TESTING LABORATORY
Cejl 480/12, 602 00 Brno, Czech Republic

TESTING LABORATORY 1001

accredited according to ČSN EN ISO/IEC 17025:2018 by the Czech Accreditation Institute

TEST REPORT

AZL 26/0438-01

CUSTOMER:	**FabricAir A/S** Sandvadsvej 2 DK-4600 Køge Denmark
SAMPLE: **(according to the customer order)**	**Combi Eco 80** Fibre composition: dope-dyed polyester yarn Colour: blue

CONDITIONS OF APPLICATION OF THE TEST REPORT:

The laboratory is not responsible for information supplied by the customer that may affect the validity of test results.

Test Report contains results of the tests related to the submitted sample only. Sampling has been done by the customer. The Report may not be reproduced in any way other than as a complete set. Reproduction of certain parts of the Report is subject to approval of the test laboratory, which has issued it. All information about subcontracted tests results or unaccredited test methods is presented in text part of the test report. Unless otherwise stated, all tests were performed at the address, listed in the header.

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Determination of antibacterial activity by agar diffusion plate test
was determined according to ČSN EN ISO 20645.

Used bacteria (cultures delivered from Czech collection of Microorganisms):

CCM 8853 = ATCC 4352	*Klebsiella pneumoniae*
CCM 4516 = ATCC 6538	*Staphylococcus aureus*

Conditions of assessment:

- diameter of test specimen: Ø 25 mm
- number of samples: (4 + 4) treated samples, (4 + 4) untreated references
- storage of the specimens prior to the test: at room temperature in sterilized Petri dishes
- temperature in incubator: (37 ± 1) °C
- influence time: 24 h

The bacterial growth in the nutrient medium under the test specimen was assessed according to following table:

Mean value of inhibition zone (mm)	Growth	Assessment
> 1 1 - 0 0	none none none	good effect
0	slight	limit of efficacy
0 0	moderate heavy	insufficient effect

Result: Assessment of bacterial growth in the nutrient medium under the test specimen with corresponding assessment.

Result			
Growth			Assessment
K. pneumoniae	face side	none (IZ = 0 mm)	good effect
	reverse side	none (IZ = 0 mm)	good effect
S. aureus	face side	none (IZ = 1 mm)	good effect
	reverse side	none (IZ = 1 mm)	good effect

IZ … inhibition zone

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Determination of antibacterial activity by absorption, culture method
was determined according to ČSN EN ISO 20743 Absorption method.

Used bacteria (cultures delivered from Czech collection of Microorganisms):

CCM 8853 = ATCC 4352	*Klebsiella pneumoniae*
CCM 4516 = ATCC 6538	*Staphylococcus aureus*

Conditions of assessment:

- mass of samples: (0.40 ± 0.05) g
- number of samples for each used germ: 6 untreated references, 6 treated samples
- concentration of testing inoculum: *K. pneumoniae* 1.1 x 10^5 CFU/ml, *S. aureus* 1.0 x 10^5 CFU/ml
- inoculated volume on test specimens: 0.2 ml
- influence time: 24 h
- temperature in incubator: (37 ± 2) °C
- incubation time of Petri dishes: 24 h

Results: The antibacterial activity value is obtained according to the following formula and it says, by how many logarithmic orders the growth of the tested bacteria in the treated sample is lower comparing to the untreated reference

$$A = (\log Ct - \log C0) - (\log Tt - \log T0) = F - G$$

where
A is the antibacterial activity value
F is the growth value on the control fabric (F = log Ct – log C0)
G is the growth value on the antibacterial-treated sample (G = log Tt – log T0)
log Ct is the average common logarithm for the number of bacteria obtained from three test samples of control fabric after an 18 h to 24 h incubation
log C0 is the average common logarithm for the number of bacteria obtained from three test samples of control fabric after immediately after inoculation
log Tt is the average common logarithm for the number of bacteria obtained from three antibacterial-treated test samples after an 18 h to 24 h incubation
log T0 is the average common logarithm for the number of bacteria obtained from three antibacterial-treated test samples immediately after inoculation

Assessment of antibacterial efficiency (ČSN EN ISO 20743, Annex F):
Significant: $2 \leq A < 3$
Heavy: $A \geq 3$

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Results				
Name of test bacteria (strain number)	*Staphylococcus aureus* (CCM 4516)		*Klebsiella pneumoniae* (CCM 8853)	
Concentration of inoculum (CFU/ml)	1.0×10^5		1.1×10^5	
Difference of extremes for three control fabrics (log)	0 h	24 h	0 h	24 h
	0.17	0.01	0.21	0.06
Growth value of F	2.90		3.83	
Growth value of G	-2.95		-0.21	
Antibacterial activity value A	**5.85**		**4.04**	
Quantitative method of measuring	method of counting colonies			
Sterilization method	dry heat sterilization (105 °C, 3 h)			
Incubation time	24 h			

Determination of the effect of antibacterial finishes by culture method
was determined according to AATCC Test Method 100.

Used bacteria (cultures delivered from Czech collection of Microorganisms):

CCM 8853 = ATCC 4352	*Klebsiella pneumoniae*
CCM 4516 = ATCC 6538	*Staphylococcus aureus*

Conditions of assessment:

- mass of samples: (1.0 ± 0.1) g
- number of samples for each used germ: 6 untreated references, 6 treated test specimens
- sterilization of test samples: dry heat sterilization (105 °C, 3 h)
- concentration of testing inoculum: *K. pneumoniae* 1.1×10^5 CFU/ml, *S. aureus* 1.0×10^5 CFU/ml
- medium for inoculum preparation: nutrient broth 1:20
- neutralization medium: tryptone water
- dilution medium: tryptone water
- inoculated volume on test specimens: 1 ml
- influence time of microorganisms on test specimens: 24 h
- temperature in incubator: (37 ± 2) °C
- agar: Plate count agar (PCA)
- incubation time of Petri dishes: 24 h

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Results:
Percent reduction R of bacteria calculated by following formula:

$$R = 100(B - A)/B,$$

where
R … % reduction
A … arithmetic average of three numbers of bacteria recovered from the inoculated treated test specimen incubated over desired contact period (24 h)
B … arithmetic average of three numbers of bacteria recovered from the untreated references incubated over desired contact period (24 h)

Test Bacteria	Bacterial reduction R (%)	Uncertainty of the measurement (%)
Klebsiella pneumoniae CCM 8853	**99.97**	0.02
Staphylococcus aureus CCM 4516	**100**	0.00

Approved by:

Pavla Jarmičová
Head of the microbiological laboratory

End of report

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