HOHENSTEIN

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Zentralstelle der Länder für Gesundheitsschutz bei Arzneimitteln und Medizinprodukten
www.zlg.de
ZLG-P-431.09.09
The accreditation applies for the test methods listed in the certificate - marked Z in the report.

ilac-MRA
DEUTSCHES AKKREDITIERUNGSSYSTEM PRÜFWESEN GMBH
DAP
DAP-PL-1603.00
The accreditation applies for the test methods listed in the certificate - marked A in the report.

Customer No.	Contact Person	Our Ref.	Date
48222	Jutta Secker	prof. dh-se	01 March 2010

Test Report No. 10.8.3-0023-I

This test report replaces the original test report no. 10.8.3-0023.

Customer:	see address
Test sample:	Cotton fabric, 1 time washed together with woven fabric “Silver Wash”
Sample labelling:	see table
Date of receipt order:	2010-02-15
Period of testing:	2010-02-16 to 2010-02-26
Sampling	The sample (woven fabric “Silver Wash”) has been handed over to us by the customer. Hohenstein Institute did the washing according to ISO 6330.

The test report comprises 4 pages.

AIM OF TESTS

Textile materials – Determining the antibacterial activity.

METHODS

DIN EN ISO 20743[A,Z]: 10-2007: "Textiles - Determination of the antibacterial activity of antibacterial finished products"
Test strains: *Staphylococcus aureus* ATCC 6538, *Klebsiella pneumoniae* ATCC 4352

The following modifications were done

Sterilisation	UV
Thinning agent for inoculation [3)]	NaCl 0,9 % + 0,05 % Tween 80
Thinning agent for eluation	NaCl 0,9 % + 0,20 % Tween 80
Calculation	$\log_{10}C_0 = \log_{10}T_0$

The cotton-fabric was washed together with the woven fabric „SilverStar"1 time according to a domestic washing process.

Washing conditions:

Machine:	Miele Softtronic W 1734 WPS
Program	low maintenances
Temperature:	30 °C
Water hardness:	14 °dH
Detergent:	53,3 g Ariel Color & Style fluid
Loading:	in total 2,5 kg; clean additional loading Make-weights (WFK)

CALCULATION

The value of germ growth is calculated over 18 hours on the sample, in comparison to the control or reference material and according to the formula:

$$A = (\log_{10}C_{18h} - \log_{10}C_{0h}) - (\log_{10}T_{18h} - \log_{10}T_{0h})$$

C =control / reference material
T = sample

TEST MATERIAL

Sample	Sample - number
Cotton fabric, 1 time washed together with woven fabric "Silver Wash"	3-0023

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RESULT

CONTROL MATERIAL, NON TREATED PES

Growth value

	average value [cfu]	average value [log cfu]	growth value [3] [log cfu]
***Staphylococcus aureus* ATCC 6538**			
0 h	$3{,}90 \times 10^5$	5,59 [1]	--
18 h	$3{,}82 \times 10^5$	5,58 [2]	-0,01
***Klebsiella pneumoniae* ATCC 4352**			
0 h	$5{,}47 \times 10^4$	4,74 [1]	--
18 h	$2{,}37 \times 10^7$	7,37 [2]	2,64

[1] *Common logarithm of number of viable bacteria (average of 3 test pieces) immediately after inoculation on untreated specimen;*

[2] *common logarithm of number of viable bacteria (average of 3 test pieces) after 18 hour incubation on untreated specimen;*

[3] *Difference between [2] and [1] = growth value*

The growth value is not part of the calculation but an internal control. A growth value up to –1, especial for S. aureus, is possible under given modifications

SAMPLE „3-0023“

Antibacterial activity

	average value [cfu]	average value [log cfu]	reduction [1] [log cfu]
***Staphylococcus aureus* ATCC 6538**			
0 h	--	--	2,24
18 h	$2{,}22 \times 10^3$	3,35 [1]	
***Klebsiella pneumoniae* ATCC 4352**			
0 h	--	--	4,10
18 h	$1{,}88 \times 10^3$	3,27 [1]	

[1] *common logarithm of number of viable bacteria (average of 3 test pieces) after 18 hours incubation on treated specimen.*

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EVALUATION

*ASSESSMENT CRITERIA**

**Grading of assessment by the Hohenstein Laboratories:*

antibacterial activity	growth reduction efficacy [log cfu]
no	< 0,5
slight	≥ 0,5 to < 1 *)
significant	≥ 1 to < 3
strong	≥ 3

*) *Due to the biological variance (lab standard ± 0.5 log steps) a certificate of the antimicrobial activity can be exposed only if a significant efficacy is given – independent of the antibacterial graduation.*

ASSESSMENT

Controls:

The biological activity of the test strains and the results of the controls were not to object. The experimental procedure was valid.

Sample 3-0023: Cotton fabric, 1 time washed with woven fabric "Silver Wash"

There is a **significant** antibacterial activity with the test strain *Staphylococcus aureus* ATCC 6538 and a **strong** reduction of the test strain *Klebsiella pneumoniae* ATCC 4352 under given test conditions for the tested samples, calculated with the control material (non treated PES) .

Schloss Hohenstein, 01 March 2010

Director of the Institute for Hygiene and Biotechnology

Prof. Dr. Dirk Höfer

Hohenstein Laboratories · Schloss Hohenstein ·

Head of Laboratory of the Institute for Hygiene and Biotechnology

Dipl.-Biol. Jutta Secker