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Report of Analysis

Date of Sample(s) Received:	27.08.2020	**Report No:**	MUM/001621/2020
Date of Job Started:	27.08.2020	**Date of Job Completed:**	17.09.2020
Sample Number(s):	13305006	**Report Date:**	17.09.2020

Method: E2614 Standard Guide for Evaluation of Cleanroom Disinfectants

This guide identifies important factors to consider when selecting a disinfectant for use in a cleanroom or similar controlled environment and recommends test methods suitable for evaluating disinfectants. Reference strains of *Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus, Candida albicans, and Aspergillus niger* or *Aspergillus brasiliensis* are included in the testing for microbiocides to be used in cleanrooms.

Suspension Tests - as per ASTM E 2315 Kill test includes 5- time interval and for *Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus, Candida albicans, and Aspergillus niger* or *Aspergillus brasiliensis* organisms.

Surface Challenge Tests - Test organisms are dried on coupons made of representative substrates from the cleanroom such as stainless steel, aluminium, plastic, and others. Once the inoculum has dried, the test product is applied. After the specified contact time, the coupon is placed in the appropriate neutralization broth and serial dilutions are plated to determine the log reduction of the microorganism.

In Situ Tests - Surface and air sampling was done during the shutdown prior to disinfectant application, and again after the cleanroom is back in operation and disinfected according to procedure. The RTU had prepared on Day 1 of the testing, and used the same had been used for throughout the testing on DAY 1 to DAY 5 for testing efficacy over the time

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Results:

Suspension Tests

Time (Sec.) / Culture	Initial Count (CFU/mL)	10 Sec. (CFU/mL)	30 Sec. (CFU/mL)	60 Sec. (CFU/mL)	180Sec. (CFU/mL)	300 Sec. (CFU/mL)
Escherichia coli **ATCC 8739**	1.28×10^8	<10	<10	<10	<10	<10
% Reduction	NA	>99.99	>99.99	>99.99	>99.99	>99.99
Staphylococcus aureus **ATCC 6538**	1.04×10^8	<10	<10	<10	<10	<10
% Reduction	NA	>99.99	>99.99	>99.99	>99.99	>99.99
Pseudomonas aeruginosa **ATCC 9027**	1.27×10^8	<10	<10	<10	<10	<10
% Reduction	NA	>99.99	>99.99	>99.99	>99.99	>99.99
Candida albicans **ATCC 10231**	1.10×10^8	<10	<10	<10	<10	<10
% Reduction	NA	>99.99	>99.99	>99.99	>99.99	>99.99
Aspergillus brasiliensis **ATCC 16404**	1.00×10^8	<10	<10	<10	<10	<10
% Reduction	NA	>99.99	>99.99	>99.99	>99.99	>99.99

Surface Challenge Tests

Control Sample

Test Organism	No. of Bacteria (CFU/ml)		Percentage reduction %	Log Reduction (R)
	Initial Count (CFU/mL) (B)	Final Count after 10 min Contact time (A)		
Escherichia coli **ATCC 8739**	1.28×10^8	6.5×10^8	NA	NA
Staphylococcus aureus **ATCC 6538**	1.04×10^8	5.7×10^8	NA	NA
Pseudomonas aeruginosa **ATCC 9027**	1.27×10^8	4.2×10^8	NA	NA
Candida albicans **ATCC 10231**	1.10×10^8	6.1×10^8	NA	NA
Aspergillus brasiliensis **ATCC 16404**	1.00×10^8	5.3×10^8	NA	NA

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Plastic Surface

Test Organism	No. of Bacteria (CFU/ml)		Percentage reduction %	Log Reduction (R)
	Initial Count (CFU/mL) (B)	Final Count after 10 min Contact time (A)		
Escherichia coli **ATCC 8739**	1.28×10^8	4.22×10^2	99.99	5.48
Staphylococcus aureus **ATCC 6538**	1.04×10^8	1.50×10^2	99.99	5.84
Pseudomonas aeruginosa **ATCC 9027**	1.27×10^8	2.25×10^3	99.99	4.75
Candida albicans **ATCC 10231**	1.10×10^8	5.76×10^4	99.95	3.28
Aspergillus brasiliensis **ATCC 16404**	1.00×10^8	3.4×10^4	99.97	3.47

Glass Surface

Test Organism	No. of Bacteria (CFU/ml)		Percentage reduction %	Log Reduction (R)
	Initial Count (CFU/mL) (B)	Final Count after 10 min Contact time (A)		
Escherichia coli **ATCC 8739**	1.28×10^8	5.30×10^2	99.99	5.38
Staphylococcus aureus **ATCC 6538**	1.04×10^8	2.30×10^2	99.99	5.66
Pseudomonas aeruginosa **ATCC 9027**	1.27×10^8	3.45×10^3	99.99	4.57
Candida albicans **ATCC 10231**	1.10×10^8	4.30×10^4	99.96	3.41
Aspergillus brasiliensis **ATCC 16404**	1.00×10^8	4.1×10^4	99.96	3.39

Wooden Surface

Test Organism	No. of Bacteria (CFU/ml)		Percentage reduction %	Log Reduction (R)
	Initial Count (CFU/mL) (B)	Final Count after 10 min Contact time (A)		
Escherichia coli **ATCC 8739**	1.28×10^8	6.50×10^2	99.99	5.29
Staphylococcus aureus **ATCC 6538**	1.04×10^8	2.98×10^2	99.99	5.54
Pseudomonas aeruginosa **ATCC 9027**	1.27×10^8	5.40×10^3	99.99	4.37
Candida albicans **ATCC 10231**	1.10×10^8	5.0×10^4	99.95	3.34
Aspergillus brasiliensis **ATCC 16404**	1.00×10^8	2.8×10^4	99.97	3.55

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In Situ Tests

Before Exposure

Sr. No.	Parameter	Units	Result				
			Day 1	Day 2	Day 3	Day 4	Day 5
1.	Total Viable Count (Total plate count)	CFU/ml	1.8×10^2	2.5×10^2	1.95×10^2	2.25×10^2	2.43×10^2
2.	Fungal count (Yeast & Mould)	CFU/ml	8.7×10^1	9.1×10^1	7.0×10^1	9.7×10^1	1.18×10^2

After Exposure

Sr. No.	Parameter	Units	Result				
			Day 1	Day 2	Day 3	Day 4	Day 5
1.	Total Viable Count (Total plate count)	CFU/ml	01	04	02	18	32
2.	Fungal count (Yeast & Mould)	CFU/ml	03	06	04	10	15
Percent Reduction in Bacterial		%	99.44	98.40	98.97	92.00	86.83
Percent Reduction in Fungi		%	96.55	93.40	94.28	89.69	78.81

Authorized Signatory

Dhanashree Bhelose
Asst. Manager – Business Development & Laboratory Caleb Brett