

**NANOSHIELD SURFACE COATING PROTECTION COMBINATION WITH CLEANING PRODUCT
 CLEANER FOR REMOVAL BACTERIAL CONTAMINATION**



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Introduction:

NANOSHIELD (Nanosystem s.r.o) is a nanotechnology products for surface protection, especially for concrete surfaces, interior and exterior plaster, painted and unpainted metals, glass, natural and synthetic textiles, ceramics and plastics. Combination with cleaning product Cleaner (Nanosystem s.r.o.) inhibited bacteria and destroyed its molecular structure by disrupting the membrane of their cells. It has high cleaning and antibacterial properties. There is no need to use gloves or other protective equipment due to its natural composition.

Methods:

We performed monitoring of bacterial contamination in a public toilet using an ATP bioluminescence assay (3M). We compared bacterial contamination on NANOSHIELD treated surface cleaned with CLEANER and surface without NANOSHIELD cleaned with traditional cleaning products. Statistical analyses were performed using R-project and P<0, 05 were considered significant.

Table 1: Monitoring of bacterial contamination on NANOSHIELD treated surface cleaned with CLEANER and surface without NANOSHIELD cleaned with traditional cleaning products

Results:

- NANOSHIELD was applicate on different surface in public toilet (button flushing, toilet seat, interior door handle on the toilet, faucets, flush).
- Median RLU on surfaces in public toilet treated with NANOSHIELD cleaned with CLEANER was significant lower (P<0,05) than surface without NANOSHIELD cleaned with common cleaning products [80 RLU (IQR=101 – 1569) vs. 2325 RLU (IQR = 1481 – 8483); P<0,05].

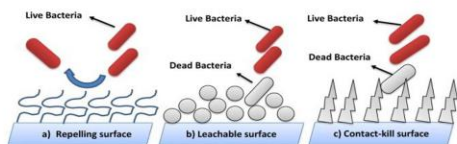


Figure 1: Classification of antibacterial surfaces (a) surfaces that resist bacteria attachment (b) surfaces treated with leaching antibacterial agents (c) contact-killing surfaces¹.



Figure 2 : Measurement procedure on different surface in public toilet

Sample	A: NANOSHIELD treated surface cleaned with CLEANER		B: Surface without NANOSHIELD cleaned with traditional cleaning products	
	Sampling site A (first floor)	Amount RLU/after application of NANOSHIELD and cleaned with CLEANER	Sampling site B (second floor)	Amount RLU/after cleaning with common cleaning agents
Nr.1	Button flushing (toilet left)	42	Button flushing (toilet right)	69
Nr. 2	Faucet (left)	203	Faucet (right)	872
Nr. 3	Toilet seat	80	Toilet seat	2325
Nr. 4	Interior door handle on the toilet	60	Interior door handle on the toilet	1200

Conclusion:

Designing antibacterial surfaces has become extremely important to minimize Healthcare Associated Infections which are a major cause of mortality worldwide. On the basis of the measurements ATP, surfaces treated with NANOSHIELD plus CLEANER have significant lower bacterial contamination than surface without NANOSHIELD cleaned with common products. Further studies are necessary to assess the effect this products on microbial contamination of environment, especially in health care setting.

Reference:

Kaur, Rajbir, Liu, Song, 2016. Antibacterial surface design – Contact kill. In Progress in Surface Science. Volume 91, Issue 3, August 2016, Pages 136-153. ISSN: 0079-6816. <http://dx.doi.org/10.1016/j.progsurf.2016.09.001>

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