

Antibacterial Properties Test Report

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1. Purpose

To evaluate the antibacterial properties of an antibacterial product

2. Test Parameters

Materials tested:

- (1) Clean Eco Guard
- (2) Clean Air Refresh
- (3) VOC Clean Air Guard
- (4) (1) after washing 5 times
- (5) (2) after washing 5 times
- (6) (3) after washing 5 times

3. Measurement method

Antibacterial Properties Test (standard test method)

Following the Quantitative Antibacterial Test Method for Textile Products (JISL1902)

Test Bacteria:	Klebsiella pneumoniae (NBRC 13277) Staphylococcus aureus (NBRC 12732)
Nutrient/Culture:	1/20 concentration of nutrient broth (150 mg/L of meat extract combined with 250 mg/L of peptone)
Measurement Method:	Insert 0.4 g of the material to be tested in a glass vial, drop 0.2 ml of bacterial solution (Borderline activity solution Tween 80, 0.05% added) and after culturing for 18 hours at 37°C, wash and measure the remaining live bacteria.

4. Measurement Results (n = average of two values)

Klebsiella pneumoniae

Cultured Bacteria Count [A]	2.0×10^5	Log A	5.3
Untreated Cloth Bacterial Count [B]	3.4×10^7	Log B	7.5

$\text{Log B} - \text{Log A} = 2.2 > 1.5$ (positive result)

Bacteriostatic Activity Rate = $\text{Log B} - \text{Log C}$

Antibacterial Activity Rate = $\text{Log A} - \text{Log C}$

Material Tested	Live Bacterial Count	Log C	Bacteriostatic Activity Rate	Antibacterial Activity Rate
(1)	$< 10^2$	< 2.0	> 5.5	> 3.3
(2)	$< 10^2$	< 2.0	> 5.5	> 3.3
(3)	$< 10^2$	< 2.0	> 5.5	> 3.3

Klebsiella pneumoniae

Cultured Bacteria Count [A]	1.4×10^5	Log A	5.1
Untreated Cloth Bacterial Count [B]	4.8×10^7	Log B	7.7

$\text{Log B} - \text{Log A} = 2.6 > 1.5$ (positive result)

Bacteriostatic Activity Rate = $\text{Log B} - \text{Log C}$

Antibacterial Activity Rate = $\text{Log A} - \text{Log C}$

Material Tested	Live Bacterial Count	Log C	Bacteriostatic Activity Rate	Antibacterial Activity Rate
(4)	$< 10^2$	< 2.0	> 5.7	> 3.1
(5)	$< 10^2$	< 2.0	> 5.7	> 3.1
(6)	7.6×10^4	4.9	2.8	0.2

- For antibacterial and deodorant treatment, activity rates of 2.2 or higher is passing.
- For controlling bacteria treatment, activity rates of 0.0 or higher is passing.

5. Further Measurement Results (n = average of two values)

Staphylococcus aureus

Cultured Bacteria Count [A]	1.7×10^5	Log A	5.2
Untreated Cloth Bacterial Count [B]	1.3×10^7	Log B	7.1

$\text{Log B} - \text{Log A} = 1.9 > 1.5$ (positive result)

Bacteriostatic Activity Rate = $\text{Log B} - \text{Log C}$

Antibacterial Activity Rate = $\text{Log A} - \text{Log C}$

Material Tested	Live Bacterial Count	Log C	Bacteriostatic Activity Rate	Antibacterial Activity Rate
(1)	$< 10^2$	< 2.0	> 5.1	> 3.2
(2)	$< 10^2$	< 2.0	> 5.1	> 3.2
(3)	$< 10^2$	< 2.0	> 5.1	> 3.2

Staphylococcus aureus

Cultured Bacteria Count [A]	1.4×10^5	Log A	5.1
Untreated Cloth Bacterial Count [B]	4.8×10^7	Log B	7.2

$\text{Log B} - \text{Log A} = 2.1 > 1.5$ (positive result)

Bacteriostatic Activity Rate = $\text{Log B} - \text{Log C}$

Antibacterial Activity Rate = $\text{Log A} - \text{Log C}$

Material Tested	Live Bacterial Count	Log C	Bacteriostatic Activity Rate	Antibacterial Activity Rate
(4)	$< 10^2$	< 2.0	> 5.2	> 3.1
(5)	$< 10^2$	< 2.0	> 5.2	> 3.1
(6)	$< 10^2$	< 2.0	> 5.2	> 3.1

- For antibacterial and deodorant treatment, activity rates of 2.2 or higher is passing.
- For controlling bacteria treatment, activity rates of 0.0 or higher is passing.