



TEST REPORT

General Ceramics Co Ltd.

Report No: WD-R-250820-0214
Sample No: WD-S-250820-0515
Report Date: 15/09/2025

Sample Description : Ceramic Tile Sample
Sample Received : 20/08/2025
Test Date : 20/08/2025 - 15/09/2025
Sample tested by : SE

Introduction

Further to the requisition received from Royale Smart Clean dated 20th August 2025, the sample was tested for antimicrobial efficacy, and the results are as follows.

Test for Antibacterial Activity

1.0 Test protocol reference

In-House protocol: ISO 22196:2011: Measurement of antibacterial activity on paint, plastic, and other non-porous products.

2.0 Methodology

Test specimens were prepared by 5 by 5cm and were used as test samples. Three specimens and controls were analyzed.

Testing was carried out using a procedure based on ISO 22196:2011. Two separate tests were carried out using *Staphylococcus aureus* and *Escherichia coli* respectively as the test organism.

In each test 0.4ml of a suspension of the test organism was placed on the surface of the triplicate test pieces and on triplicate samples of polyethylene sheet only (used as the laboratory control and known to have no antimicrobial activity). The suspension was held in intimate contact with the test and control surfaces. To provide a time zero inoculation level, an additional triplicate set of laboratory control samples (polyethylene sheet) were inoculated and washed off immediately, each into 10 ml of sterile neutralizer solution and bacterial counts determined to give a time zero count.

The remaining replicates were incubated at 35±1°C and relative humidity of not less than 90%. After 24±2 hours incubation the test pieces were washed off and bacterial counts determined.

3.0 Results and Observations

The bacterial counts obtained (shown as a geometric mean), together with the antibacterial activity (shown as a Log 10 reduction) and the kill rate (shown as a percentage), are given in Table 1, (*Staphylococcus aureus*) and Table 2 (*Escherichia coli*).



The antibacterial activity is calculated as follows:

$$R = [\log (B/A) - \log (C/A)] = [\log (B/C)]$$

Where, R = Antibacterial activity

A = Mean bacterial count on laboratory control sample at time zero (Initial count)

B = Mean bacterial count on laboratory control sample after 24 hours.

C = Mean bacterial count on test piece after 24 hours.

Table 1: Antimicrobial Activity (Staphylococcus aureus)

Nonporous substrate under investigation	Test Sample	Mean bacterial count			Log Reduction
		Viable count starts of the test	Viable recovered bacteria (immediate)	Viable recovered bacteria (24 hr)	
Ceramic Tile Sample	Laboratory control	6.1 x 10 ⁵	3.1 x 10 ⁵	1.3 x 10 ⁵	>4
	Ceramic Tile Sample		8.1 x 10 ⁴	<10	

Table 2: Antimicrobial Activity (Escherichia coli)

Nonporous substrate under investigation	Test Sample	Mean bacterial count			Log Reduction
		Viable count starts of the test	Viable recovered bacteria (immediate)	Viable recovered bacteria (24 hr)	
Ceramic Tile Sample	Laboratory control	6.2 x 10 ⁵	2.2 x 10 ⁵	2.2 x 10 ⁵	>4
	Ceramic Tile Sample		7.1 x 10 ⁴	<10	



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4.0 **Conclusion**

It is concluded from this study that, the tested sample showed >99.99% antibacterial activity against tested bacterial cultures respectively.

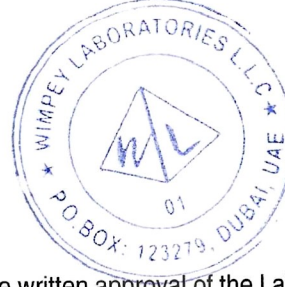
Signed for and on behalf of Wimpey Laboratories

Parvathy Suresh

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Test results relate only to the samples tested.

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