

## Laboratory Report

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## Test object/Sample(s)

Cloth: **NanoTech micro** prewashed at 60°C (The sample was sent by the customer)

## Analyses

Evaluation of the capability of **NanoTech micro** prewashed at 60°C to reduce bacteria on PVC surfaces in a clean bench

### 1. Purpose of the study / Conclusion

It was the purpose of the present study to investigate **NanoTech micro cloth** prewashed at 60°C with regard to its cleaning effects in hospitals.

As it was not the purpose of cleaning in hospitals to remove ubiquitous environmental germs on a surface, but to reduce the number of (optional) pathogenic microorganisms *Pseudomonas aeruginosa* was used as test strain.

A suspension of *Pseudomonas aeruginosa* was applied onto the surface of a freshly disinfected PVC floor covering in a clean bench under standard laboratory conditions.

During this test the **NanoTech micro cloth** prewashed at 60°C shows a high reduction (99,9%) of *Pseudomonas aeruginosa*.

The results of this study thus demonstrate that under the chosen conditions, sanitation results are approaching disinfection criteria.

### 2. Materials and Methods

#### Material

Test surface: new PVC floor covering ( 60 x 120 cm), non structured  
Cloth: **NanoTech micro**, prewashed at 60°C,  
fixed to a massive plastic block (16 x 6.5 x 2.7 cm)  
Neutral cleaner: Tana Green care Neutral-Reiniger 04631  
(TANA Chemie GmbH, Mainz, Germany)  
Bacteria strains: *Pseudomonas aeruginosa* (ATCC 9027)  
Tubes 50 ml Falcon tube  
Liquified agar (pour plating method): tryptone soya agar (used at 45°C)  
Solid agar (spread plates method): tryptone soya agar

### Method

This test was performed in a clean bench under standard conditions.

#### *Test surface*

Before testing the PVC floor covering was disinfected in the clean bench.

#### *Application of bacteria onto the test surface*

The bacterial test strain *Pseudomonas aeruginosa* was applied onto the test surface as suspension. The concentration of *Pseudomonas aeruginosa* in suspension was  $1,04 \times 10^{16}$  cfu/ml (cfu = colony forming unit) for each strain. 5 ml of this bacterial suspension were applied onto 1.260 cm<sup>2</sup> yielding in  $4,13 \times 10^{13}$  cfu/cm<sup>2</sup>.

#### *Determination of bacteria from PVC surface based on EN 1174-2*

Areas of 7 x 9 cm were suspended in 15 ml 0,09 % NaCl/Tween 80 solution in a Falcon tube and shaken 20 min end to end. The bacteria concentration of the suspension was analysed using the pour plating method (mixing of the suspension with hot liquid tryptone soya agar (45°C) and plating) for low concentrations and the spread plates method (plating 100 µl of the suspension on a solid tryptone soya agar plate) for high concentrations. The agar plates were cultivated 4 days at 30°C.

#### *Cleaning procedure with the cloth*

The cloth was moistened by spraying 20 ml water with 1% neutral cleaner (without disinfectants). Then it was fixed to lab testing device consisting of a massive plastic block thereby ensuring a homogenous pressure. Then the cloth with the block was wiped once across the test surface by moving it in form of an 8 at a speed of approx. 5 cm/s based on instructions of the manufacturer.

#### *Control of disinfection*

Before application of bacteria the disinfection was controlled by suspension of 3 PVC areas of 7 x 9 cm and determination of bacteria by using the pour plating method (samples 1.1 to 1.3).

3. Results

Table 1: Bacteria (*Pseudomonas aeruginosa*) concentrations on the PVC floor covering before and after cleaning with **NanoTech micro cloth** prewashed at 60°C

The results of the measurements and analyses exclusively refer to the examined article(s).

		Bacteria concentration after disinfection Results obtained by the pour plating method		
Sample / Sample identification	Sample No.	[CFU / cm <sup>2</sup> ]	[CFU / m <sup>2</sup> ]	
PVC floor covering (control) 100224-03/	1.1	0	0	
	1.2	0	0	
	1.3	0	0	
		Bacteria concentration <u>before</u> cleaning with <b>NanoTech micro cloth</b> Results obtained by the spread plates method (plating of 100 µl of seriell dilution 1 to 10 <sup>-8</sup> )		
Sample / Sample identification	Sample No.	[CFU / cm <sup>2</sup> ]	[CFU / m <sup>2</sup> ]	
PVC floor covering 100224-03/	2.1	2,43 x 10 <sup>9</sup>	2,43 x 10 <sup>13</sup>	
	2.2	1,26 x 10 <sup>9</sup>	1,26 x 10 <sup>13</sup>	
	2.3	3,10 x 10 <sup>8</sup>	3,10 x 10 <sup>12</sup>	
		Bacteria concentration <u>after</u> cleaning <b>NanoTech micro cloth</b> Results obtained by the spread plates method (plating of 100 µl of seriell dilution 1 to 10 <sup>-8</sup> )		
Sample / Sample identification	Sample No.	[CFU / cm <sup>2</sup> ]	[CFU / m <sup>2</sup> ]	Reduction [%]
PVC floor covering 100224-03/	3.1	5,95 x 10 <sup>3</sup>	5,95 x 10 <sup>7</sup>	99,9
	3.2	4,52 x 10 <sup>3</sup>	4,52 x 10 <sup>7</sup>	99,9
	3.3	2,14 x 10 <sup>4</sup>	2,14 x 10 <sup>8</sup>	99,9

CFU = colony forming units

Note on the reduction efficiency

The efficiency of filters with regard to the reduction of bacteria was expressed as LRV (Logarithm Reduction Value) calculated as follows:

LRV = log (CFU of the unfiltered solution / CFU of the filtrate).

Using the LRV calculation for the test cloth *NanoTech micro* gives following results: LRV = 6, LRV = 5, LRV = 4.



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