

Final report

Validation by a dynamic test method of a Fontinet
membrane micro-filter manufactured by Prime Water
bvba of Lommel Belgium

The results of bacterial retention characteristics of
Pseudomonas aeruginosa

Sabine Kreps

Study carried out by order of PRIME WATER bvba

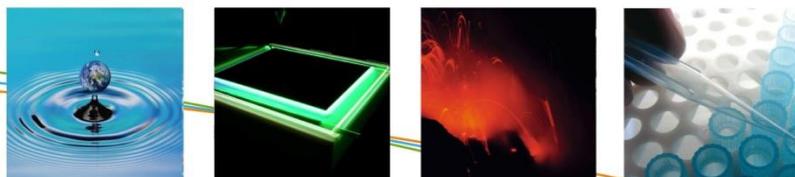


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CHAPTER 1 THE OBJECTIVE OF THE TEST

1.1. OBJECTIVE OF THE TEST

The objective of the test is to determine a > 6 log retention of *Pseudomonas aeruginosa* in a membrane micro-filter as used in the FONTINET “two stage” filter, acc. to ASTM F 838 05 norm, manufactured by Prime Water bvba. The retention was determined over a volume of 1000 liters.

ASTM F838-05 prescribes *Brevundimonas diminuta* as the test organism. As there is no specific selective culture for this organism, it is impossible to differentiate *Brevundimonas diminuta* from other bacteria. Therefore the tests was carried out with a substitute, the *Pseudomonas aeruginosa* bacterium for which a specific culture exists (1).

- (1. Influence of size, shape and flexibility on bacterial passage through micro pore membrane filters. T.Egli – Environmental Science & Technology, 2008, 42, 6749-6754).

1.2. TEST REFERENCE

On behalf of	Prime Water bvba, Lodewijk de Raetstraat 51, 3920 Lommel, Belgium
Filter Id.	Prime Water membrane filtration cartridge (MF8) containing capillary micro-filtration membranes (0.15 µm pore size, 1 mm o.d).
Test organism	<i>Pseudomonas aeruginosa</i> ATCC 15542
Total challenge	1.4E+08
Test period	Beginning of test: 29/04/2014. Conclusion of test: 05/05/2014

CHAPTER 2 TEST DESCRIPTION

2.1. TEST DESCRIPTION

The sampling was carried out in the test laboratory of Prime Water bvba in cooperation with the Reference Laboratory for Microbiology of VITO. The concentrated bacterial challenge stock suspensions, the procedure, the sterile sampling containers, the analyses, supervision and the final test report were delivered by VITO. A professional assistant of Prime Water executed the sampling during the test period.

A cubic container was filled with tap water filtered over a carbon and a micro-filtration cartridge in order to ensure sterility of the test water. The concentrated bacterial suspension obtained from VITO was added during the filling process, in order to obtain a homogeneous dispersion of the bacteria in the container with a final concentration of $\pm 1.4E+08$ CFU per 1000 L.

The bacterial suspension was consecutively pumped through the filter at 2-3 bar. After an initial sample of the unfiltered water, samples from the filter were taken in 5 L bottles after 100 L, 500 L and 900 L had passed.

2.2. RESULTS

After a simulated service life of 1000 L, the CFU retention of the faucet filter was calculated by analysis of the 5 L permeate samples at the beginning, middle and the end of filtration.

faucet filter	after 100 L	input from container	Log reduction
	cfu/5 L filtraat		
	4	1E+07	2E+07
faucet filter	after 500 L	input from container	Log reduction
	cfu/5 L filtraat		
	3	7E+07	1.2E+08
faucet filter	after 900 L	input from container	Log reduction
	cfu/5 L filtraat		
	0	1.3E+08	1.3E+08

The calculation of the retention by analysis of the 5 L permeate samples at the beginning, middle and the end of filtration for the Faucet filter

CHAPTER 3 CONCLUSION

It can be concluded that the membrane micro-filter as used in the FONTINET “two stage” filter, manufactured by Prime Water bvba, effectively stops bacteria in the inflowing water and demonstrates a log reduction of at least 6 (99,9999%). The criteria of the ASTM F 838-05, determining bacterial retention of membrane filters, are herewith satisfied.

Mol, 5 May 2014

A handwritten signature in black ink, reading "S. Kreps.", with a horizontal line underneath.

Ing. Sabine Kreps
Researcher
Reference laboratory for Microbiology
VITO