



BIOTECH TESTING SERVICES

TEST REPORT

LAB NO. : 13390/ 1

DATE: 24/10/2017

NAME OF CUSTOMER : M/S GREENLAM INDUSTRIES LTD.,
ADDRESS : Vill. Paterh Bhonku, Panjehra PO,
The. Nalagarh, District Solan, Himachal Pradesh
Pin: 174 101, India
REFERENCE : Letter Ref. Nil dated October 16, 2017
K. Attention: Sharma GSRA
DATE OF RECEIPT : 16/10/2017
DATE OF INITIATION : 16/10/2017
DATE OF COMPLETION : 24/10/2017
SAMPLE DESCRIPTION : LAMINATE SAMPLE LABELED AS:-

Sr. No.	Design No.	Description	Other details
1.	9108 - Suede	Exterior Grade Compact Laminate	Size: 50 x 50 Mm, Thickness : 6.0 mm
Untreated – Lab Control			

Name of Test:

Evaluation of Antimicrobial Activity of Laminate specimen

Name of Test Protocol:

JIS Z 2801: 2010

Test Organisms used for evaluating Antimicrobial activity:

1. Staphylococcus aureus ATCC 6538
2. Escherichia coli ATCC 8739
3. Klebsiella pneumoniae ATCC 4352
4. Meticillin Resistant Staphylococcus aureus (MRSA) S- 129
5. Pseudomonas aeruginosa ATCC 9027
6. Salmonella typhimurium ATCC 10749
7. Streptococcus faecalis ATCC 9790
8. Enterococcus faecalis ATCC 8459
9. Candida albicans ATCC 10231

Test Conditions:

Neutraliser used : Buffered Saline with Tween 80 - 0.01 %
 Contact Time : 24 hours at 37° C
 Incubation Temperature : 37° C for Bacteria; 28° C for Fungi
 Media and Reagent : Soyabean-casein digest-agar for Bacteria; Sabouraud's dextrose agar for Fungi

RESULTS:

ANTIBACTERIAL ACTIVITY

1. Test Bacteria: Staphylococcus aureus ATCC 6538

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 1.96×10^4				Log = 4.29
Untreated: Conc. of Inoculum on untreated sample after 24 hour (B): 2.00×10^5				Log = 5.30
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
Design No.: 9108 – Suede, Exterior Grade Compact Laminate	1720	3.23	2.07	99.14

2. Test Bacteria: Escherichia coli ATCC 8739

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 1.86×10^4				Log = 4.26
Untreated: Conc. of Inoculum on untreated sample after 24 hour (B): 2.97×10^6				Log = 6.47
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
Design No.: 9108 – Suede, Exterior Grade Compact Laminate	18000	4.25	2.22	99.39

3. Test Bacteria: Klebsiella pneumoniae ATCC 4352

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 1.97×10^4				Log = 4.29
Untreated: Conc. of Inoculum on untreated sample after 24 hour (B): 4.10×10^5				Log = 5.61
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
Design No.: 9108 – Suede, Exterior Grade Compact Laminate	2100	3.32	2.29	99.48

4. Test Bacteria: Meticillin Resistant Staphylococcus aureus (MRSA) S- 129

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 1.03×10^5				Log = 5.01
Untreated: Conc. of Inoculum on untreated sample after 24 hour (B): 2.50×10^5				Log = 5.39
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
Design No.: 9108 – Suede, Exterior Grade Compact Laminate	2100	3.32	2.07	99.16

5. Test Bacteria: Pseudomonas aeruginosa ATCC 9027

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 1.51×10^4				Log = 4.17
Untreated: Conc. of Inoculum on untreated sample after 24 hour (B): 1.51×10^5				Log = 5.17
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
Design No.: 9108 – Suede, Exterior Grade Compact Laminate	1330	3.12	2.05	99.11

6. Test Bacteria: Salmonella typhimurium ATCC 10749

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 7.30×10^5				Log = 4.86
Untreated: Conc. of Inoculum on untreated sample after 24 hour (B): 3.90×10^5				Log = 5.59
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
Design No.: 9108 – Suede, Exterior Grade Compact Laminate	3100	3.49	2.10	99.20

7. Test Bacteria: Streptococcus faecalis ATCC 9790

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 1.13×10^5				Log = 4.05
Untreated: Conc. of Inoculum on untreated sample after 24 hour (B): 3.90×10^5				Log = 5.59
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
Design No.: 9108 – Suede, Exterior Grade Compact Laminate	1260	3.10	2.49	99.67

8. Test Bacteria: Enterococcus faecalis ATCC 8459

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 3.90×10^4				Log = 4.59
Untreated: Conc. of Inoculum on untreated sample after 24 hour (B): 2.30×10^5				Log = 5.36
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
Design No.: 9108 – Suede, Exterior Grade Compact Laminate	1590	3.20	2.16	99.30

9. Test Fungus: Candida albicans ATCC 10231

Quantitative Assessment of Activity - JIS Z 2801: 2010				
Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 4.50×10^4				Log = 4.65
Untreated: Conc. of Inoculum on untreated sample after 24 hour (B): 5.10×10^5				Log = 5.70
Sample Identification	No. Fungi on treated sample (C)	Log of Fungi on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
Design No.: 9108 – Suede, Exterior Grade Compact Laminate	3900	3.59	2.11	99.23

The Standard Antimicrobial value of Evaluation $R \geq 2.0$

COMMENT:

When tested as specified, laminate labeled as **Design No.: 9108 – Suede, Exterior Grade Compact Laminate**; **PASSES** the Quantitative Assessment of activity for Staphylococcus aureus, Escherichia coli, Klebsiella pneumonia, Meticillin Resistant Staphylococcus aureus, Pseudomonas aeruginosa, Salmonella typhimurium, Streptococcus faecalis, Enterococcus faecalis and Candida albicans by **JIS Z 2801: 2010 Test Method**.

For BIOTECH TESTING SERVICES




Dr Shilpa U. Nair
Quality Manager
(Authorized Signatory)