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Aschaffenburg, 17 September 2018

From: Bie-schu
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REPORT

Order No.: 18571/1 **Page 1 of 3 pages**

Client: Chimica Pomponesco SpA
Via delle Industrie 1
46030 Pomponesco (Mn) / Italy

Date of order: 24 July 2018

Receipt of sample material: 25 July 2018

Origin of sample material: From the client

Purpose: Analysis of the antimicrobial efficacy according to ISO 22196

(Dr. Derra)
Managing Director

(Dr. Biester)
Dipl.-Biologist
Head of
Microbiology Department

The present report refers exclusively to the samples as laid out therein. Information and statistical data on the results can be obtained on request.

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-14160-01-01
D-PL-14160-01-02

Sample Material

For analysis, two coated chipboard samples with the following designations were in hand:

Sample 1:	Sample without antibacterial additive, reference
Sample 2:	Sample with antibacterial additive

Carrying out of the Tests

Examination period: 26 July 2018 to 13 September 2018

Test for Antibacterial Efficacy *

The determination was performed according to 22196:2011-08.

The test specimens were contaminated with the test organism on 4 x 4 cm of the coated surface. Immediately after inoculation the germ suspension was removed from some test pieces with Neutralizing Broth and the number of germs was determined (T_0). The remaining test pieces were stored in a humid chamber. After 6 hours the germ suspension was removed and the germ count on these samples was determined (T_6) as well.

The samples were cleaned with 70 % ethanol before the test was started.

Test organism:	*Staphylococcus aureus* (DSM 799) *Escherichia coli* (DSM 1576)
Volume of germ suspension:	600 µl per sample specimen
Sample specimen size:	5 x 5 cm
Film size:	4 x 4 cm
Neutralization broth:	BD Difco D/E Neutralizing Broth
Storage conditions:	36 ± 1 °C, 6 h
Nutrient medium:	PC-Agar

Calculation of antibacterial activity R:

$$R = (U_t - U_0) - (A_t - U_0) = U_t - A_t$$

- R = antibacterial activity
- U_0 = average of logarithm numbers of viable bacteria [cells/cm^2] immediately after inoculation on reference test pieces
- U_t = average of logarithm numbers of viable bacteria [cells/cm^2] after 6 hours of incubation on the reference test pieces
- A_t = average of logarithm numbers of viable bacteria [cells/cm^2] after 6 hours of incubation on the equipped test pieces

Additionally, the logarithmic and percent reductions were calculated in comparison to the average initial numbers of bacteria on the reference material.

Result:

***Staphylococcus aureus* (DSM 799)**

	Sample 1	Sample 2
Average CFU/cm² (0 h)	1.7×10^4	---
Average CFU/cm² (6 h)	1.7×10^3	15
U_0 = Log CFU/cm² (0 h)	4.2	---
U_t = Log CFU/cm² (6 h)	3.0	---
A_t = Log CFU/cm² (6 h)	---	0.7
%-reduction (6 h)	---	99.90
log-reduction (6 h)	---	3.5
antibacterial activity R	---	2.3

CFU = colony-forming units

***Escherichia coli* (DSM 1576)**

	Sample 1	Sample 2
Average CFU/cm² (0 h)	8.4×10^3	---
Average CFU/cm² (6 h)	5.9×10^3	15
U_0 = Log CFU/cm² (0 h)	3.9	---
U_t = Log CFU/cm² (6 h)	3.7	---
A_t = Log CFU/cm² (6 h)	---	0.6
%-reduction (6 h)	---	99.85
log-reduction (6 h)		3.3
antibacterial activity R	---	3.1

CFU = colony-forming units

The accreditation applies to the methods marked with * in the test report (Register no. D-PL-14160-01-01 and D-PL-14160-01-02). End of report