

Sentec Internstional BV

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The Netherlands

Hengelo (ov), 16-2-2023

<b>Test Specimen:</b>	<b>Specimen:</b>	<b>Colour:</b>	<b>Client reference number:</b>
	A.	-	Desardi Classic- Vinyl wallcovering with non-woven backing.

<b>Examination:</b>	<b>Test number:</b>	<b>Test Name:</b>
	1.	Determination of the antibacterial activity of antibacterial finished products. Staphylococcus aureus.
	2.	Determination of the antibacterial activity of antibacterial finished products. Klebsiella pneumoniae.

**Results:** See following pages

  
Laboratory Quality Control

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**Test** : 1. Textiles – Determination of the antibacterial activity of antibacterial finished products.

**Norm** : ISO 20743

**Test Germ** : Staphylococcus aureus DSM 799 / ATCC 6538

#### Declaration on Quality Assurance

This investigation was performed and supervised according to the standard operating procedure "SOP to ISO 20743" (SOP 5.6 from 07.03.2011) by Textile Lab. The laboratory and process are continually monitored by independent, external authorities, as well as by internal audits.

#### Test description

Anti-bacterial activity is determined based on ISO 20743. The germs are removed using ultrasound and vortex devices. Also they were not poured into agar, as written in the ISO, but plated onto ready Plate-Count-Agar.

During the test, the germ-solution ( $1 - 3 \times 10^5$  / ml) is applied directly to the test sample (0,40g). Immediately after inoculation, the bacteria are separated from the sample surfaces of one set of samples (reference and equipped sample) using ultrasound and vortex devices and the number of viable germs (CFU – colony-forming units) is determined by plating ( $t_0$  value).

An additional set of reference and sample material is simultaneously inoculated and further incubated in a damp environment at 37°C. After a defined time period (typically 24 hours), the bacteria are separated from the sample surfaces using ultrasound and vortexing devices and the number of viable germs is determined by plating ( $t_{24}$  value).

In comparison to DIN EN ISO 20743, the test germs are recovered, stored and used according to an internal SOP. For generation of the inoculum, a liquid culture is inoculated from a freshly cultivated plate and cultivated for 2 to 4 hours. The samples are inoculated in sterile petri dishes and incubated in a damp environment. The separating of the bacteria from the samples is executed by additional ultra sound treatment. The bacteria are enumerated by plating. Additional customer- and test-specific variations are given on page

#### Assessment of antimicrobial activity

The assessment of antimicrobial efficacy of the antimicrobial sample in comparison to the respective reference is performed according to DIN EN ISO 20743 : 2013 Appendix F. For a sufficient antibacterial property, we recommend an antibacterial activity of at least 2 log.

Efficacy of the antibacterial property	Value of the antibacterial activity: A
Little	$A \leq 2$
Significant	$2 \leq A \leq 3$
Strong	$A \geq 3$

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**Test Results**

<b>Results test 1 specimen:</b>	
Test gem	<i>Staphylococcus aureus DSM 799/ATCC 6538</i> obtained from
Concentration of the Inoculum	3*10 <sup>5</sup> / ml
Quantitative Determination Method	plate counting method
Initials of the Editor	CG

	Sample name	Sample code	t <sub>0</sub> [cells/sample]			T24 [cells/sample]			Antibacterial property	
1	Untreated sample (reference)	101852301230034	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	-*	Reference*
2	Treated sample	101852301230035	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	-*	-*
3	Cotton fleece (internal reference)	101852301230036	3.0*10 <sup>5</sup>	3.3*10 <sup>5</sup>	2.9*10 <sup>5</sup>	4.0*10 <sup>5</sup>	4.0*10 <sup>5</sup>	5.0*10 <sup>5</sup>	-*	-*

**Variations and specific testing conditions:**

The test specimens were generated from the samples provided by the client.  
 A cotton fleece was included as an additional internal control.

**Interpretation of the test results:**

\* At the beginning of the test (t<sub>0</sub>) both the untreated sample (reference) and the treated sample behaved strongly antimicrobial against the test strain *Staphylococcus aureus DSM799 ATCC6538*, therefore a statement regarding the antibacterial activity of the treated sample cannot be evaluated according to DIN EN ISO 20743:2021.

<b>Results test 2 specimen:</b>	
Test gem	<i>Klebsiella pneumoniae DSM789 ATCC4352</i> obtained from DSMZ
Concentration of the Inoculum	3*10 <sup>5</sup> / ml
Quantitative Determination Method	plate counting method
Initials of the Editor	CG

	Sample name	Sample code	t <sub>0</sub> [cells/sample]			T24 [cells/sample]			Antibacterial property	
1	Untreated sample (reference)	101852301230034	9.3*10 <sup>4</sup>	7.2*10 <sup>4</sup>	7.6*10 <sup>4</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	-*	Reference*
2	Treated sample	101852301230035	3.7*10 <sup>4</sup>	2.8*10 <sup>4</sup>	1.8*10 <sup>4</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	<1.0*10 <sup>1</sup>	5.5 *	Strong *
3	Cotton fleece (internal reference)	101852301230036	2.8*10 <sup>5</sup>	3.0*10 <sup>5</sup>	3.0*10 <sup>5</sup>	3.2*10 <sup>5</sup>	2.9*10 <sup>5</sup>	3.4*10 <sup>5</sup>	-*	-*

**Variations and specific testing conditions:**

The test specimens were generated from the samples provided by the client.  
 A cotton fleece was included as an additional internal control.

**Interpretation of the test results:**

\* After 24 hours of incubation, the untreated sample (reference) behaved strongly antimicrobial against the test strain *Klebsiella pneumoniae DSM789 ATCC4352*, therefore the antibacterial activity of the treated sample is evaluated in comparison to an internal control sample (cotton fleece).

According to DIN EN ISO 20743:2021, the antibacterial efficiency of the treated sample can be rated as strong against the test strain *Klebsiella pneumoniae DSM789 ATCC4352* compared to the reference sample (cotton fleece).

  
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