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Test Requested	Determination of antibacterial activity of textile products according to ISO 20743:2021 (Absorption method)		
Sample Description			Number Received
	Trevira CS treated with NordShield BioLayr	Treated	1
	Untreated control	Non-treated	1
Date of Receipt	21 June 2023		
ASC Code	ASC004407		
Commencement Date	05 July 2023		
Report Number	C568		
Report Date	07 July 2023		

1. Purpose

To determine, as per the standard ISO 20743:2021 [1], the antibacterial activity of a textile product against *Klebsiella pneumoniae* after 24 h incubation.

2. Sample Description

Table 2.1. Description of samples		
	Test (treated) specimens	Control (non-treated) fabric
Type	Trevira CS treated with NordShield BioLayr Supplied by Ludvig Svensson	Untreated control Supplied by Ludvig Svensson
Weight	0.4 g ± 0.05g	0.4 g ± 0.05g
Shape	Square	Square

3. Procedure

The procedure was performed according to ISO 20743:2021 [1] and under the conditions summarised in Table 3.1.

Table 3.1. Test set-up details		
ISO 20743 methods used	Inoculation method	absorption method <i>(test bacterial suspension inoculated directly onto specimens)</i>
	Quantitative measurement method	colony plate count method
Test bacteria suspension	Name of test bacteria	<i>Klebsiella pneumoniae</i>
	Strain number	ATCC 4352
	Quantity inoculated	0.2 ml
	Concentration of inoculum	2.45 x 10 ⁵ CFU/ml
Incubation time		24 h
Volume of sample plated		1 ml

4. Results

4.1. Antibacterial activity (A) calculation

The logarithmic values of the number of viable bacteria (colony forming units per millilitre) recovered from the specimens immediately after inoculation and after 24 hours of incubation are summarised in Table 4.1. All calculations were performed according to the formulae in ISO 20743:2021 [1].

Table 4.1. Summary of Results for 24 h <i>K. pneumoniae</i>		
Sample		Log ₁₀ values
the common logarithm of arithmetic average of the numbers of bacteria obtained from three control specimens after incubation	$\lg C_t$	9.3
the common logarithm of arithmetic average of the numbers of bacteria obtained from three control specimens immediately after inoculation	$\lg C_0$	5.7
the common logarithm of arithmetic average of the numbers of bacteria obtained from three antibacterial test specimens after incubation	$\lg T_t$	2.3
the common logarithm of arithmetic average of the numbers of bacteria obtained from three antibacterial test specimens immediately after inoculation	$\lg T_0$	3.1

F	<i>the growth value on the control fabric</i> $(\lg C_t - \lg C_0)$	=	3.6
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G	<i>the growth value on the test fabric</i> $(\lg T_t - \lg T_0)$	=	-0.8
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A	<i>the antibacterial activity value</i> $(F-G)$	=	4.4
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The **antibacterial activity (A)** refers to the activity of an antibacterial finish used to prevent or mitigate the growth of bacteria, to reduce the number of bacteria, or to kill bacteria. It is calculated as the difference, after inoculation and incubation, in the log number of viable bacteria recovered from the antibacterial-treated product versus the number recovered from the untreated control fabric.

According to ISO 20743:2021 [1], the efficacy of antibacterial property of the test fabric can be considered as shown in Table 4.2.

Table 4.2 Efficacy of antibacterial property	
Efficacy of antibacterial property	Antibacterial activity A
Significant	≥2 to <3
Strong	≥3

4.2. Judgement of test effectiveness

When the conditions specified in ISO 20743:2021 [1] and summarised in Table 4.3 are satisfied, the test is judged to be effective. When the test is judged to be ineffective, a retest shall be carried out.

Table 4.3. Judgement of ISO 20743 test effectiveness			
Condition	Requirement	Result	Criteria Met
Test inoculum concentration	1E+05 to 3E+05	2.45E+05	Yes
The difference (in common logarithm) in extremes of the number of bacteria for the three <i>control specimens</i> immediately after inoculation and after incubation	<1	0.10 and 0.09	Yes
The growth value obtained in the plate count method	≥1	3.59	Yes
The difference (in common logarithm) in extremes of the number of bacteria for the three <i>test specimens</i> immediately after inoculation and after incubation	<2	0.23 and 0.00	Yes

5. References

- [1]. BS ISO 20743:2021 Textiles – Determination of antibacterial activity of textile products.

