

## Anti-Microbial Testing Report

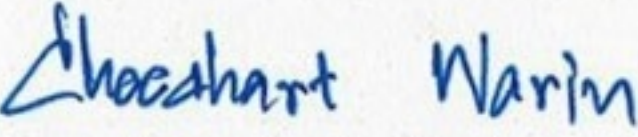
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Company: Thammasorn Nano Solution Co., Ltd.  
Address: 156/20 Petchburi Road, Rajthevi, Bangkok 10400  
Test method: Quantitative  
Test name: JIS Z 2801: 2000: Test for antimicrobial activity and efficacy  
Sample description: Polyethylene sheet  
Number of test microorganisms: 2 strain  
Test microorganisms: 1. *Escherichia coli* ATCC 25922      Inoculum size:  $4.43 \times 10^5$  CFU  
2. *Staphylococcus aureus* ATCC 6538      Inoculum size:  $1.54 \times 10^5$  CFU  
Volume of test inoculum: 100  $\mu$ l  
Number of replicate: 2  
Incubation temperature: 37  $^{\circ}$ C      Incubation time: 24 hrs.  
Test area: 3.0 x 3.0  $\text{cm}^2$   
Film type: Transparency film  
Sample cleaning: The tested surface was sterilized by UV radiation before testing  
Result:

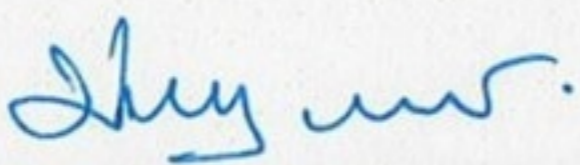
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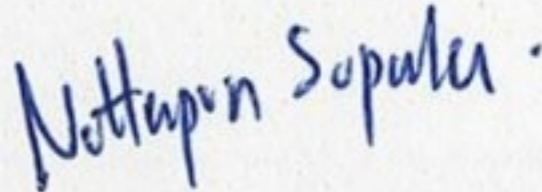
Please see results in the next page

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Date of issue: 29/09/2009  
Reference number: TS52-I0186/AM141  
Tested by   
Choochart Warin  
(Laboratory Officer)

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(Assoc.Prof. Dr. Prasert Pavasant)  
Director of NANOTECH Central Laboratory

  
(Dr. Nuttapun Supaka)  
Head of Testing and Services Laboratory

**Tested by National Nanotechnology Center**

### Disclaimer

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# Anti-Microbial Testing Report

Determination of antimicrobial activity at 24 hrs.

		Test microorganisms	
		<i>Escherichia coli</i> ATCC 25922	<i>Staphylococcus aureus</i> ATCC 6538
<b>Experimental control:</b>	PPC Transparency Film pieces		
	Number (CFU)	7.93 x 10 <sup>6</sup>	6.75 x 10 <sup>6</sup>
<b>Sample 1. POLYETHYLENE SHEET (Blank) - Control</b>			
	Number (CFU)	1.71 x 10 <sup>7</sup>	1.03 x 10 <sup>7</sup>
	Antimicrobial activity (absolute) <sup>a</sup>	UD	UD
	% Reduction (absolute) <sup>b</sup>	UD	UD
<b>Sample 2. "DOS" SILVER NANO ON POLYETHYLENE SHEET</b>			
	Number (CFU)	≤ 1.00 x 10 <sup>2</sup>	≤ 1.00 x 10 <sup>2</sup>
	Antimicrobial activity (absolute)	4.90	4.83
	% Reduction (absolute)	99.99	99.99
	Antimicrobial activity (relative) <sup>c</sup>	5.23	5.01
	% Reduction (relative) <sup>d</sup>	99.99	99.99

**Remark :** An antimicrobial product is judged to be effective when antimicrobial activity value is  $\geq 2$

Antimicrobial activity is calculated from a formula  $R = \log(B/C)$

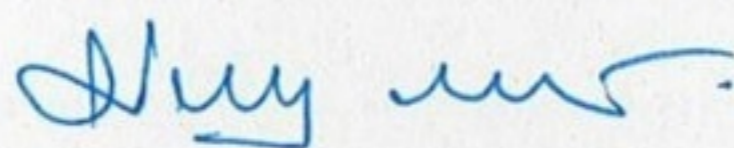
R = value of antimicrobial activity

B = average of the number of viable cells of bacteria on the untreated test piece after 24 hrs

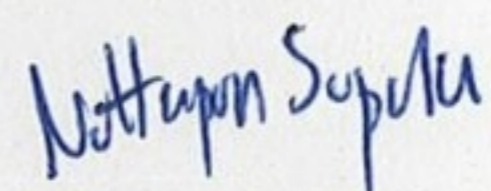
C = average of the number of viable cells of bacteria on the antimicrobial test piece after 24 hrs

- a Antimicrobial activity (absolute): calculated using experimental control after 24 hrs
- b % Reduction (absolute): calculated using experimental control after 24 hrs
- c Antimicrobial activity (relative): calculated using the untreated test piece after 24 hrs
- d % Reduction (relative): calculated using the untreated test piece after 24 hrs

**UD: Undetermined,** The control specimens already have antimicrobial activity against the test organism. Negative value means there is no antimicrobial activities in the sample



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