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## **Analytical Report – Client project – Fairey Industrial Ceramics.**

### **Ref: Job 1402614 – Sterasyl candle**

#### Objective

ALS Environmental Laboratories Ltd were asked to perform a study to assess the performance capability of Sterasyl filters to remove *E.coli* from a contaminated water supply. The filters were supplied by Fairey Industrial Ceramics Ltd (FICL) trading as Doulton Water Filters. One Sterasyl candle was taken from FICL stock and tested.

#### Protocol

A test rig was supplied by FICL for the study, which is fitted with a pump, time switches, rotameters, filter housings and a reservoir tank. The filter was fitted into a filter housing on the test rig and the reservoir on the rig was filled with dechlorinated mains water at ambient temperature.

The TOC and Turbidity measurements of the mains water at the start of the test were recorded as 3.6 mg/L and <1.40 NTU respectively.

The water was spiked with *E.coli* at a minimum concentration of  $1 \times 10^6$  cfu/100mls using washed cell organisms prepared by ALS. Once prepared, the challenge water was pumped through the filter at a rate of 2 l/min, using a cycle of 2 minutes on and 2 minutes off throughout the day to achieve a passage of 100 litres of test water through the candle.

Samples of water post filtration were collected from the waste water stream from the filter daily. One sample of influent challenge water was also collected simultaneously from a sample point immediately upstream of the filter candles. The samples were collected aseptically into sterile containers.



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The samples were analysed to enumerate the *E-coli* challenge organism using the membrane filtration technique ref BP50.15 and reported to FICL as soon as they became available.

The study was run for a period of twelve days; with the filter being challenged for 5 days, rested for two then challenged for a further 5 days. This was equivalent to the total passage of 1000 Litres through each filter candle.

### Results

The daily influent challenges and effluent *E-coli* counts are shown in Table 1 and the *E-coli* filtration efficiency and log reduction of the Sterasyl candle are tabulated in Table 2.

Table 1

	Influent (cfu/100ml)	<u>Sterasyl Candle</u> Effluent (cfu/100ml) ALS sample 16178858
Day 1	1.3x10 <sup>6</sup>	<1
Day 2	2.1x10 <sup>6</sup>	<1
Day 3	1.9x10 <sup>6</sup>	<1
Day 4	1x10 <sup>6</sup>	<1
Day 5	3.5x10 <sup>6</sup>	<1
Day 6		
Day 7		
Day 8	1.5x10 <sup>6</sup>	<1
Day 9	1x10 <sup>6</sup>	<1
Day 10	2x10 <sup>6</sup>	<1
Day 11	2.2x10 <sup>6</sup>	<1
Day 12	3x10 <sup>6</sup>	<1



Table 2

	<b><u>Sterasyll Candle</u></b> % Filtration Efficiency	<b><u>Sterasyll Candle</u></b> Log Reduction
Day 1	>99.99992	>6
Day 2	>99.99995	>6
Day 3	>99.99995	>6
Day 4	>99.99999	>6
Day 5	>99.99997	>6
Day 6		
Day 7		
Day 8	>99.99993	>6
Day 9	>99.99999	>6
Day 10	>99.99995	>6
Day 11	>99.99995	>6
Day 12	>99.99997	>6

**Discussion**

The FICL manufactured Sterasyll candle achieved >99.9999% (at least 6 log) removal efficiency throughout the 12 day test run (equivalent to 1000 Litres of filtration).



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