

Ciba Corporation / Safas Corporation

(USA)

Evaluation of antimicrobial efficacy of synthetic marble samples containing Irgaguard B 5000 against *Escherichia coli* & *Staphylococcus aureus*.

Technical Report # 152

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1. Purpose

Evaluation of antimicrobial efficacy of synthetic marble samples containing Irgaguard B5000 provided by Ciba Corporation, USA/Safas Corporation

2. Conclusion and considerations

- Table 1 shows the results of evaluation of antimicrobial efficacy against *Staphylococcus aureus*.
- Table 2 shows antimicrobial efficacy against *Escherichia coli*.
- Every sample containing B 5000 had sufficient antimicrobial efficacy.

3. Evaluation

3.1 Test sample

1. 090224 (1) - 1% B5000
2. 090224 (2) - 2% B5000
3. 090224 (3) - 3% B5000
4. 090304 (1) - 1% B5000
5. 090304 (2) - 2% B5000

3.2 Test method and conditions

Testing institution: Japan Spinners Inspecting Foundation

Method: JIS Z 2801 Quantitative Test

Bacteria: *Staphylococcus aureus* (NBRC 12732)
Escherichia coli (NBRC 3972)

Procedure:

In accordance with JIS Z 2801-2000, bacteria were instilled on the samples, covered with a regular film, and kept at 35°C for 24hrs. The number of viable cells of bacteria was counted. Value of antimicrobial activity of each sample was calculated according to the following formula:

$$R = \log B/C$$

where:

R: value of antimicrobial activity

B: average of the number of bacteria on the control samples (untreated samples) after incubation for 24 hrs

C: average of the number of bacteria on the antimicrobial samples (treated samples) after incubation for 24 hrs

Criteria for judging antimicrobial efficacy:

The value of antimicrobial activity shall not be under 2.0 for the antimicrobial efficacy of antimicrobial products. In other words, when the value is 2.0 or more, the treated sample is judged to have antimicrobial efficacy based on JIS Z 2801.

Blank film:

Blank film can be used as a control sample in substitution for untreated sample when the untreated samples are not available and do not have any effect on antimicrobial efficacy. Covering film of size 5cm × 5cm is commonly used.

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4. Test results

Table 1 Antimicrobial efficacy against *Staphylococcus aureus*
(Number of bacteria immediately after inoculation: 2.2×10^5)

Test sample	Number of bacteria after incubation for 24 hrs	Antimicrobial activity (R)
1. 090224 (1)	<10	4.7
2. 090224 (2)	<10	4.7
3. 090224 (3)	<10	4.7
4. 090304 (1)	<10	4.7
5. 090304 (2)	<10	4.7
Blank film	6.3×10^5	-

Table 2 Antimicrobial efficacy against *Escherichia coli*
(Number of bacteria immediately after inoculation: 2.0×10^5)

Test sample	Number of bacteria after incubation for 24 hrs	Antimicrobial activity (R)
1. 090224 (1)	<10	6.4
2. 090224 (2)	<10	6.4
3. 090224 (3)	<10	6.4
4. 090304 (1)	<10	6.4
5. 090304 (2)	<10	6.4
Blank film	2.7×10^7	-

Please note that estimation of antimicrobial concentration was not possible for the following reasons:

- 1) Samples contain a large amount of filler (probably, aluminum hydroxide).
- 2) Concentration of B 5000 in whole sample is very small, since B 5000 is contained in only the gel coating layer.