

# Honeywell Building Technologies

## TEST REPORT

**SCOPE OF WORK**

JIS Z 2801/ISO 22196:2011 - Measurement of antibacterial activity on plastics and other non-porous surfaces

**Product:** Peha STANDARD (UREA (Ref L) 371

**REPORT NUMBER**

104428330COL-001

**ISSUE DATE**

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**MICROBIOLOGICAL PERFORMANCE TEST REPORT**

<b>Client</b>		<b>Honeywell Building Technologies The Arnold Centre, Paycocke Road, Basildon, SS14 3EA</b>
<b>Project No.</b>		<b>G104428330</b>
<b>Sample</b>	<b>Product / Model</b>	Peha STANDARD (UREA (Ref L) 371
	<b>Identification No.</b>	COL2007021108-001
	<b>Date Received</b>	August 12, 2020
	<b>Condition</b>	Good
	<b>Production or Prototype</b>	Production
<b>Procedural</b>	<b>Tested By</b>	Nicholas Unger
	<b>Reviewer</b>	Lee Moomaw
	<b>Dates Tested</b>	09-07-2020 to 10-19-2020
	<b>Report Date</b>	10-26-2020
<b>Standard</b>	JIS Z 2801/ISO 22196:2011 - Measurement of antibacterial activity on plastics and other non-porous surfaces	
<b>Deviation from Standard</b>	Additional micro-organisms added (see Test Parameter below). Samples were cut to 50mm by 50mm. Initial Viable counts taken from spectrophotometer estimates and confirmed through $U_0$ .	

**Test Parameters:**

<b>Organism</b>	<b>ATCC No</b>
Escherichia Coli	8739
Staphylococcus aureus	6538P
Listeria monocytogenes	19114
MRSA	BAA-2313
Escherichia Coli O157:H7	43888
Phi X-174	13706-B1
Salmonella enterica subsp. enteric serovar Typhimurium	13311
Klebsiella Pneumoniae	4352

<b>Test Inoculum Volume</b>	<b>Viable E. coli in Inoculum</b>	<b>Viable S. aureus in Inoculum</b>	<b>Polymer Type</b>	<b>Polymer Thickness</b>
0.4 mL	1.9 x 10 <sup>5</sup> cfu/mL	1.0 x 10 <sup>5</sup> cfu/mL	Para Film	0.127mm

<b>Viable L. monocytogenes in Inoculum</b>	<b>Viable MRSA in Inoculum</b>	<b>Viable K. Pneumonia in Inoculum</b>	<b>Viable Escherichia Coli O157:H7 in Inoculum</b>	<b>Viable S. enterica in Inoculum</b>
2.0 x 10 <sup>5</sup> cfu/mL	1.5 x 10 <sup>5</sup> cfu/mL	2.0 x 10 <sup>5</sup> cfu/mL	1.6 x 10 <sup>5</sup> cfu/mL	2.0 x 10 <sup>5</sup> cfu/mL

<b>Viable Phi. X174 in Inoculum</b>
2.0 x 10 <sup>5</sup> pfu/mL

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Test Parameter	Definition of Term
$U_0$	Is the average of the common logarithm of the number of viable bacteria, in cells/cm <sup>2</sup> recovered from the untreated test specimens immediately after inoculation.
$U_t$	Is the average of the common logarithm of the number of viable bacteria, in cells/cm <sup>2</sup> recovered from the untreated test specimens after 24 h.
$A_t$	Is the average of the common logarithm of the number of viable bacteria, in cells/cm <sup>2</sup> recovered from the treated test specimens after 24 h.
<b>Antibacterial Activity Value</b>	Is calculated utilizing the following equation: $= (U_t - U_0) - (A_t - U_0) = U_t - A_t$

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<b>E. coli O157 Results</b>	
Test Parameter	Result
<i>Initial U<sub>0</sub></i>	<b>3.94</b>
<i>24 Hr U<sub>t</sub></i>	<b>5.4</b>
<i>24 Hr A<sub>t</sub></i>	<b>1</b>
<b>Antibacterial Activity Value</b>	<b>4.4</b>
<b>Percentage Reduction</b>	<b>99.996%</b>

<b>MRSA Results</b>	
Test Parameter	Result
<i>Initial U<sub>0</sub></i>	<b>5.35</b>
<i>24 Hr U<sub>t</sub></i>	<b>5.52</b>
<i>24 Hr A<sub>t</sub></i>	<b>1</b>
<b>Antibacterial Activity Value</b>	<b>4.52</b>
<b>Percentage Reduction</b>	<b>99.997%</b>

<b>Listeria Results</b>	
Test Parameter	Result
<i>Initial U<sub>0</sub></i>	<b>4.17</b>
<i>24 Hr U<sub>t</sub></i>	<b>4.97</b>
<i>24 Hr A<sub>t</sub></i>	<b>1</b>
<b>Antibacterial Activity Value</b>	<b>3.97</b>
<b>Percentage Reduction</b>	<b>99.99%</b>

<b>E. coli Results</b>	
Test Parameter	Result
<i>Initial U<sub>0</sub></i>	<b>5.8</b>
<i>24 Hr U<sub>t</sub></i>	<b>6.17</b>
<i>24 Hr A<sub>t</sub></i>	<b>1</b>
<b>Antibacterial Activity Value</b>	<b>5.17</b>
<b>Percentage Reduction</b>	<b>99.999%</b>

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S. aureus Results	
Test Parameter	Result
<i>Initial U<sub>0</sub></i>	5.2
<i>24 Hr U<sub>t</sub></i>	5.46
<i>24 Hr A<sub>t</sub></i>	1
Antibacterial Activity Value	4.46
Percentage Reduction	99.997%

K. pneumoniae Results	
Test Parameter	Result
<i>Initial U<sub>0</sub></i>	5.38
<i>24 Hr U<sub>t</sub></i>	5.29
<i>24 Hr A<sub>t</sub></i>	0.95
Antibacterial Activity Value	4.34
Percentage Reduction	99.995%

Salmonella enterica subsp. entericaserovar Typhimurium Results	
Test Parameter	Result
<i>Initial U<sub>0</sub></i>	5.47
<i>24 Hr U<sub>t</sub></i>	5.7
<i>24 Hr A<sub>t</sub></i>	0.7
Antibacterial Activity Value	5
Percentage Reduction	99.999%

Phi-X174 Virus Results	
Test Parameter	Result
<i>Initial U<sub>0</sub></i>	6
<i>24 Hr U<sub>t</sub></i>	5.67
<i>24 Hr A<sub>t</sub></i>	1
Antibacterial Activity Value	4.67
Percentage Reduction	99.998%

**Note:** Antibacterial Activity Values are presented in Log form as per standard requirements. A value of 1.00 would equate to a 90% reduction. A 2 would be 99%, a 3 99.9% and so forth.

Date / Project Number	Engineer / Reviewer	Pages	Description of Change
November 17, 2020 G104428330	Nicholas Unger <i>NTU</i> Lee Moomaw <i>LMM</i>	All	Changed Product name from "Peha UREA (Ref L) – 371" to "Peha STANDARD (UREA (Ref L) 371"

Test Performed by:

*Signature on File*

Nicholas Unger  
Staff Engineer  
Columbus Office

Report Approved by:

*Signature on File*

Lee Moomaw  
Engineering Team Lead  
Columbus Office