

# TEST REPORT: 7191067907-CHM13-01A-LYP

Date: 04 SEP 2013

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Client's Ref:

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## **SUBJECT**

Antimicrobial Testing Evaluation

## **CLIENT**

Greenply Industries Limited  
1503 Narain Manzil  
23 Barakhamba Road  
New Delhi  
India 110001

Attn : Mr. Gautam Ganguly

## **SAMPLE SUBMISSION DATE/ TEST DATE**

04 Jun 2013 / 04 Jun 2013

## **DESCRIPTION OF SAMPLE**

1 sample consisting of 84 pieces of coated polycarbonate panels (Dimension: 50mm x 50mm) and 84 pieces of uncoated polycarbonate panels as follows:

Greenlam Safeguard Plus Anti Bacterial Compact Laminates / High Pressure Laminates

## **METHOD OF TEST**

JIS Z 2801 : 2000

"Antimicrobial products – Test for antimicrobial activity and efficacy".

The test microorganisms used were :

*Staphylococcus aureus* (ATCC 6538P)

*Escherichia coli* (ATCC 8739)

*Haemophilus influenza* (ATCC 10211)

*Staphylococcus epidermidis* (ATCC 12228)

*Klebsiella pneumoniae* (ATCC 4352)

*Salmonella typhimurium* (ATCC 14028)

*Staphylococcus aureus subsp. aureus* (ATCC 6538)

Methicillin-resistant *Staphylococcus aureus* (NCTC 12493)

*Enterococcus faecalis* (ATCC 29212)

*Streptococcus pneumoniae* (ATCC 10015)



TÜV SÜD PSB

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## RESULTS

Test microorganism (Bacterial cells inoculated per test piece)	Average of the number of viable cells of test microorganism per test piece		Value of Antimicrobial Activity (Criteria : Not less than 2.0)
	0 hour	24 hours	
<b><i>Staphylococcus aureus</i> (ATCC 6538P)</b> <b>(1.3 x 10<sup>6</sup> cells)</b>			
Blank Polycarbonate Panel (Control)	740 000	7 700 000	-
Greenlam Safeguard Plus Anti Bacterial Compact Laminates / High Pressure Laminates	-	Less than 10	More than 5.89

Test microorganism (Bacterial cells inoculated per test piece)	Average of the number of viable cells of test microorganism per test piece		Value of Antimicrobial Activity (Criteria : Not less than 2.0)
	0 hour	24 hours	
<b><i>Escherichia coli</i> (ATCC 8739)</b> <b>(3.0 x 10<sup>5</sup> cells)</b>			
Blank Polycarbonate Panel (Control)	430 000	73 000 000	-
Greenlam Safeguard Plus Anti Bacterial Compact Laminates / High Pressure Laminates	-	200 000	2.56

Test microorganism (Bacterial cells inoculated per test piece)	Average of the number of viable cells of test microorganism per test piece		Value of Antimicrobial Activity (Criteria : Not less than 2.0)
	0 hour	24 hours	
<b><i>Staphylococcus aureus subs. aureus</i></b> <b>(ATCC 6538) (4.8 x 10<sup>5</sup> cells)</b>			
Blank Polycarbonate Panel (Control)	760 000	7 200 000	-
Greenlam Safeguard Plus Anti Bacterial Compact Laminates / High Pressure Laminates	-	Less than 10	More than 5.86

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## RESULTS (Cont)

Test microorganism (Bacterial cells inoculated per test piece)	Average of the number of viable cells of test microorganism per test piece		Value of Antimicrobial Activity (Criteria : Not less than 2.0)
	0 hour	24 hours	
<b><i>Salmonella typhimurium</i> (ATCC 14028)</b> <b>(5.6 x 10<sup>5</sup> cells)</b>			
Blank Polycarbonate Panel (Control)	730 000	1 500 000	-
Greenlam Safeguard Plus Anti Bacterial Compact Laminates / High Pressure Laminates	-	9 600	2.19

Test microorganism (Bacterial cells inoculated per test piece)	Average of the number of viable cells of test microorganism per test piece		Value of Antimicrobial Activity (Criteria : Not less than 2.0)
	0 hour	24 hours	
<b><i>Klebsiella pneumoniae</i> (ATCC 4352)</b> <b>(1.8 x 10<sup>5</sup> cells)</b>			
Blank Polycarbonate Panel (Control)	70 000	800 000	-
Greenlam Safeguard Plus Anti Bacterial Compact Laminates / High Pressure Laminates	-	Less than 10	More than 4.90

Test microorganism (Bacterial cells inoculated per test piece)	Average of the number of viable cells of test microorganism per test piece		Value of Antimicrobial Activity (Criteria : Not less than 2.0)
	0 hour	24 hours	
<b><i>Staphylococcus epidermidis</i> (ATCC 12228)</b> <b>(5.8 x 10<sup>4</sup> cells)</b>			
Blank Polycarbonate Panel (Control)	150 000	530 000	-
Greenlam Safeguard Plus Anti Bacterial Compact Laminates / High Pressure Laminates	-	Less than 10	More than 4.72

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## RESULTS (Cont)

Test microorganism (Bacterial cells inoculated per test piece)	Average of the number of viable cells of test microorganism per test piece		Value of Antimicrobial Activity (Criteria : Not less than 2.0)
	0 hour	24 hours	
<b>Methicilin-resistant <i>Staphylococcus aureus</i> (NCTC 12493) (5.6 x 10<sup>5</sup> cells)</b>			
Blank Polycarbonate Panel (Control)	140 000	200 000	-
Greenlam Safeguard Plus Anti Bacterial Compact Laminates / High Pressure Laminates	-	Less than 10	More than 4.30

Test microorganism (Bacterial cells inoculated per test piece)	Average of the number of viable cells of test microorganism per test piece		Value of Antimicrobial Activity (Criteria : Not less than 2.0)
	0 hour	24 hours	
<b><i>Enterococcus faecalis</i> (ATCC 29212) (9.2 x 10<sup>5</sup> cells)</b>			
Blank Polycarbonate Panel (Control)	1 700 000	760 000	-
Greenlam Safeguard Plus Anti Bacterial Compact Laminates / High Pressure Laminates	-	Less than 10	More than 4.88

Test microorganism (Bacterial cells inoculated per test piece)	Average of the number of viable cells of test microorganism per test piece		Value of Antimicrobial Activity (Criteria : Not less than 2.0)
	0 hour	24 hours	
<b><i>Streptococcus pneumoniae</i> (ATCC 10015) (3.4 x 10<sup>5</sup> cells)</b>			
Blank Polycarbonate Panel (Control)	110 000	820 000	-
Greenlam Safeguard Plus Anti Bacterial Compact Laminates / High Pressure Laminates		Less than 10	4.91

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**RESULTS (Cont)**

Test microorganism (Bacterial cells inoculated per test piece)	Average of the number of viable cells of test microorganism per test piece		Value of Antimicrobial Activity (Criteria : Not less than 2.0)
	0 hour	24 hours	
<b><i>Haemophilus influenzae</i> (ATCC 10211)</b> <b>(3.6 x 10<sup>5</sup> cells)</b>			
Blank Polycarbonate Panel (Control)	120 000	43 000	-
Greenlam Safeguard Plus Anti Bacterial Compact Laminates / High Pressure Laminates	-	Less than 100	More than 2.63

Note :

The value of Antimicrobial Activity was calculated as log<sub>10</sub> of average of the number of viable bacterial cells on the Control after 24 hours minus the log<sub>10</sub> of average of the number of viable bacterial cells on the Sample after 24 hours.

Remarks:

The above test results relate to the sample as received.

**MS RANDY CHIN KOK FEI**  
MICROBIOLOGIST

**MRS KAM-LEONG YIN PHENG**  
PRODUCT MANAGER  
MICROBIOLOGY  
CHEMICAL & MATERIALS

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