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AN INVESTIGATION OF THE ANTIMICROBIAL EFFICACY OF  
VILED A PROFESSIONAL'S  
MICROROLL  
MICROFIBRE CLOTH

Presented By; Microsearch Laboratories

Present To ; Mr S. Barber ; Vileda: issue 2

## **1.0 Summary of trial**

Vileda have developed a form of microfibre technology which is a disposable product (MicroRoll). In this trial *in vitro* tests have been performed during which the performance of MicroRoll has been determined in relation to efficiency in the removal of microbial contamination from formite surfaces.

These efficiencies have been measured by employing a test system comprised of a range of wild type organisms dispersed in an organic matrix which were deposited on to the surface of stainless steel plates. The organic matrix was inoculated with organisms prior to deposition.

Performance studies followed where in the difference in numbers of organisms recoverable from test services were compared before and after treatments with the disposable microfibre product.

By expressing this performance in terms percentage reduction of surface contamination we have been able to validate the functionality of MicroRoll.

## **2.0 Test system**

- a) Test Surfaces: The test surface employed consisted of 0.25 M<sup>2</sup> stainless steel tiles.
- b) Contamination: The organic material consisted of a mixture of Egg Albumin (Cohn fraction) and Lecithin dispersed in isotonic saline. Organisms were introduced to this mixture prior to deposition employing a mechanical roller. Inoculated surfaces were dried for 2 hours in a laminar flow cabinet until a contaminated matrix was obtained consisting of a gel containing 10%ww albumin and 8%ww lecithin.
- c) Micro-organisms: The isolates employed in this trial were obtained from clinical sources and had been priorly identified by Ribotyping or sequencing. All cultures were produced by growth on and harvest from non selective media prior to dispersion in Isotonic saline. Primary dispersions were confirmed as viable by spiral plating in appropriate media after initial correction of O.D. at 650 NM. In the case of *Clostridium difficile* Alcohol shock was employed to render test populations into spore form (>97% efficient) as required.

The following categories of organism were employed in the trial;

<u><i>Clostridium difficile</i></u>	(vegetative form 2 strains)
<u><i>Clostridium difficile</i></u>	(spore form 2 strains)
<u><i>Escherichia coli</i></u>	(Antibiotic resistant strain)
<u><i>Staphylococcus aureus</i></u>	(3 strains MRSA variants)

- d) Microbial measurements: Measurements of viable organisms from inoculated and treated test surfaces were obtained by swabbing 6x25cm<sup>2</sup> areas. Swabs were vortexed for 1 minute in 10mls of isotonic saline followed by recovery of viable isolates on non selective media by spiral plating (deposition 100ul spiral log and 0.5ml linear). Recovery conditions and methodology complied with appropriate ISO/EN methodology.
- e) Form of Cloth Usage: In this trial usage of MicroRoll was conducted by a team of six individuals. Each MicroRoll cloth was used once. Prior to use the MicroRoll cloth was "scrunched" and sprayed with tap water containing 1% nonbiocidal detergent. During use the instructions were to track across the width of test surface in reciprocating manner such that the area was covered six times. In this manner a treatment zone was formed from which 6x25cm<sup>2</sup> swabs were taken. Each participant treated 3 test plates in this manner for each organism in the trial.

**3.0 Results Tables:**

Table 1 Cl.difficile vegetative form surface reduction scores

Challenge cfu/cm2                      1.90E+07

Disposable Cloth % reduction	Disposable Cloth Log Reduction
99.9982	4.8
99.9970	4.5
99.9971	4.5
99.9969	4.5
99.9989	5.0
99.9988	4.9
99.9972	4.6
99.9979	4.7
99.9977	4.6
99.9970	4.5
99.9987	4.9
99.9974	4.6
99.9977	4.6
99.9982	4.8
99.9988	4.9
99.9974	4.6
99.9978	4.7
99.9987	4.9
<b>99.9979</b>	<b>4.70</b>

Table 2 Cl.difficile vegetative form surface reduction scores

Challenge cfu/cm2                      2.30E+07

Disposable Cloth % reduction	Disposable Cloth Log Reduction
99.9991	5.0
99.9985	4.8
99.9985	4.8
99.9984	4.8
99.9994	5.2
99.9994	5.2
99.9986	4.8
99.9989	5.0
99.9988	4.9
99.9984	4.8
99.9993	5.2
99.9987	4.9
99.9988	4.9
99.9991	5.0
99.9994	5.2
99.9986	4.9
99.9989	4.9
99.9993	5.2
<b>99.9989</b>	<b>4.98</b>

Table 3 Escherichia coli surface reduction scores

Challenge cfu/cm2                      3.60E+07

Disposable Cloth % reduction	Disposable Cloth Log Reduction
99.9987	4.9
99.9995	5.3
99.9992	5.1
99.9985	4.8
99.9990	5.0
99.9993	5.1
99.9990	5.0
99.9993	5.2
99.9981	4.7
99.9987	4.9
99.9986	4.9
99.9989	5.0
99.9978	4.7
99.9993	5.2
99.9992	5.1
99.9983	4.8
99.9983	4.8
99.9990	5.0
<b>99.9988</b>	<b>4.96</b>

Table 4 M.R.S.A. strains surface reduction scores

Challenge cfu/cm2                      2.90E+07

Disposable Cloth % reduction	Disposable Cloth Log Reduction
99.9995	5.3
99.9995	5.3
99.9991	5.0
99.9992	5.1
99.9990	5.0
99.9994	5.2
99.9991	5.0
99.9992	5.1
99.9993	5.2
99.9992	5.1
99.9991	5.0
99.9991	5.0
99.9990	5.0
99.9992	5.1
99.9993	5.1
99.9992	5.1
99.9987	4.9
99.9990	5.0
<b>99.9992</b>	<b>5.09</b>

Table 5 Summary Efficiency data

Organism	Disposable Cloth % reduction	Disposable Cloth Log Reduction
Cl.difficile (vegetative)	99.9979	4.7
Cl.difficile (spore)	99.9989	5.0
Ecoli	99.9988	5.0
M.R.S.A.	99.9992	5.1

**4.0 Discussion;**

Conventional multi use Microfibre products are of proven ability to achieve satisfactory reduction of microbial loadings on contaminated surfaces. In this trial we have demonstrated the efficiency of a single use disposable variant (MicroRoll) of this technology.

Our data shows that for all organisms examined the removal efficiency of MicroRoll was greater than 99.99% .Such a level of efficiency compares favourably with other industry standard Microfibre technologies.

On this basis I am happy to recommend the Vileda MicroRoll cloth as a further weapon in the arsenal against environmental microbial contamination.



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D.O'Connor B.Sc.(Hon) Ci.Biol M.I.F.S.T.