



July 31, 2019

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Orplast Spółka z ograniczoną odpowiedzialnością sp. k.  
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**Antimicrobial Assessment of One Sample**

**3512775**

One PP lunch box sample, treated with Ultra-Fresh CA-16, was received from Orplast Spółka z ograniczoną odpowiedzialnością sp. k. on July 18, 2019. At Thomson Research Associates, Inc., the samples were tested for antibacterial activity using a quantitative test method.

**PROCEDURE**

**Quantitative Antibacterial Assessment:**

ISO 22196:2011 was used to quantitatively test the specimen for antibacterial activity. In brief:

1. The sample was placed into a container with a lid.
2. A 0.3 mL inoculum of *Escherichia coli* (ATCC #8739) or *Staphylococcus aureus* (ATCC #6538) was placed, in microdroplets, on the surface of the samples. Sterile films were placed over the inoculum to encourage good contact.
3. The specimen was incubated 24 hours at 37C.
4. 20 mL of Letheen broth was added to the container and shook. The liquid was plated using dilution techniques.
5. The “Value of Antimicrobial Activity” was carried out using the formula

$$R = [\log (B/C)]$$

Where:

R= value of antimicrobial activity

B = Average of the number of viable cells of bacteria on the untreated test piece after 24 hours

C = Average of the number of viable cells of bacteria on the antimicrobial test piece after 24 hours.

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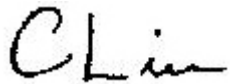
Ultra-Fresh is a registered trademark of Thomson Research Associates, Inc.

**RESULTS**

Quantitative Assessment of Activity - ISO 22196:2011					
<i>E. coli</i>					
Concentration of starting inoculum			2.02 x 10 <sup>5</sup>		
Sample Description		No. Bacteria Recovered	Log Value	R = [log(B/C)]	% Reduction
1	Nanobox PP sample treated with Ultra-Fresh CA-16	2.23 x 10 <sup>2</sup>	2.3	5.0	>99.9%
Inoculum Control		2.08 x 10 <sup>7</sup>	7.3	---	---

Quantitative Assessment of Activity - ISO 22196:2011					
<i>S. aureus</i>					
Concentration of starting inoculum			2.06 x 10 <sup>5</sup>		
Sample Description		No. Bacteria Recovered	Log Value	R = [log(B/C)]	% Reduction
1	Nanobox PP sample treated with Ultra-Fresh CA-16	1.94 x 10 <sup>4</sup>	4.3	0.9	88.9%
Inoculum Control		1.74 x 10 <sup>5</sup>	5.2	---	---

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Microbiology Manager



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c: Michal Stasiak