



# BIOTECH TESTING SERVICES

## TEST REPORT

LAB NO. : 2102019/ 1 - 2

DATE: 05/07/2021

**NAME OF MANUFACTURING UNIT:** M/S SHIRDI INDUSTRIES LTD.

**ADDRESS** : Plot No.9, Sector-01, IIE, SIDCUL, Pantnagar  
Rudrapur, Distt. Udham Singh Nagar- 263153  
Uttarakhand

**REFERENCE** : Letter Ref: Nil dated June 28, 2021  
Kind Attention: Pradeep Asati

**DATE OF RECEIPT** : 28/06/2021

**DATE OF INITIATION** : 28/06/2021

**DATE OF COMPLETION** : 05/07/2021

**SAMPLE DESCRIPTION** : Laminate Sample labeled as -

Sr. No.	Sample Code	Other details
1.	ASIS LAM Anti – Virus High Pressure Decorative Laminates Design No 1002; Finish - Suede ; Thickness - 1.00	Treated
2.	ASIS LAM High Pressure Decorative Laminates Design No 1002; Finish - Suede ; Thickness - 1.00	Untreated
Untreated lab control		

**Name of Test:**

Measurement of Antiviral activity on plastics and other non-porous surfaces and coating materials

**Name of Test Protocol:**

ISO 21702: 2019\*

**Scope of Method:**

This test specifies method for measuring antiviral activity on plastic and other non-porous surface of antiviral-treated products against specified virus. Due to individual sensitivities, the results of one test virus might not be applicable for other viruses.

\*Modified method with use of MS2 virus

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### Test Microorganism Information:

MS2 Bacteriophage (MS2) is an RNA virus of the family Leviviridae. Escherichia coli 15597 are the hosts for bacteriophages. Due to its environmental resistance, MS2 bacteriophages are used as a surrogate virus (particularly in place of Picornaviruses such as Poliovirus and human Norovirus) in water quality and Antimicrobial studies.

Virus: MS2 Bacteriophage

Permissive Host Cell: Escherichia coli ATCC 15597

### Experimental Details:

Test Carrier	: Test Sample (50 mm x 50 mm); Pre-sterilized by UV light
Control Carrier	: Sample non coated and sterilized by autoclaving (50 mm x 50 mm)
LDPE cover	: LDPE film pre sterilized 40 mm x 40 mm
Virus	: MS2 Bacteriophage; Inoculum volume 0.4 ml
Permissive Host Cell	: Escherichia coli ATCC 15597
Contact Period	: 2 hours and 24 hours
Neutralizer	: DE broth
Medium	: Trypticase soya agar
Incubation for survivors	: 37 <sup>0</sup> C for 3 days

### Validation and Records:

#### Neutralizer Validation and Records:

Validation Test			
Test Organism	Exptl. Condition Control (A) (PFU/ ml)	Neutralizer Toxicity Control (B) (PFU/ ml)	Dilution-neutralization Control (C) (PFU/ ml)
MS2 Bacteriophage	40	44	48

#### Where –

A=No. of PFU/ml of Test organism in Experimental condition validation

B=No. of PFU/ml of Test organism in Neutralizer Toxicity validation



**Test Procedure:**

Pre-sterilized samples were loaded with diluted viral suspension to  $10^6$  PFU/ ml. Virus suspension 0.4 ml was added to 50 mm x 50 mm of Test substrate. It was covered with 40 mm x 40 mm LDPE film. Following exposure time, Virus was eluted and neutralized by serial tenfold dilution and assayed to determined surviving Viruses in comparison with Control without test product in sq. cms. Virus assay was quantitative as Plaque forming unit (PFU) visible as area of Clearance.

**Results:**

**A. Contact duration of 2 hours**

Quantitative Assessment of Antiviral Activity – ISO 21702: 2019				
Untreated: Average no. of Plaques recovered at 0 hours ( $U_0$ ): $7.60 \times 10^4$ PFU/sq cm.				Log = 4.88
Untreated: Average no. of Plaques recovered at 2 hours ( $U_t$ ): $8.30 \times 10^4$ PFU/sq cm.				Log = 4.91
Sample Identification	Average No. of Plaques recovered from Treated (At)	Log of Plaques recovered from Treated (At)	Antiviral Activity (R) (Log $U_t - A_t$ )	Virus Reduction Percentage
ASIS LAM Anti – Virus High Pressure Decorative Laminates Design No 1002; Finish - Suede; Thickness - 1.00 - <b>Treated</b>	260	2.41	<b>2.50</b>	<b>99.68</b>
ASIS LAM High Pressure Decorative Laminates Design No 1002; Finish - Suede; Thickness - 1.00 - <b>Untreated</b>	2560	3.40	<b>1.51</b>	<b>96.91</b>

**B. Contact duration of 24 hours**

Quantitative Assessment of Antiviral Activity – ISO 21702: 2019				
Untreated: Average no. of Plaques recovered at 0 hours ( $U_0$ ): $7.60 \times 10^4$ PFU/sq cm.				Log = 4.88
Untreated: Average no. of Plaques recovered at 24 hours ( $U_t$ ): $8.60 \times 10^4$ PFU/sq cm.				Log = 4.93
Sample Identification	Average No. of Plaques recovered from Treated (At)	Log of Plaques recovered from Treated (At)	Antiviral Activity (R) (Log $U_t - A_t$ )	Virus Reduction Percentage
ASIS LAM Anti – Virus High Pressure Decorative Laminates Design No 1002; Finish - Suede; Thickness - 1.00 - <b>Treated</b>	<10	<1	<b>&gt;3.93</b>	<b>&gt;99.98</b>
ASIS LAM High Pressure Decorative Laminates Design No 1002; Finish - Suede; Thickness - 1.00 - <b>Untreated</b>	500	2.69	<b>2.24</b>	<b>99.41</b>

Where:

R = Antiviral activity

$U_0$  = Log of PFU recovered from Untreated specimen immediately after inoculation, in PFU/ cm<sup>2</sup>

$U_t$  = Log of PFU recovered from Untreated specimen after 2/24 hrs. after inoculation, in PFU/ cm<sup>2</sup>

$A_t$  = Log of PFU recovered from Treated specimen after 2/ 24 hrs. after inoculation, in PFU/ cm<sup>2</sup>



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### COMMENT:

When tested as specified, Sample labeled as **ASIS LAM Anti – Virus High Pressure Decorative Laminates Design No 1002; Finish:- Suede; Thickness - 1.00 - Treated** has shown **99.68%** and **>99.98%** reduction; **ASIS LAM High Pressure Decorative Laminates Design No 1002; Finish - Suede; Thickness - 1.00 - Treated** has shown **96.91%** and **99.41%** reduction of MS2 Bacteriophage as surrogate virus in 2 hours when tested by ISO 21702: 2019 standard.

### Disclaimer:

Bacteriophages are viruses of Bacteria. They are suitable only as a Preliminary screen in the development of germicidal product. Due to variation in virus antigen, for specific virucidal claims, test should be conducted specifically with that virus

For BIOTECH TESTING SERVICES



Dr Shilpa U. Nair  
Quality Manager  
(Authorized Signatory)

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