

UMWELTLABOR ACB

Gesellschaft mit beschränkter Haftung

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3M Deutschland GmbH
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Carl-Schulz-Str. 1

41453 Neuss

Ihre Zeichen/Ihre Nachricht vom

Unsere Zeichen/Unsere Nachricht vom
42468pxs, UM/um

Datum
27.09.2006

Project: DI-NOC™ Films, antimicrobial finish
Lab. No. 42468pxs
Arrival: 15.08.2006

Dear Ladies and Gentlemen,

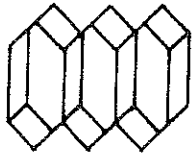
enclosed you will find the results of the examination of the 3M product sample that arrived on 15.08.2006 at our laboratory.

If there remain any questions, feel free to contact us via e-mail or phone.

Best regards

Dr. U. Maier

Umweltlabor ACB Albrecht Thaer Str. 14 48 147 Münster Telefon 0251/2852-0 Telefax 0251/2301045
Die Veröffentlichung unserer Prüfberichte und Gutachten zu Werbezwecken sowie deren auszugsweise
Verwendung in sonstigen Fällen bedürfen unserer schriftlichen Genehmigung.



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Material: DI-NOC™ Film
Lab. No.: 42468pxs

Bacteriological Results (ASTM E 2180-01)

The specimen was examined following the standard test method ASTM E 2180-01 "Determining the activity of incorporated antimicrobial agents in polymeric or hydrophobic materials".

Test strains were:

Staphylococcus aureus (ATCC 6538)

Pseudomonas aeruginosa (ATCC 9027)

grown in over night culture in CASO bouillon to 10^8 cfu/ml.

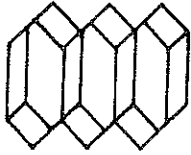
The agar slurry was inoculated with 10^6 and 10^3 cfu/ml of each test strain. 1ml of agar slurry was incubated on the specimen surface for 0h or for 24h at 37°C in a humidified atmosphere. As a negative control agar slurry on a sterile cover of a specimen cup was used.

After incubation the micro organisms were recovered by vortexing and sonication from the slurry in 20ml of 0,9% NaCl-solution. The total viable count was determined using the plate pouring method with Caso-agar. Plates for determination of total viable count were incubated for 3 days at 37°C.

Test strain: Staphylococcus aureus ATCC 6538

incubation time	Surface	cfu of inoculum	total viable count
0h	DI-NOC™ Film	10^3	$6,9 * 10^2$
24h	DI-NOC™ Film	10^3	20
24h	negative control	10^3	$> 1 * 10^5$
0h	DI-NOC™ Film	10^6	$3 * 10^2$
24h	DI-NOC™ Film	10^6	$5,7 * 10^5$
24h	negative control	10^6	$5,3 * 10^4$

cfu = colony forming unit



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Test strain: Pseudomonas aeruginosa ATCC 9027

incubation time	Surface	cfu of inoculum	total viable count
0h	DI-NOC™ Film	10^3	$1,6 * 10^2$
24h	DI-NOC™ Film	10^3	$> 1 * 10^5$
24h	negative control	10^3	$> 1 * 10^5$
0h	DI-NOC™ Film	10^6	$5,1 * 10^4$
24h	DI-NOC™ Film	10^6	$6 * 10^6$
24h	negative control	10^6	$4,2 * 10^6$

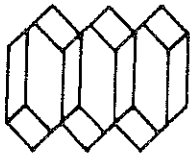
cfu = colony forming unit

Comments:

The approach 24h on DI-NOC™-surface has been done in duplicate, the values in the result tables are the statistical average. Values of total viable count are without consideration of the primary dilution for recovery of germs from slurry.

Conclusion:

A reduction of microbial growth on a DI-NOC™-surface caused by antimicrobial agents in the material could not be observed using method ASTM E 2180-01 with the test strains St. aureus and Ps. aeruginosa.



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Bacteriological Results after surface contamination

A disinfected area of 400cm² of the specimen was contaminated by spreading 10⁴ cfu of a test strain on the surface. Neglecting the loss resulting from bacteria remaining on the swab the surface should be contaminated with 25cfu/cm². Bacteria count on the surface was determined using RODAC plates with TSA-agar with disinhibitor.

RODAC specimen were taken after 0, 1 and 4 days, at 0 and 4 days a second sample was taken after disinfection of the surface with Desderman N (Schuelke & Mayr GmbH). Contaminated specimen was stored in non-sterile environment at room temperature.

Test strains were:

Staphylococcus aureus (ATCC 6538)

Escherichia coli (ATCC 8739)

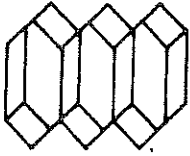
grown in over night culture in CASO bouillon to 10⁸ cfu/ml. A dilution of the strains in 0,9% NaCl-solution was used.

Time	Disinfection	cfu/25cm ² St. aureus	cfu/25cm ² E. coli
0 days	no	21 St. aureus	39 E. coli, 4 other germs
0 days	Desderman N	2	0
1 day	no	25 St. aureus. 32 other germs	43 E. coli, 38 other germs
4 days	no	17 St. aureus. 11 other germs	21 E. coli, 40 other germs
4 days	Desderman N	2	1

Bacteria on RODAC plates were identified by subculture on selective agars.

Conclusion:

A reproduction of the test strains on the surface of the film could not be observed. The increase of total viable count from day zero to day four is caused by airborne germs. Disinfection of the surface led to a effective reduction of the microbial contamination.



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Comments:

Even if the surface of the 3M product DI-NOC™-Film is not coated with an antimicrobial finish, it fulfils the requirements of a surface in a hygienic critical environment like hospitals, nursing homes or food production.

Following the recommendations of the German Commission for Hospital Hygiene and Infection Prevention at the Robert-Koch-Institute, published in Bundesgesundheitsblatt 2004 47:51-61, the requirements for a surface in a hospital environment are:

1. The surface must be glazed
2. The surface must be easy to wipe
3. The surface may not have splices
4. The surface must be disinfected with common disinfectants in required concentrations.

If the installation is done with professional care following the recommendations of the manufacturer, DI-NOC™-Film meets all four requirements.

The results of the test contamination shows that the surface is easy to sanitize with a disinfectant based on ethanol and biphenylol (Desderman N). If a surface coated with DI-NOC™-film is included in a routine cleaning plan with the use of a disinfectant, for example in a hospital or food production, the long-term stability of the surface against chemical components in the disinfectant should be proofed.


Dr. U. Maier