



CHEMSIL AIR & WATER SDN BHD

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CERTIFICATE OF ANALYSIS

EXCELSIA TECHNOLOGIES SDN BHD
UNIT 103, 1ST FLOOR, LIF NO.2, BLOCK C,
DAMANSARA INTAN, NO.1, JALAN SS20/27, 47400
PETALING JAYA, SELANGOR.

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LAB NO. : CAW/2004/93635
SAMPLE ID : CAW/2004/92635/260189
SAMPLE MARKING : BACTAKLEEN MARVEKLEEN
NATURE OF SAMPLE : MISCELLANEOUS
RECEIVED DATE : 06TH APRIL 2020
ANALYSIS DATE : 06TH APRIL 2020
REPORTED DATE : 15TH APRIL 2020

TEST: CHALLENGE TEST

Organisms used to challenge:

- a) *Staphylococcus aureus* (ATCC 6538)
- b) *Escherichia coli* (ATCC 8739)
- c) *Pseudomonas aeruginosa* (ATCC 9027)
- d) *Candida albicans* (ATCC 10231)
- e) *Aspergillus brasiliensis* (ATCC 16404)

Procedure:

- 1) Prepare culture of organism to be challenged from pure working culture by subculturing onto Tryptic Soy Agar slant for bacteria and Sabouraud Dextrose Agar for mould and yeast.
- 2) Incubate the cultures at 35°C for 24 hour for all the cultures except yeast and mould at 25°C for 3-5 days.
- 3) Prepare inoculum suspension to be spiked into sample by comparing the turbidity with Mc Farland Standard solution and perform serial dilution $10^8 - 10^1$.
- 4) Use dilutions 10^3 to 10^1 to estimate the colonies count in the suspension by plating 1ml of each dilution onto petri dishes. Bacteria were poured with TSA while fungal with SDA and incubate.
- 5) Spread plate 0.1ml of 10^8 for bacteria and 10^7 for fungal cfu/ml inoculum suspension onto an even sterilized surface.
- 6) Spray the sample on the surface and let dry.
- 7) Do swab sampling at each contact time. Then, carry out serial dilution using diluent containing 8% Polysorbate 80 for the sample. Polysorbate 80 acts as neutralizer to inhibit the disinfectant property of the sample, so actual efficacy of sample can be studied for specific contact time.
- 8) Transfer 1ml of each dilution on petri dish and perform pour plate with respective media. Incubate the plates with condition as follow:
 - a) *S. aureus*, *P. aeruginosa* and *E. coli* - 35°C for 72h
 - b) *C. albicans* and *A. brasiliensis* - 25°C for 3-5d

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*Contact time at 0 minute

Test Parameter	Inoculum Used (cfu/ml)	Inoculum Recovered - 0min	**Percentage Killed (%)
<i>S. aureus</i>	2.7×10^7	5.8×10^5	97.852%
<i>E. coli</i>	2.0×10^7	7.8×10^5	96.100%
<i>P. aeruginosa</i>	1.9×10^7	5.3×10^4	99.721%
<i>C. albicans</i>	1.3×10^7	NG (<10)	99.999%
<i>A. brasiliensis</i>	9.2×10^6	4.8×10^2	99.995%

*Contact time at 5 minute

Test Parameter	Inoculum Used (cfu/ml)	Inoculum Recovered - 5mins	**Percentage Killed (%)
<i>S. aureus</i>	2.7×10^7	4.4×10^4	99.837%
<i>E. coli</i>	2.0×10^7	8.8×10^4	99.560%
<i>P. aeruginosa</i>	1.9×10^7	2.5×10^3	99.987%
<i>C. albicans</i>	1.3×10^7	NG (<10)	99.999%
<i>A. brasiliensis</i>	9.2×10^6	3.6×10^2	99.996%

*Contact time at 15 minute

Test Parameter	Inoculum Used (cfu/ml)	Inoculum Recovered - 15mins	**Percentage Killed (%)
<i>S. aureus</i>	2.7×10^7	2.4×10^4	99.911%
<i>E. coli</i>	2.0×10^7	6.1×10^4	99.695%
<i>P. aeruginosa</i>	1.9×10^7	4.9×10^2	99.999%
<i>C. albicans</i>	1.3×10^7	NG (<10)	99.999%
<i>A. brasiliensis</i>	9.2×10^6	2.5×10^2	99.997%

*Contact time at 30 minute

Test Parameter	Inoculum Used (cfu/ml)	Inoculum Recovered - 30mins	**Percentage Killed (%)
<i>S. aureus</i>	2.7×10^7	6.9×10^3	99.974%
<i>E. coli</i>	2.0×10^7	1.1×10^3	99.995%
<i>P. aeruginosa</i>	1.9×10^7	NG (<10)	99.999%
<i>C. albicans</i>	1.3×10^7	NG (<10)	99.999%
<i>A. brasiliensis</i>	9.2×10^6	2.1×10^2	99.995%

CERTIFICATE OF ANALYSIS

*Contact time at 60 minute

Test Parameter	Inoculum Used (cfu/ml)	Inoculum Recovered - 60mins	**Percentage Killed (%)
<i>S. aureus</i>	2.7×10^7	4.0×10^1	99.999%
<i>E. coli</i>	2.0×10^7	1.0×10^1	99.999%
<i>P. aeruginosa</i>	1.9×10^7	NG <10	99.999%
<i>C. albicans</i>	1.3×10^7	NG <10	99.999%
<i>A. brasiliensis</i>	9.2×10^6	1.5×10^2	99.998%

*Contact time at 3 hours

Test Parameter	Inoculum Used (cfu/ml)	Inoculum Recovered - 3hours	**Percentage Killed (%)
<i>S. aureus</i>	2.7×10^7	NG <10	99.999%
<i>E. coli</i>	2.0×10^7	NG <10	99.999%
<i>P. aeruginosa</i>	1.9×10^7	NG <10	99.999%
<i>C. albicans</i>	1.3×10^7	NG <10	99.999%
<i>A. brasiliensis</i>	9.2×10^6	3.0×10^1	99.999%

* Contact time is time of contact between sample and culture

** Percentage Killed = $\frac{\text{Inoculum used} - \text{Inoculum Recovered}}{\text{Inoculum Used}} \times 100\%$

Note:

- 1) NG means No Growth
- 2) cfu means Colony Forming Unit
- 3) Test was done according to In House Method BP 2013.
- 4) Opinion and Interpretation expressed herein are outside the scope of SMM accreditation. The above results relate only to the items tested. This report shall not be reproduced, without the written approval of Chemsil Air & Water Sdn. Bhd.

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