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Ropimex R. Opel GmbH
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66538 Neunkirchen

Customer No.: 10089634
Order No.: 4301155
Sample No.: 171024006



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Consumer and Retail
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SGS INSTITUT FRESENIUS
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Taunusstein, 20.11.2017

Report No.: 4135050-02

Quantitative analysis of the antimicrobial effect based on ASTM E 2180

Sample Entry: 25.09.2017
Testing Period: 02.11.2017 – 10.11.2017

SGS Sample Number	Sample Designation:
171024006	ceramic tiles (OP-Fliesen) coated with Bacoban Food / WBDLUS, Lot 709221, MHD 09 2018
OP-Fliese	ceramic tiles uncoated (Reference)

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Test conditions:

The Test was performed based on

ASTM E 2180 – Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) In Polymeric or Hydrophobic Materials

With this diagnose it is possible to see if the product has an antimicrobial surface. Both test surfaces have been covered with a defined number of microorganisms in a suitable culture medium and evaluated after 24 hours. Uncoated, not antimicrobial appparelled test surfaces were used as reference (analysis after 0 and 24 hours).

Incubation temperature: Bacteria 36°C ± 2°C; Yeast 22,5°C ± 2,5°C.

The test procedure takes place after 10 days of pre-treatment of the ceramic tiles (OP-Fliesen) with the testing substance (0.1 mL/surface).

Requirement: ≥ 2 log (JIS Z 2801)

Test organism suspension:

Bacterial strains were used for the test:

- Pseudomonas aeruginosa (ATCC 15442)*
- Staphylococcus aureus (ATCC 6538)*
- Escherichia coli (ATCC 8739)*
- Candida albicans (ATCC 10231)*
- Aspergillus brasiliensis (ATCC 16404)*

0.4 mL of the sustainable agar test suspension was taken onto test surface. The instilled test suspension was covered with a film (coverslip).

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Results:

Table 1: Test suspension

Test-microorganisms	inoculum, [cfu/mL]
<i>Pseudomonas aeruginosa</i> (ATCC 15442)	4.95 x 10 ⁸
<i>Staphylococcus aureus</i> (ATCC 6538)	4.00 x 10 ⁸
<i>Escherichia coli</i> (ATCC 8739)	4.70 x 10 ⁸
<i>Candida albicans</i> (ATCC 10231)	4.60 x 10 ⁸
<i>Aspergillus brasiliensis</i> (ATCC 16404)	2.55 x 10 ⁸
cfu: colony forming units	

Table 2: Reference material: ceramic tiles (OP-Fliesen)

(Sample No.: OP-Fliesen)	Untreated surface: ceramic tiles (OP-Fliesen)		
	cfu/test surface after 0h *	cfu/test surface after 24h *	log/test surface after 24h *
<i>Pseudomonas aeruginosa</i> (ATCC 15442)	> 3.02 x 10 ⁶	> 3.02 x 10 ⁶	> 6.48
<i>Staphylococcus aureus</i> (ATCC 6538)	2.45 x 10 ⁶	1.86 x 10 ⁶	6.27
<i>Escherichia coli</i> (ATCC 8739)	2.14 x 10 ⁶	> 3.02 x 10 ⁶	> 6.48
<i>Candida albicans</i> (ATCC 10231)	2.04 x 10 ⁶	> 3.02 x 10 ⁶	> 6.48
<i>Aspergillus brasiliensis</i> (ATCC 16404)	1.32 x 10 ⁶	1.23 x 10 ⁶	6.09
cfu: colony forming units			
* = Average value of 3 approaches			

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Table 2.1: Bacoban Food / WBDLUS, Lot 709221, MHD 09 2018

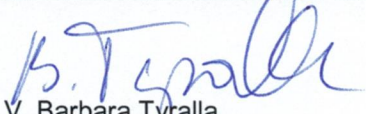
(Sample No.: 171024006)	Treated surface: ceramic tiles (OP-Fliesen) with Bacoban		
Test-microorganisms	cfu/test surface after 0h *	cfu/test surface after 24h *	Reduction R [log]
<i>Pseudomonas aeruginosa</i> (ATCC 15442)	< 100	< 100	> 4.48
<i>Staphylococcus aureus</i> (ATCC 6538)	< 100	< 100	4.27
<i>Escherichia coli</i> (ATCC 8739)	< 100	< 100	> 4.48
<i>Candida albicans</i> (ATCC 10231)	< 100	< 100	> 4.48
<i>Aspergillus brasiliensis</i> (ATCC 16404)	2.45 x 10 ⁴	1.81 x 10 ²	3.83

R: log (untreated test surface after 24 h / treated test surface after 24 h)
 cfu: colony forming units
 * = Average value of 3 approaches

Assessment:

According to the results of the test the product **Bacoban Food / WBDLUS, Lot 709221, MHD 09 2018** shows a strong bactericidal and fungicidal activity against tested test-microorganisms under the given conditions.

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 i. A. Anica Lukic
 CUSTOMER SERVICE ASSISTANT

The test results refer exclusively to the examined test items and the date of the test under the test specifications
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