BIOTECH TESTING SERVICES

TEST REPORT

LAB NO. : 2200015/ 1	DATE: 08/01/2022

NAME OF CUSTOMER : M/S. INDIAN INSTITUTE OF SCIENCE

ADDRESS : Bangalore

REFERENCE : Letter Ref Nil dated January 03, 2022
K. Attention: Dr. Halima Khatoon

DATE OF RECEIPT : 03/01/2022

DATE OF INITIATION : 03/01/2022

DATE OF COMPLETION : 08/01/2022

SAMPLE DESCRIPTION : Steel sample labeled as -

Sr. No.	Sample Code
1.	PC - Steel
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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Email : info@biotechts.in / report@biotechts.in / biotechtestingservices@gmail.com / shilpanair@biotechts.in

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 ETO gas
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	: 24 hours
Neutralizer	: DE broth
Medium	: Trypticase soya agar
Incubation for survivors	: 37^{0}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	44	46	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

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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 24 hours

Quantitative Assessment of Antiviral Activity – ISO 21702: 2019				
Untreated: Average no. of Plaques recovered at 0 hours (U_0): 4.80 x 10^4 PFU/sq cm.				Log = 4.68
Untreated: Average no. of Plaques recovered at 24 hours (U_t): 5.40 x 10^4 PFU/sq cm.				Log = 4.73
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**
PC - Steel	<10	<1	**>3.73**	**>99.98**

Where:

R = Antiviral activity

U_0 = Log of PFU recovered from Untreated specimen immediately after inoculation, in PFU/ cm^2

U_t = Log of PFU recovered from Untreated specimen after 24 hrs. after inoculation, in PFU/ cm^2

A_t = Log of PFU recovered from Treated specimen after 24 hrs. after inoculation, in PFU/ cm^2

COMMENT:

When tested as specified, sample labeled as **PC - Steel** has shown **>99.98%** reduction of MS2 Bacteriophage as surrogate virus in 24 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

BIOTECH TESTING SERVICES BTS MUMBAI

Dr Shilpa U. Nair
Quality Manager
(Authorized Signatory)

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