Test Report

Assessment of the Performance of Two Carpet Disinfectants Applied Through a Sprayer onto a Carpet

Client Details:	Forbo Flooring UK Ltd
Client Contact Name:	John Lewin
Client Email:	John.lewin@forbo.com
PO Number:	4501357416
Date of Report	17/09/2024

Sample Details

Melbec Reference Number:	80760
Sample Name:	Flotex Sheet
Manufacturer/ Supplier:	Forbo Flooring UK Ltd
Batch Number of Sampe:	LOT 16501
Product Storage Condition:	Ambient
Disinfectants Tested:	1. Prochem Microsan Ready to Use (RTU) Spray (Contains 6% solution of D500 Microsan Concentrate) 2. Prochem Clensan Ready to Use (RTU) Spray (Contains 5% solution of B125 Prochem Clensan Concentrate)
Disinfectant Concentrations:	Ready to Use (RTU)
Disinfectant Batch Number:	1. N/A 2. N/A
Rinse Product:	Prochem Fivestar Spray Extracton Machine
Rinse Liquid:	M2 Care Fibresafe Rinse
Rinse Liquid Concentrations:	1:50
Date Product Received:	10/09/2024
Date Test carried out:	10/09/2024

Experimental Conditions

Neutraliser:	N1
Test Temperature:	20±1°C
Contact time:	10 minutes
Testing Surface:	Carpet Supplied by the Client
Incubation temperature:	36°C
Incubation duration:	48 hours
Growth medium:	Violet Red Glucose Bile Agar (VRBGA) for *K. pneumoniae* Mannitol Salt Agar (MSA) for *S. aureus*

Organisms
Staphylococcus aureus ATCC 6538
Klebsiella pneumoniae ATCC 4352

Aim:

To determine the log reductions of the count of the bacterial strains on a carpet when tested against a carpet cleaning machine using disinfectant and then removed using a rinsing machine with rinsing liquid.

Method Overview:

1. 5cm circles were marked out on the carpet.
2. The circles were marked out in triplicate for each organism and product, alongside untreated controls for each organism.
3. Inoculums were prepared in MRD (TNC) at the level of 10^7.
4. 100µL of the organism was inoculated onto each carpet circle and dotted around the circle as much as possible.
5. Disinfectant was applied to the carpet by the client and this was performed using the Flotex Sheet filled with the disinfectant and passing over the inoculated squares once.
6. The disinfectant on the surface of the carpet was then allowed to sit for a 10 minute contact time.
7. After the contact time, the product was rinsed off by the client and this was performed using the spray extraction machine containing M2 Care Fibresafe and passing over the inoculated squares once.
8. The circles were cut out of the carpet and each circle was recovered in 10mL of neutralising broth using a stomacher machine for 1 minute.
9. The liquid was then serially diluted and plated out using organism specific culture media and incubated at 36°C for 48hr.
10. After incubation the plates were counted, and the log for each value was calculated. The decimal log reductions were then determined for each test organism by comparing the log recovery of test organisms from the untreated control and test recovery using the following formula:

Log reduction = log of UC – log T.

Results:

***Klebsiella pneumoniae* ATCC 4352**

Test Suspension (CFU/mL)					
Organism	**Dilution Factor**	**Count 1**	**Count 2**	**Mean CFU/mL**	**Log of N**
K. pneumoniae	10^{-6} 10^{-5}	16 142	15 91	1.20×10^{7}	7.08

Untreated Control (UC)						
	UC (CFU/Carpet Circle) Replicate 1		**UC (CFU/Carpet Circle) Replicate 2**		**UC (CFU/Carpet Circle) Replicate 3**	
10^{x}	**Count 1**	**Count 2**	**Count 1**	**Count 2**	**Count 1**	**Count 2**
N	-	-	-	-	-	-
-1	-	-	-	-	-	-
-2	-	-	-	-	-	-
-3	129	119	126	119	125	102
-4	12	10	11	8	8	7
Mean	1.23×10^{6}		1.20×10^{6}		1.10×10^{6}	
Log	6.09		6.08		6.04	
Mean log of 3 replicates	**6.07**					

Test (T) Product: Prochem Microsan						
	T (CFU/Carpet Circle) Replicate 1		**T (CFU/Carpet Circle) Replicate 2**		**T (CFU/Carpet Circle) Replicate 3**	
10^{x}	**Count 1**	**Count 2**	**Count 1**	**Count 2**	**Count 1**	**Count 2**
N	8	6	3	1	2	1
-1	-	-	-	-	-	-
-2	-	-	-	-	-	-
-3	-	-	-	-	-	-
-4	-	-	-	-	-	-
Mean	7.00×10^{1}		2.00×10^{1}		1.50×10^{1}	
Log	1.85		1.30		1.18	
Mean log of 3 replicates	**1.54**					
Mean Log Reduction	**4.53 (99.997%)**					

Test (T) Product: Prochem Clensan						
	T (CFU/Carpet Circle) Replicate 1		T (CFU/Carpet Circle) Replicate 2		T (CFU/Carpet Circle) Replicate 3	
10^x	Count 1	Count 2	Count 1	Count 2	Count 1	Count 2
N	42	23	72	49	8	6
-1	-	-	5	4	-	-
-2	-	-	-	-	-	-
-3	-	-	-	-	-	-
-4	-	-	-	-	-	-
Mean	3.25×10^2		5.91×10^2		7.00×10^1	
Log	2.51		2.77		1.85	
Mean log of 3 replicates	**2.52**					
Mean Log Reduction	**3.55 (99.97%)**					

Results:

***Staphylococcus aureus* ATCC 6538**

Test Suspension (CFU/mL)					
Organism	**Dilution Factor**	**Count 1**	**Count 2**	**Mean CFU/mL**	**Log of N**
S. aureus	10^{-6}	96	85	9.05×10^{7}	7.96

Untreated Control (UC)						
	UC (CFU/Carpet Circle) Replicate 1		**UC (CFU/Carpet Circle) Replicate 2**		**UC (CFU/Carpet Circle) Replicate 3**	
10^{x}	**Count 1**	**Count 2**	**Count 1**	**Count 2**	**Count 1**	**Count 2**
N	-	-	-	-	-	-
-1	-	-	-	-	-	-
-2	-	-	-	-	-	-
-3	168	167	>330	>330	235	197
-4	17	11	43	35	20	17
Mean	1.65×10^{6}		3.90×10^{6}		2.13×10^{6}	
Log	6.22		6.59		6.33	
Mean log of 3 replicates	**6.41**					

Test (T) Product: Prochem Microsan						
	T (CFU/Carpet Circle) Replicate 1		**T (CFU/Carpet Circle) Replicate 2**		**T (CFU/Carpet Circle) Replicate 3**	
10^{x}	**Count 1**	**Count 2**	**Count 1**	**Count 2**	**Count 1**	**Count 2**
N	>330	>330	>330	>330	273	223
-1	96	94	43	40	23	11
-2	9	7	7	1	-	-
-3	-	-	-	-	-	-
-4	-	-	-	-	-	-
Mean	9.36×10^{3}		4.14×10^{3}		2.41×10^{3}	
Log	3.97		3.62		3.38	
Mean log of 3 replicates	**3.72**					
Mean Log Reduction	**2.69 (99.80%)**					

Test (T) Product: Prochem Clensan						
	T (CFU/Carpet Circle) Replicate 1		T (CFU/Carpet Circle) Replicate 2		T (CFU/Carpet Circle) Replicate 3	
10^x	Count 1	Count 2	Count 1	Count 2	Count 1	Count 2
N	0	0	38	31	248	193
-1	-	-	-	-	28	23
-2	-	-	-	-	-	-
-3	-	-	-	-	-	-
-4	-	-	-	-	-	-
Mean	1.00×10^1		3.45×10^2		2.24×10^3	
Log	1.00		2.54		2.35	
Mean log of 3 replicates	**2.94**					
Mean Log Reduction	**3.47 (99.97%)**					

Note: For calculation purposes, counts of 0 have been reported as 0 instead of <1.

Conclusion:

When tested using the method outlined in this report, the Prochem Microsan product achieved a log reduction of 2.69 (99.80%) for *S. aureus* and 4.53 (99.997%) for *K. pneuominae* when compared to the untreated control. The Prochem Clensan product achieved a log reduction of 3.47 (99.97%) for *S. aureus* and 3.55 (99.97%) against *K. pneumoniae* compared to the untreated control.

Authorised by:

Liam Stephens
Technical Manager