% Opticlean N After 2% Opticlean N+

Case 2: Iron and manganese with some organics

Product and conditions	Flux rate (LMH) 25C		% Salt Rejection	
	Before Clean	After Clean	Before Clean	After Clean
1% DP- Opticlean A™ Temp 30-35ºC pH 2.8	13.9	16.6 (+20%)	95.9	96.1
2% DP- **Opticlean A™+** Temp 30-35ºC pH 2.6	12.9	15.4 (+19%)	96.9	97.5

Case 2: Iron and manganese with some organics

Fouled FT SW30 Membrane Cleaning Test Photos

Before clean

After 1% DP-Opt A clean

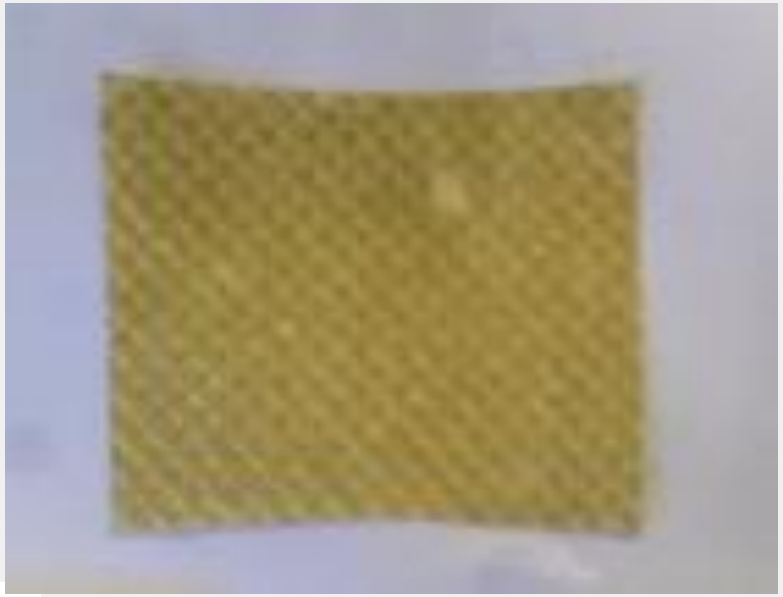
After 2% DP-Opt A+ clean

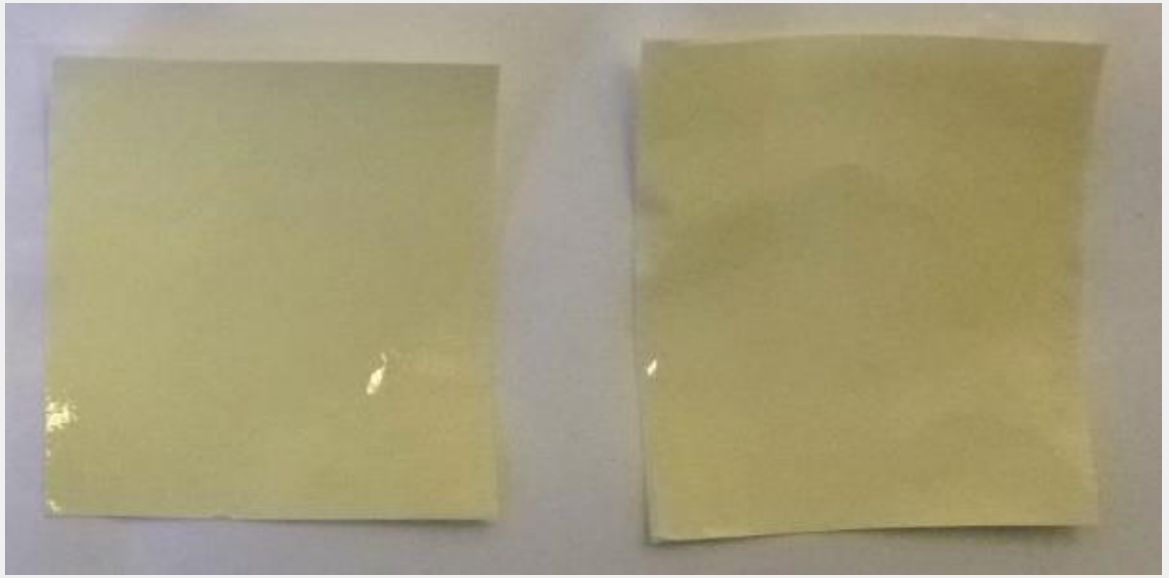
Case 2: Iron and manganese with some organics

Beaker Soak Tests: Fe/Mn Fouled FT SW30 Membrane

Following the successful Flat sheet cleans with this fouled membrane, it was decided to try beaker soak tests each at 1% cleaner concentration (Opt A and Opt A+) over a shorter cleaning time intervals of 0.5, 1 and 2 hours at 20-25ºC

Beaker soak test after 0.5-hour soak



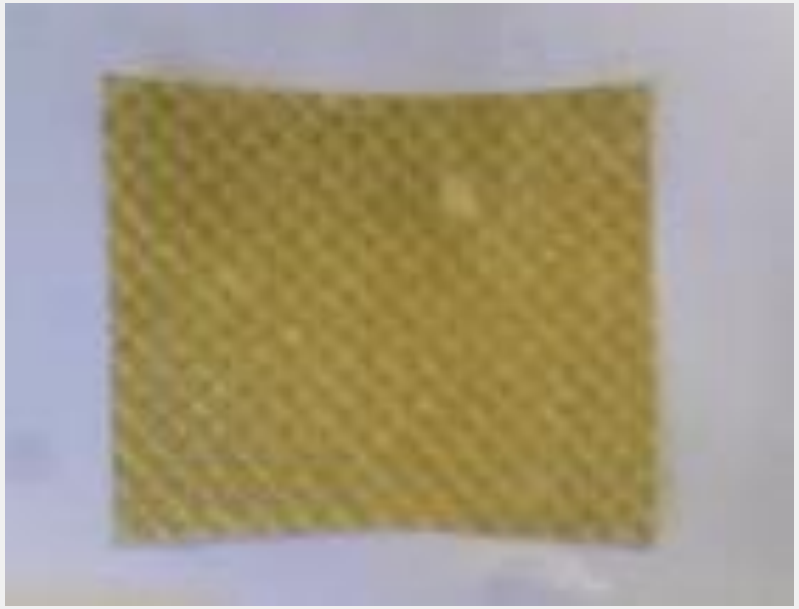


1% Opticlean A

1% Opticlean A+

Case 2: Iron and manganese with some organics

Beaker Soak Tests: Fe/Mn Fouled FT SW30 Membrane

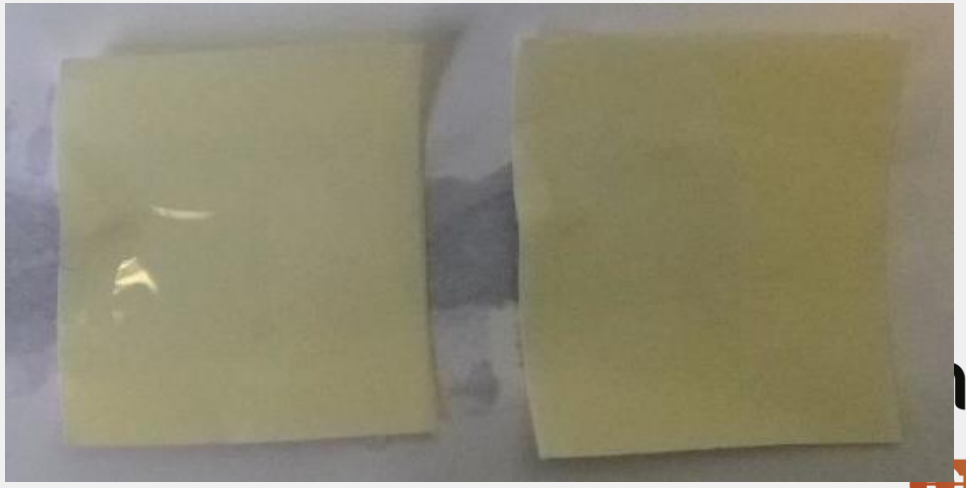


After 1 and 2 hour soaks the cleaners are, more or less, all equally good.

Beaker soak test after 1-hour soak

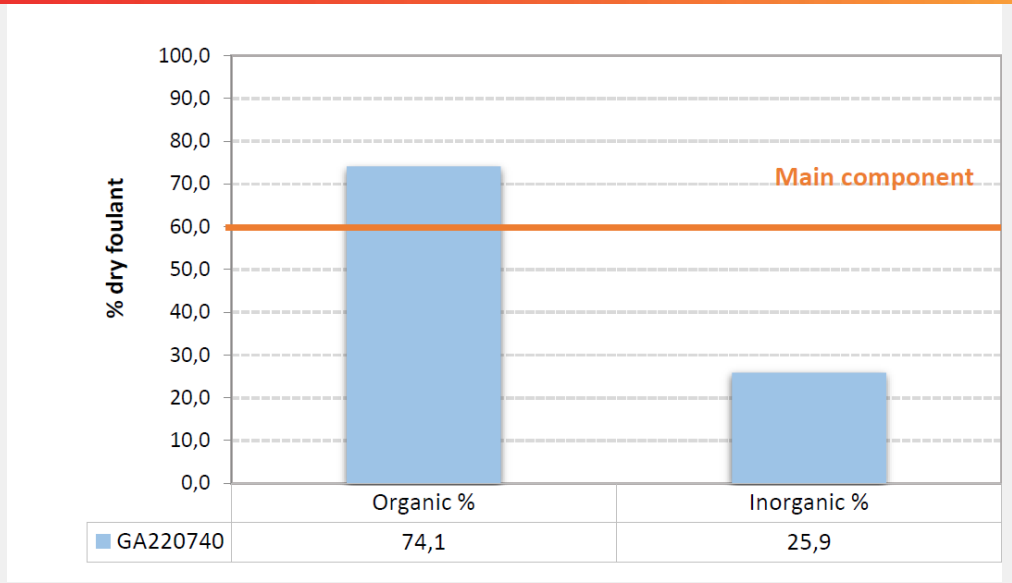
1% Opticlean A 1% Opticlean A+

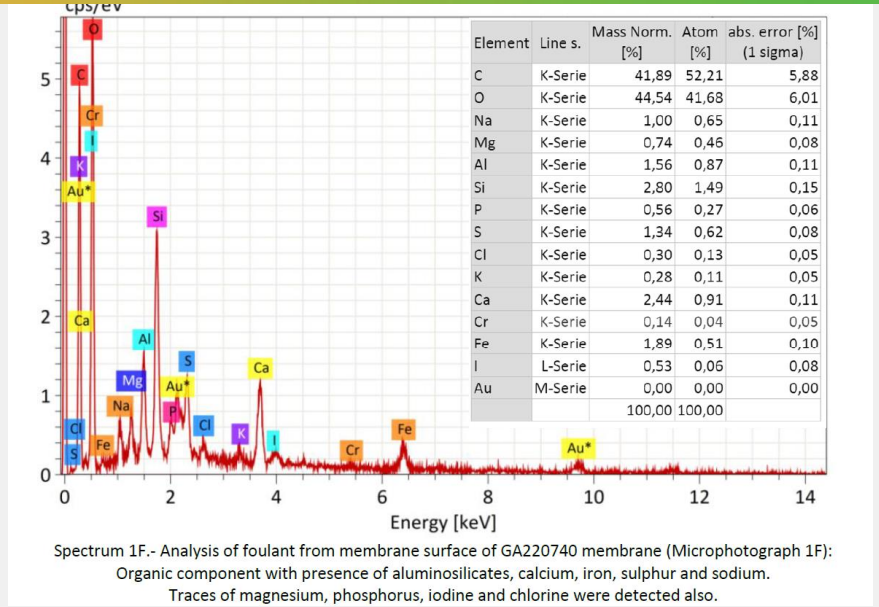
Beaker soak test after 2-hour soak



1% Opticlean A 1% Opticlean A+

Case 3: Organics, Aluminosilicates, Ca, Fe...



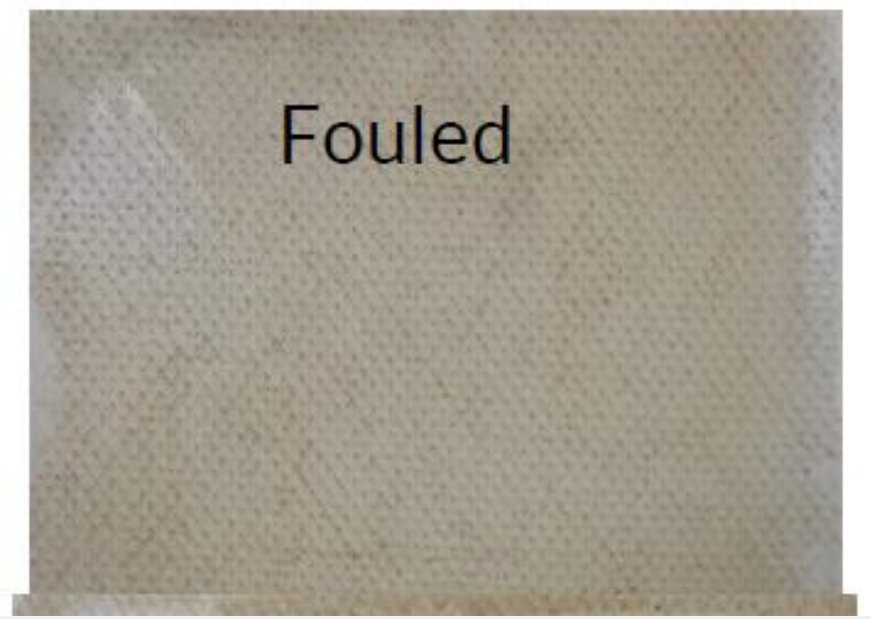


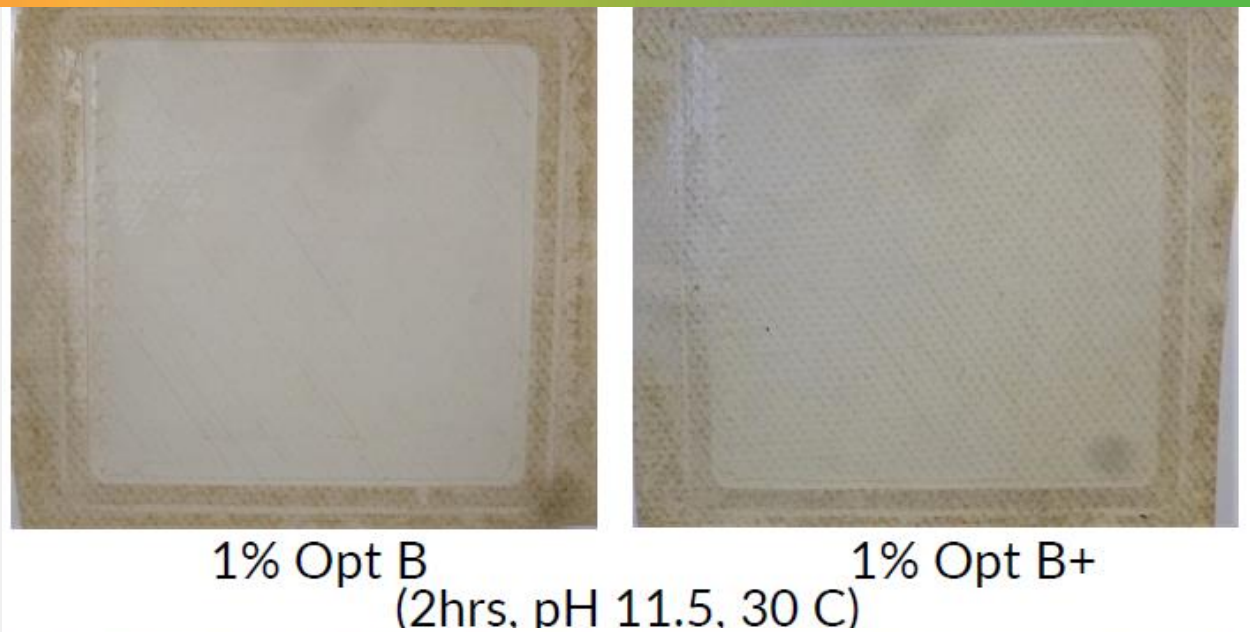
Spectrum 1F.- Analysis of foulant from membrane surface of GA220740 membrane (Microphotograph 1F): Organic component with presence of aluminosilicates, calcium, iron, sulphur and sodium. Traces of magnesium, phosphorus, iodine and chlorine were detected also.

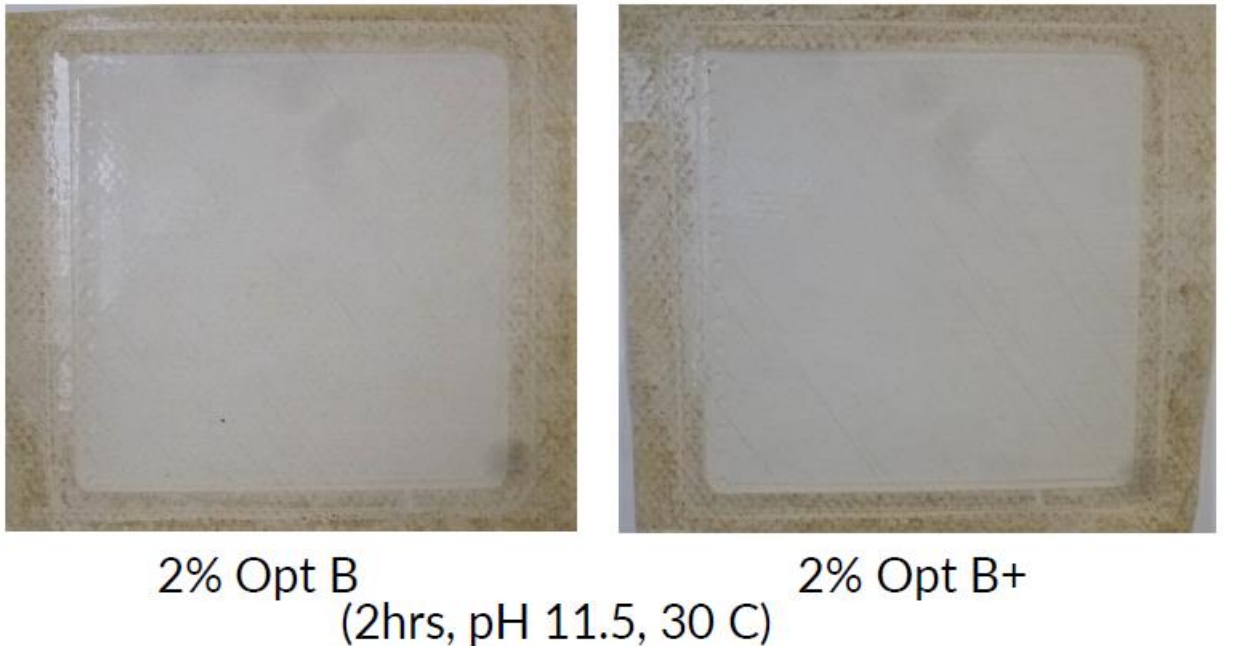
Product and conditions	Flux rate (LMH) 25C		% Salt Rejection	
	Before Clean	After Clean	Before Clean	After Clean
1% Opticlean B™ Temp 35-40ºC pH 11.3	27,08	30.74 (+13,5 %)	98.81	98.79
1% Opticlean B™+ Temp 35-40ºC pH 11.1	29,34	32.40 (+10.4%)	98,63	98.58

Case 4: 49% Organic/ biofouling - 51% Inorganic: Sulphur, aluminosilicates

Testing 1% and 2% Opticlean B and B+

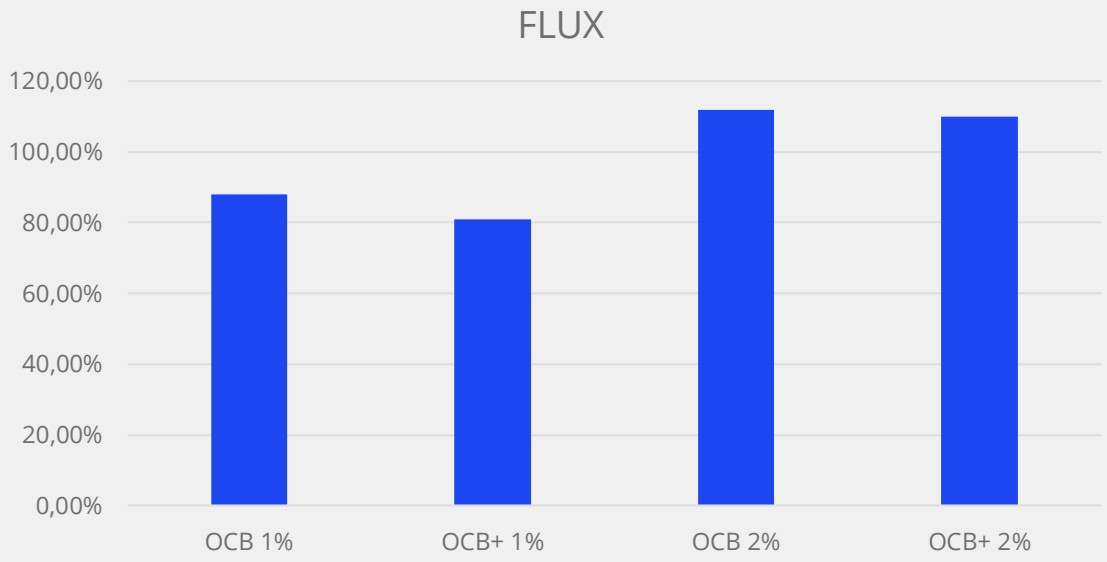






Case 4: 49% Organic/ biofouling - 51% Inorganic: Sulphur, aluminosilicates

	Before clean	After **1%** OCB	%	Before clean	After **2%** OCB	%	Before clean	After **1%** OCB+	%	Before clean	After **2%** OCB+	%
Flux	13.8	26	+88%	11.2	23.7	+112%	11.3	20.5	+81%	10.9	22.9	+110%
SR	84	88	+4.76%	80	96	+20%	88	96	+9.00%	74	96	+29.7%

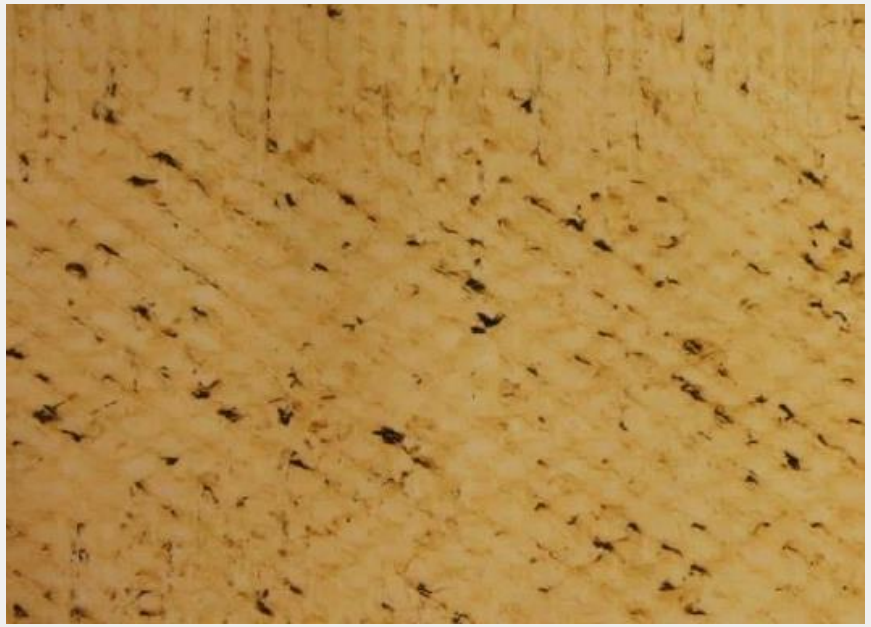


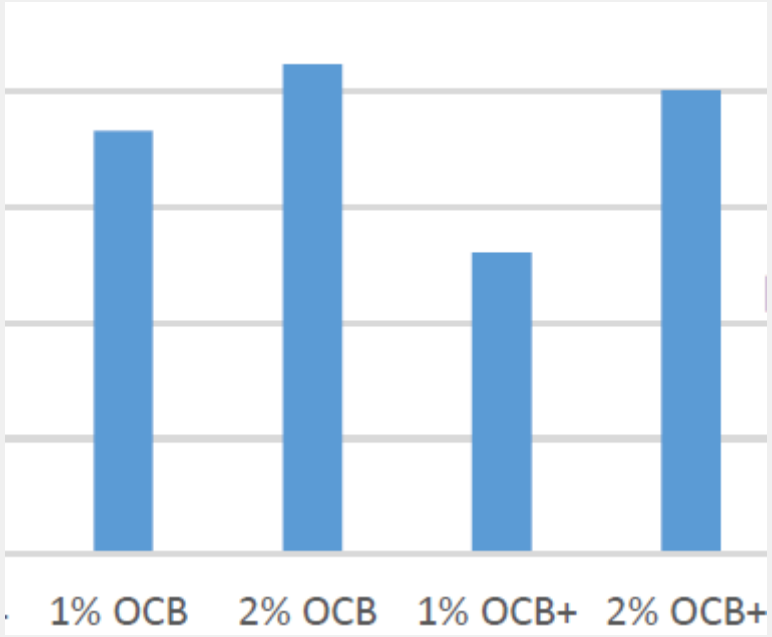
OCB → **Opticlean ™ B**

OCB+→ **Opticlean ™ B+**

Case 5: Aaluminosilicates, iron, calcium and traces of other elements

		Flow rate (l/m²h 25°C)			% Salt Rejection (CE)		
Characterization conditions:225 psi, 2000 mg/l NaCL 1000 ml/min. Cleaning recirculated at 40 psi (2 hours at 35-40°C)		Before	After	%	Before	After	
Clean 1	1% OCB	41.41	56.55	36.6	91.50	85.72	↓
Clean 2	2% OCB	40.62	57.84	42.4	90.54	86.64	↓
Clean 3	1% OCB +	42.97	54,20	26.1	87.48	84.16	↓
Clean 4	2% OCB +	44.73	62.81	40.1	85.59	82.98	↓





General considerations & Tips

For use on **RO, NF, UF, MF** membranes.

Designed for use in an off-line clean-in-place (CIP) process and is to be completely flushed from the system before this is used in the production of water for potable supply.

Recommended dosage → The products are specified for use at 1-2% concentration in the cleaning solution. The maximum dosage of the product in heavily fouled systems shall be no more than 5%.

The products should be circulated and soaked in the membrane system. **Time** is important!

Clean with **Temperature** (35 -40°C)

Max. solution Temperature per membrane manufacturer

EventMobi

1. Is this new OptiClean ™+ range classified as hazardous?
2. Could we ship together OptiClean ™+ (alkaline, acid) and antiscalant?
3. In case of emergency can we send them by air courier?
4. Do all products already have NSF certification?
5. Do you usually buy the OptiClean ™ range from Vista?
6. Do you think you will start buying this new

OptiClean ™+ range?

7. Which alkaline cleaner sounds more interesting for you?

B → OptiClean ™ B+

G → OptiClean ™ G+

N → OptiClean ™ N+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