

Prepared for: PEGASUS PANELS PVT LTD.



Title:

**Evaluation of Antimicrobial
Activity of Paper based
Laminate samples**

Date: 26th Feb 2019

Report Number: MTR/BTS/19/01/01

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Table of Contents

1 Objectives.....	2
2 Background	2
3 Customer Details	2
4 Samples	2
5 Method & Results.....	3
5.1 Methods	3
5.2. RESULTS	6
6 Discussion	8
7 LONZA Contacts	9

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1 Objectives

To evaluate the Antimicrobial activity (Anti-bacterial & Anti-fungal) of Paper based Laminate samples by Dorby Mica preserved with Dantoserve SG.

2 Background

The customer manufactures the laminates. They have incorporated our Dantoserve SG and want to do a bacterial and fungal test before they launch this product into the market.

3 Customer Details

Name of the Customer — PEGASUS PANELS PVT LTD. (DORBY MICA)

4 Samples

The following samples were received:

Paper based laminate (paper +Resin) -

Sr.no.	Samples	Treatment	Remarks
1	Laminate Sample A (Dorby Mica)	Treated with Preservative Dantoserve SG	Only bottom white surface to be tested for bacteria and fungus.
2	Laminate Sample B (Dorby Mica)	Treated with Preservative Dantoserve SG	
3	Laminate Sample -- Blank (Dorby Mica)	Untreated	

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5 Method & Results

5.1 Methods

5.1.1 Antibacterial Activity

Name of Test:

Evaluation of Antimicrobial Activity of Laminate specimen

Test Standard:

ISO 22196 - 2011

Test Organisms used:

1. *Escherichia coli* ATCC 8739
2. *Staphylococcus aureus* ATCC 6538

Test Conditions:

Neutralizer used : Buffered Saline with Tween 80 - 0.01 %
Contact Time : 24 hours at 37⁰ C
Incubation Temperature : 37° C for Bacteria
Media and Reagent : Soyabean-casein digest agar

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5.1.2 Anti fungal Activity

Name of Test:

Determine Fungus Resistance property of Polymeric materials to Fungi.

Test Standard:

ASTM: G 21-15

Test specimen Size:

50 mm x 50 mm

Experimental Conditions:

Temperature : 28°C ± 1°C

Humidity : >85% Relative Humidity

Duration of Exposure : 28 days

Test Organisms used:

Mixed spore suspension of —

1. *Aspergillus niger* ATCC 9642
2. *Penicillium funicolosum* ATCC 11797
3. *Gliocladium vixens* ATCC 9645
4. *Chaetobium globosum* ATCC 6205
5. *Aurobasidium pullulans* ATCC 15233

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Procedure:

Specimen materials of 50 mms x 50 mms were placed on Nutrient salt agar. Composite spore suspension was sprayed on specimen. Observations were made on weekly basis for appearance for the density of fungal growth. Adequate positive and Negative controls were also included along with specimen.

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5.2. RESULTS

5.2.1 Antibacterial Activity

1. Test Bacteria: *Escherichia coil* ATCC 8739

Quantitative Assessment of Activity - ISO 22196 – 2011				
Dorby Mica Laminate Sample - Blank: Conc. of Inoculum on untreated sample at 0 hours (A): 1.04×10^5				Log = 5.01
Dorby Mica Laminate Sample - Blank: Conc. of Inoculum on untreated sample after 24 hour (B): 8.00×10^5				Log = 5.90
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
Dorby Mica Laminate Sample A (Treated with Preservative)	<10	<1	>4.90	>99.99
Dorby Mica Laminate Sample B (Treated with Preservative)	<10	<1	>4.56	>99.99

2. Test Bacteria: *Staphylococcus aureus* ATCC 6538

Quantitative Assessment of Activity - ISO 22196 – 2011				
Dorby Mica Laminate Sample - Blank: Conc. of Inoculum on untreated sample at 0 hours (A): 1.96×10^5				Log = 5.29
Dorby Mica Laminate Sample .Blank: Conc. of Inoculum on untreated sample after 24 hour (B): 3.70×10^5				Log = 5.56
Sample Identification	No. Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
Dorby Mica Laminate Sample A (Treated with Preservative)	<10	<1	>4.56	>99.99
Dorby Mica Laminate Sample B (Treated with Preservative)	<10	<1	>4.56	>99.99

The Standard Antimicrobial value of Evaluation R > 2.0

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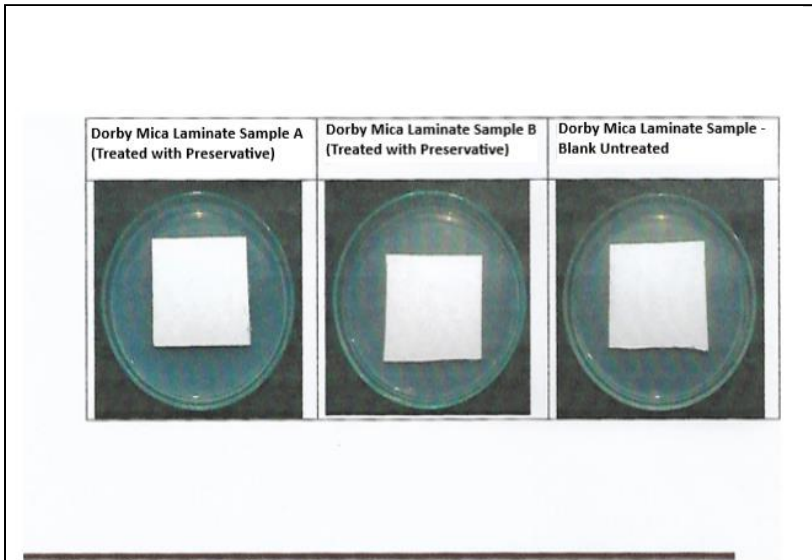
5.2.2 Anti-fungal Activity

Sample Description	Rating in Terms of Growth at 3 weeks
Dorby Mica Laminate Sample A (Treated with Preservative)	0
Dorby Mica Laminate Sample B (Treated with Preservative)	0
Dorby Mica Laminate Sample — Blank Untreated	1
Untreated — Lab Control	4

Evaluation Criteria:

Observation for Visible Effects:

Growth on Specimen	Rating
None	0
Trace of Growth (<10%)	1
Light Growth (10-30%)	2
Medium Growth (30-60%)	3
Heavy Growth (60% to complete coverage)	4



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6 Discussion

6.1. Antibacterial Activity:

When tested as specified, Sample labelled **Dorby Mica Laminate Sample A - Treated with Preservative** and **Dorby Mica Laminate Sample B - Treated with Preservative; PASSES** the Quantitative Assessment of activity for *Escherichia coli* and *Staphylococcus aureus* by 150 22196 - 2011 Test Method.

6.2. Antifungal Activity:

Sample — labelled as **Dorby Mica Laminate Sample A - Treated with Preservative** and **Dorby Mica Laminate Sample B -Treated with Preservative** are **Resistant to fungal attack; Dorby Mica Laminate Sample — Blank -Untreated is Moderately Resistant to fungal attack** at the end of 21 days of incubation when tested as per ASTM: G 21 - 2015 test method.

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7 LONZA Contacts

We trust that the information in this report is of help. The following people will be pleased to help you if you have further questions about the work that has been carried out:-

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