ALcontrol Laboratories

ALcontrol Laboratories
Unit 7&8 Aspen Court
Bessemer Way
Templeborough
Rotherham
S60 1FB
Tel 01709 369699

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**Analytical Report – Client project 2011/3**

## Objective

ALcontrol Laboratories were asked to perform a study to assess the performance capability of a Doulton Sterasyl candle to remove *E.coli* from a contaminated water supply. The filters tested were supplied by Fairey Industrial Ceramics (FICL). The Doulton Sterasyl candle tested was selected by ALcontrol from 3 filters taken from FICL stock.

## 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 filters were fitted into filter housings on the test rig and the reservoir tank was filled with dechlorinated mains water maintained at 20°C +/- 2°C and dosed to approximately 2mg/l TOC. The turbidity of the mains water was also monitored during testing. When the required water conditions were achieved the water was spiked with *E.coli* at a minimum concentration of 1 x 10^6 cfu/100mls using vitroid™ organisms supplied by RTC. Once prepared the challenge water was pumped through the filters in parallel at a rate of 2 l/min, using a cycle of 3 minutes on and 12 minutes off throughout the day (equivalent to the passage of 50 litres through each candle on days 1-4 and 100 litres each on day 5).

Samples of water post filtration were collected from the waste water streams from each filter daily. One sample of challenge water was also collected simultaneously from a sample point immediately upstream of the filter candles rather than the tank. Each sample was collected aseptically into a sterile container containing an appropriate volume of Chambers Neutraliser Solution*.

The samples were analysed to enumerate the challenge organism using the membrane filtration technique ref BP50.15 and reported to FICL as soon as they became available. The comparative study was terminated as soon as breakthrough was achieved which came after 400 litres was passed through the candle.

Turbidity measurements were recorded as 0.41 NTU.

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## Results

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

Table 1

| | Influent (cfu/100ml) | FICL Effluent (cfu/100ml) |
|---|---|---|
| Day 1 | 1800000 | <1 |
| Day 2 | 1000000 | <1 |
| Day 3 | 4200000 | <1 |
| Day 4 | 2000000 | <1 |
| Day 5 | 5400000 | <1 |
| Day 6 | 3800000 | 6 |

Table 2

| | FICL % Filtration Efficiency | FICL Log Reduction |
|---|---|---|
| Day 1 | >99.99994 | >6.26 |
| Day 2 | >99.9999 | >6.0 |
| Day 3 | >99.99997 | >6.62 |
| Day 4 | >99.99995 | >6.3 |
| Day 5 | >99.9999[illegible] | >6.73 |
| Day 6 | 99.9998 | 5.8 |



## Discussion

The FICL manufactured Doulton Sterasyl filter candle achieved at least 5 log removal throughout the 6 day test run (equivalent to 400 Litres of filtration).

## Reference

*Chambers Neutraliser Solution (5% sodium thiosulphate, 7.3% sodium thioglycollate in 100mls water, to be added as 1ml/100ml in sample treated)

Approved by:

Richard Shepherd – Technical Manager, ALcontrol Laboratories UK

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