



ITS LABORATORY

(An ISO 9001: 2015, ISO 14001:2015, ISO 45001:2018 Certified Laboratory)
Laboratory: A-91, Sector 80, Phase-2, Noida-201301, (U.P)
M.: 09911659800, 09958849764, 07210888634

Report Code: MS-040920-04, Page 01 of 03

TEST REPORT

FABRIC TEST

Report Code: MS-040920-04
Issued To :

Issue Date: 11/09/2020

PART A: Particulars of Sample submitted

A.	Sample Description	:	Fabric (with Spunbond) Sample ID.- NMAF01-0409-099-MP
B.	Date of Sample Received	:	04/09/2020
C.	Date of Commencement of Testing	:	04/09/2020
D.	Date of completion of Testing	:	11/09/2020
E.	Test Method	:	AATCC-100
F.	Sample submitted By	:	Customer
G.	Instrument Used	:	Breathing machine, Aerosol Generator, Pressure Probe etc.

Initial Concentration of Microbes

S. No.	Name of Test	Unit	Initial Concentration
1.	Total Bacterial Count	cfu/m ³	2.31 x 10 ⁴
2.	Total Fungal Count	cfu/m ³	3.14 x 10 ⁴
3.	MRSA	cfu/m ³	1.84 x 10 ⁴
4.	Yeast & Mold	cfu/m ³	1.76 x 10 ⁴

Test Methodology: (Petri Plate Exposure Technique)

1. Air purifier with **sample Tested in a chamber of 10ft x 10ft x 10 ft.**
2. Fan was powered during operation.
3. Petriplate having bacterial and fungal growth is exposed to air, where air purifier is running for different time period.
4. Exposed petriplate is incubated for colony forming in biological incubator.
5. After incubation period, colony of bacteria and fungus is measured by colony counter and recorded.





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Report Code: MS-040920-04, Page 2 of 3

RESULTS

1. Total Bacterial Count Reduction Rate

S. No.	Time (Hr)	Observation (cfu/m ³)	Reduction Percentage
1.	Initial	2.31 x 10 ⁴	-
2.	1	1.3 x 10 ⁴	43.72
3.	4	8.4 x 10 ³	63.64
4.	8	3.6 x 10 ³	84.41
5.	24	76	99.67

2. Total Fungal Count Reduction Rate

S. No.	Time (Hr)	Observation (cfu/m ³)	Reduction Percentage
1.	Initial	3.14 x 10 ⁴	-
2.	1	1.86 x 10 ⁴	40.76
3.	4	9.78 x 10 ³	68.85
4.	8	4.92 x 10 ³	84.33
5.	24	83	99.73

3. MRSA Count Reduction Rate

S. No.	Time (Hr)	Observation (pfu)	Reduction Percentage
1.	Initial	1.82 x 10 ⁴	-
2.	1	1.22 x 10 ⁴	32.97
3.	4	7.64 x 10 ³	58.02
4.	8	4.5 x 10 ³	75.27
5.	24	54	99.69

4. Yeast Mold Count reduction Rate

S. No.	Time (Hr)	Observation (pfu)	Reduction Percentage
1.	Initial	1.76 x 10 ⁴	-
2.	1	1.34 x 10 ⁴	23.86
3.	4	6.45 x 10 ³	63.35
4.	8	4.75 x 10 ³	73.01
5.	24	51	99.71





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Report Code: MS-040920-04, Page 3 of 3

Summary of Test:

S. No.	Name of Test	Positive Control Sample	Final Count after 24 hrs of Air Purifier	Reduction (%)
1.	Total Bacterial Count (cfu/m ³)	2.31 x 10 ⁴	76	99.67
2.	Total Fungal Count (cfu/m ³)	3.14 x 10 ⁴	83	99.73
3.	MRSA	1.82 x 10 ⁴	54	99.69
4.	Yeast & Mold	1.76 x 10 ⁴	51	99.71

Conclusions: On the basis of above tested parameters, sample having high antimicrobial activity with killing rate 99 % is recorded.

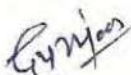
Notes: cfu : colony forming unit
pfu: plaque forming unit

Remarks:

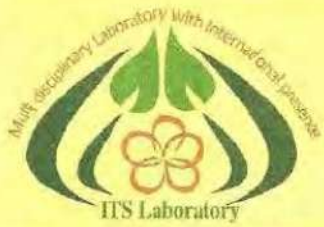
Total Bacterial Count contains micrococcus, staphylococcus, Bacillus and Pseudomonas bacteria.
Total Fungal Count contains cladosporium , Penicillium and Aspergillus Fungus.

Notes:

1. The results given above are related to the tested sample, as received & mentioned Parameters.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written Permission of the laboratory.


Checked by


Authorized Signatory



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Report Code: MS-040920-04, Page 01 of 02

TEST REPORT

FABRIC TEST

Report Code: MS-040920-04

Issue Date: 23/09/2020

Issued To

:

PART A: Particulars of Sample submitted

A.	Sample Description	:	Fabric (with Spunbond) Sample ID.- NMAF01-0409-099-MP
B.	Date of Sample Received	:	04/09/2020
C.	Date of Commencement of Testing	:	04/09/2020
D.	Date of completion of Testing	:	23/09/2020
E.	Test Method	:	ASTM F2101
F.	Sample submitted By	:	Customer
G.	Instrument Used	:	Breathing machine, Aerosol Generator, Pressure Probe etc.

Initial Concentration of Polluting Dust

S. No.	Name Of Test Dust	Unit	Initial Concentration
1.	PM2.5	PPM	984

Test Method:

1. Air Purifier **Tested in a chamber of 20ft x 10ft x 10 ft.**
2. Fan was powered during operation.
3. Concentration is monitored during operation of Air Purifier and also for Control sample without Air Purifier Operation.
4. Test Method is in below Table :

PM 2.5	CPCB Volume - 1
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Report Code: MS-040920-04, Page 02 of 02

1. PM2.5 Removal Performance			
S. No.	Time (Hr)	Observation (PPM)	Reduction Latching Percentage
1.	Initial	984	-
2.	1	547	44.41
3.	4	284	71.14
4.	8	201	79.57
5.	24	170	98.27

2. Differential Pressure					
S. No.	Test Parameter	Test Method	Unit	Result	Requirement
1.	Differential Pressure (Breathing Resistance)	EN 14683	Pa/cm ²	52	-

Notes:

1. The results given above are related to the tested sample, as received & mentioned Parameters.
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Report Code: MS-040920-04, Page 01 of 02

TEST REPORT FABRIC TEST

Report Code: MS-040920-04
Issued To :

Issue Date: 22/09/2020

PART A: Particulars of Sample submitted

A.	Sample Description	:	Fabric (with Spunbond) Sample ID.- NMAF01-0409-099-MP
B.	Date of Sample Received	:	04/09/2020
C.	Date of Commencement of Testing	:	04/09/2020
D.	Date of completion of Testing	:	22/09/2020
E.	Test Method	:	ASTM F2101
F.	Sample submitted By	:	Customer
G.	Instrument Used	:	Breathing machine, Aerosol Generator, Pressure Probe etc.

Initial Concentration of Microbes

S. No.	Name of Test	Unit	Initial Concentration
1.	Virus (Bacteriophage Virus)	pfu	1.74×10^4

Test Methodology: (Petri Plate Exposure Technique)

1. Air purifier with **filter Tested in a chamber of 10ft x 10ft x 10 ft.**
2. Fan was powered during operation.
3. Petriplate having Bacteriophage Virus exposed to air, where air purifier is running for different time period.
4. Exposed petriplate is incubated for colony forming in biological incubator.
5. After incubation period, colony of virus is measured by colony counter and recorded.





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Report Code: MS-040920-04, Page 02 of 02

RESULTS

1. Bacteriophage Virus Killing Rate			
S. No.	Time (Hr)	Observation (pfu)	Reduction Percentage
1.	Initial	1.74×10^4	-
2.	1	1.34×10^4	22.99
3.	4	2.14×10^3	87.70
4.	8	3.47×10^2	98.00
5.	24	31	99.82

Summary of Test:

S. No.	Name of Test	Positive Control Sample	Final Count after 24 hrs of Air Purifier	Reduction (%)
1.	Virus (Bacteriophage Virus) (pfu)	1.74×10^4	31	99.82

Conclusions: On the basis of above tested parameters, sample having high antimicrobial activity with killing rate 99 % is recorded.

Notes: pfu: plaque forming unit

Remarks:

Virus contains Bacteriophage Virus.

Notes:

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Report Code: MS-040920-05, Page 01 of 03

TEST REPORT

FABRIC TEST

Report Code: MS-040920-05

Issue Date: 11/09/2020

Issued To

:

PART A: Particulars of Sample submitted

A.	Sample Description	:	Fabric (with Spunbond) Sample ID.- NMAF01-0409-098-MP
B.	Date of Sample Received	:	04/09/2020
C.	Date of Commencement of Testing	:	04/09/2020
D.	Date of completion of Testing	:	11/09/2020
E.	Test Method	:	ASTM F2101
F.	Sample submitted By	:	Customer
G.	Instrument Used	:	Breathing machine, Aerosol Generator, Pressure Probe etc.

Initial Concentration of Polluting Gases

S. No.	Name Of Test Gas	Unit	Initial Concentration
1.	Benzene (ppm)	PPM	5.4
2.	Hexane (ppm)	PPM	4.0
3.	Mercaptan (ppm)	PPM	5.6
4.	Xylene (ppm)	PPM	5.0
5.	Toluene (ppm)	PPM	4.9
6.	Formaldehyde (ppm)	PPM	5.0

Test Method:

1. Air Purifier with **filter Tested in a chamber of 10ft x 10ft x 10 ft.**
2. Fan was powered during operation.
3. Concentration is monitored during operation of fabric and also for Control sample without fabric Operation.
4. Test Method is in below Table :





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Report Code: MS-290720-05, Page 2 of 3

Benzene (ppm)	IS:5182 Part-XI
Hexane (ppm)	NIOSH 1501
Mercaptan (ppm)	NIOSH 1501
Xylene (ppm)	NIOSH 1501
Toluene (ppm)	NIOSH 1501
Formaldehyde (ppm)	NIOSH 1501

RESULTS

1. Benzene Removal Performance			
S. No.	Time (Hr)	Observation (PPM)	Reduction Percentage
1.	Initial	5.4	-
2.	1	3.1	42.59
3.	4	2.0	62.96
4.	8	0.64	88.14
5.	24	0.005	99.90

2. Hexane Removal Performance			
S. No.	Time (Hr)	Observation (PPM)	Reduction Percentage
1.	Initial	4.0	-
2.	1	2.6	35.0
3.	4	1.60	60.0
4.	8	0.79	80.25
5.	24	0.0076	99.81

3. Mercaptan Removal Performance			
S. No.	Time (Hr)	Observation (PPM)	Reduction Percentage
1.	Initial	5.6	-
2.	1	3.2	42.86
3.	4	2.9	51.79
4.	8	0.92	83.57
5.	24	0.046	99.18





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Report Code: MS-290720-05, Page 3 of 3

4. Xylene Removal Performance			
S. No.	Time (Hr)	Observation (PPM)	Reduction Percentage
1.	Initial	5.0	-
2.	1	4.2	16.0
3.	4	1.6	68
4.	8	0.58	88.4
5.	24	0.062	98.75

5. Toluene Removal Performance			
S. No.	Time (Hr)	Observation (PPM)	Reduction Percentage
1.	Initial	4.9	-
2.	1	3.3	32.65
3.	4	1.45	70.41
4.	8	0.37	92.45
5.	24	0.0081	99.83

6. Formaldehyde Removal Performance			
S. No.	Time (Hr)	Observation (PPM)	Reduction Percentage
1.	Initial	5.0	-
2.	1	3.8	24.0
3.	4	2.9	42.0
4.	8	1.6	68.0
5.	24	0.09	98.20

Notes:

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3. This test report will not be generated again, either wholly or in part, without prior written Permission of the laboratory.

Gurpreet
 Checked by

V.K.Y.
 Authorized Signatory



ITS LABORATORY

(An ISO 9001: 2015, ISO 14001:2015, ISO 45001:2018 Certified Laboratory)

Laboratory: A-91, Sector 80, Phase-2, Noida-201301, (U.P)

M.: 09911659800, 09958849764, 07210888634

Report Code: MS-040920-06, Page 01 of 02

TEST REPORT

FABRIC TEST

Report Code: MS-040920-06

Issue Date: 11/09/2020

Issued To

:

PART A: Particulars of Sample submitted

A.	Sample Description	:	Fabric (with Spunbond) Sample ID.- NMAF01-0409-100-MP
B.	Date of Sample Received	:	04/09/2020
C.	Date of Commencement of Testing	:	04/09/2020
D.	Date of completion of Testing	:	11/09/2020
E.	Test Method	:	ASTM F2101
F.	Sample submitted By	:	Customer
G.	Instrument Used	:	Breathing machine, Aerosol Generator, Pressure Probe etc.

Initial Concentration of Polluting Dust

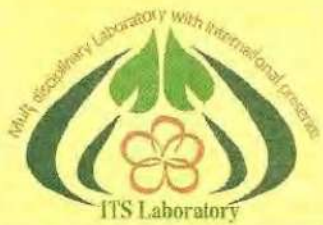
S. No.	Name Of Test Dust	Unit	Initial Concentration
2.	PM2.5	(microgram/m ³)	24
3.	PM1.0	(microgram/m ³)	6

Test Method:

1. Air Purifier with **filter Tested in a chamber of 10ft x 10ft x 10 ft.**
2. Fan was powered during operation.
3. Concentration is monitored during operation of Air Purifier and also for Control sample without Air Purifier Operation.
4. Test Method is in below Table :

PM 2.5	CPCB Volume - I
PM 1.0	Dust Monitor





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M.: 09911659800, 09958849764, 07210888634

Report Code: MS-040920-06, Page 02 of 02

1. PM2.5 Removal Performance			
S. No.	Time (Hr)	Observation (microgram/m ³)	Reduction Latching Percentage
1.	Initial	24	-
2.	1	22	0.0
3.	4	26	0.0
4.	8	25	0.0
5.	24	24	0.0

2. PM1.0 Removal Performance			
S. No.	Time (Hr)	Observation (microgram/m ³)	Reduction Latching Percentage
1.	Initial	6	-
2.	1	6	0.0
3.	4	4	0.0
4.	8	5	0.0
5.	24	6	0.0

Remarks: On the basis of above test sample has no Pm 2.5 and PM 1.0 Leaching in the Air from Filter installed in Air Purifier.

Notes:

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2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written Permission of the laboratory.

Leung
Checked by

N.K.Y.
Authorized Signatory



Himway Test House Pvt Ltd

ISO CERTIFIED/ISO ACCREDITED NABL LABORATORY

Nature of the Sample :	NM Graphene Silver Technology (NM^{G-TX})	Report No:	20092001
Customer Ref. No:	NMAF06-0409-53	Date Of Sampling :	19.09.2020
		Sample issue in Lab :	20.09.2020
		Test Started On :	20.09.2020
		Test Completed on :	23.09.2020

SAMPLING DETAILS

Sample Packing & Marking : Plastic Box.
 Sample Quantity : 100 ml

TEST RESULTS:

Modified ISO 18184:2019 Tested method of Three sample against SARS-CoV-2 (COVID-19) at One contact Time of our sample.

Test Virus	Contact Time	Sample ID	Virus Titer (TCID ₅₀ per Carrier)	Mean Virust Titer (TCID ₅₀ per Carrier)	Mean Log ₁₀ Virus Titer (TCID ₅₀ per Carrier)	Log ₁₀ Reduction	Percent Reduction
SARS-CoV-2 (COVID-19)	Time Zero	Control sample	2.31E+06	3.71E+06	7.13	N.A.	N.A.
			7.39E+06				
			1.45E+06				
	30 Min	Control sample	7.32E+05	4.79E+05	6.18	5.15	99.99% Kill Rate: 11 second (99%)
			4.52E+05				
			2.55E+05				
	30 Min	Rigid Sample-1 (Test)	2.24E+03	3.71E+05	3.98	3.25	99.57% Kill Rate: 12 second (99%)
			2.25E+03				
			2.38E+03				
			1.93E+04				
			7.29E+05				
			7.23E+03				
	2.65E+03						

* TCID₅₀ Tissue Culture Infectivity Dose at the 50% Endpoint
 * Log₁₀ and Percent Reductions for Control sample at 30Min calculated relative to Control sample immediately upon inoculation (Time Zero)
 * Log₁₀ and Percent Reduction for the three Test sample at 30 Min calculated relative to Control sample mean viral titer at 30 Min.
 * SAMPLE SIZE: DIAMETER = 4.80 +/- 0.1CM. PRE INCUBATION C : SARBOURAUD GLUCOSE AGAR. PRE INCUBATION D : SARBOURAUD GLUCOSE BROTH
 * DILUTE AGENT FOR INOCULATION: PHYSIOLOGIC SALT SOLUTION. INCUBATION: 30 DEG C. SPECIMEN PREPARATION (OM) OR INCUBATION 15 MIN @ 134 DEG C

Reviewed by

End of Report

Authorized Signatory by Ravi Kant Pathak



- ❖ The results listed refer only to tested sample & applicable parameters endorsement of product is neither inferred nor implied.
- ❖ Total liability of our lab is limited to the invoiced amount & sample will be destroyed after 90 days from the date of test report unless specified otherwise.
- ❖ The test report is not to be reproduced wholly or in part & cannot be used as evidence in the court of law & should not be used in any advertising media without our special permission in writing.
- ❖ The test report refers to the sample submitted to us & not drawn by Himway Test House Pvt. Ltd. unless mentioned otherwise.

Regd. Office : Plot No. 327, Street NO. 02, Santi Nagar (Nandgram) Ghaziabad-201003
 Mob. : 8448128057, 8448128058 | Email : himwaytesthouse@gmail.com, Visit us : www.himwaytesthouse.com



Himway Test House Pvt Ltd

ISO CERTIFIED/ISO ACCREDITED NABL LABORATORY

Nature of the Sample : **NM Graphene Membrane** Report No: 20092002
 Date Of Sampling : 19.09.2020
 Customer Ref. No: NMAF01-0409-106 Sample issue in Lab : 20.09.2020
 Test Started On : 20.09.2020
 Test Completed on : 23.09.2020

SAMPLING DETAILS

Sample Packing & Marking : Plastic Bag
 Sample Quantity : 1 Meter

TEST RESULTS:

Modified ISO 18184:2019 Tested method of Three sample against SARS-CoV-2 (COVID-19) at One contact Time of our sample.

Test Virus	Contact Time	Sample ID	Virus Titer (TCID ₅₀ per Carrier)	Mean Virust Titer (TCID ₅₀ per Carrier)	Mean Log ₁₀ Virus Titer (TCID ₅₀ per Carrier)	Log ₁₀ Reduction	Percent Reduction
SARS-CoV-2 (COVID-19)	Time Zero	Control sample	2.33E+06	3.70E+06	7.10	N.A.	N.A.
			7.38E+06				
			1.40E+06				
	30 Min	Control sample	7.29E+05	4.76E+05	6.15	5.12	99.99% Kill Rate: 13 second (99%)
			4.49E+05				
			2.51E+05				
	30 Min	Rigid Sample-1 (Test)	2.20E+03	3.68E+05	3.94	3.22	99.57% Kill Rate: 15 second (99%)
			2.22E+03				
			2.35E+03				
			1.90E+04				
			7.27E+05				
			7.20E+03				
		2.62E+03					

- * TCID₅₀ Tissue Culture Infectivity Dose at the 50% Endpoint
- * Log₁₀ and Percent Reductions for Control sample at 30Min calculated relative to Control sample immediately upon inoculation (Time Zero)
- * Log₁₀ and Percent Reduction for the three Test sample at 30 Min calculated relative to Control sample mean viral titer at 30 Min.
- * SAMPLE SIZE: DIAMETER = 4.80 +/- 0.1CM. PRE INCUBATION C : SARBOURAUD GLUCOSE AGAR. PRE INCUBATION D : SARBOURAUD GLUCOSE BROTH
- * DILUTE AGENT FOR INOCULATION: PHYSIOLOGIC SALT SOLUTION. INCUBATION: 30 DEG C. SPECIMEN PREPARATION : INCUBATION 15 MIN @ 134 DEG C

Reviewed by

End of Report

Authorized Signatory by Ravi Kant Pathak

- ❖ The results listed refer only to tested sample & applicable parameters endorsement of product is neither inferred nor implied.
- ❖ Total liability of our lab is limited to the invoiced amount & sample will be destroyed after 90 days from the date of test report unless specified otherwise.
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- ❖ The test report refers to the sample submitted to us & not drawn by Himway Test House Pvt. Ltd. unless mentioned otherwise.

Regd. Office : Plot No. 327, Street NO. 02, Santi Nagar (Nandgram) Ghaziabad-201003

Mob. : 8448128057, 8448128058 | Email : himwaytesthouse@gmail.com, Visit us : www.himwaytesthouse.com



Report No. (6720)308-0582
Page No. 04 of 04

TEST RESULTS

TESTED AGAINST: Influenza A Virus (H1N1): ATCC VR-1469

Sample: Fabric – Brown	Log Value
Reference Specimen Immediately after inoculation	5.2
Reference Specimen after 2 Hrs. contact time (of inoculation)	0.8
Antiviral Activity Log (Avg. Reduction)	4.4
Total Viral Activity Reduction (%)	99.997 %

-----END OF TEST REPORT-----



THE SOUTH INDIA TEXTILE RESEARCH ASSOCIATION

CENTRE OF EXCELLENCE FOR MEDICAL TEXTILES

Physical, Chemical & Biological Testing Laboratories

(ISO/IEC 17025 NABL ACCREDITED)

13/37, Avinashi Road, Aerodrome Post, Coimbatore - 641 014, INDIA

Test Report No : M2001990

Report Date : 19-09-2020

Ref : dt 05.09.2020

7 Log Reduction
99.99999%

Test Name : Antibacterial activity - Quantitative - ISO 20743

Test Condition:

Test Organisms Used : *Staphylococcus aureus* ATCC 6538, *Klebsiella pneumoniae* ATCC 4352
Sample size / Volume : 0.4 ± 0.05 g
Method of sterilization : Steam (Autoclave)
Media used : Nutrient agar
Dilution medium used : SCDLP medium
Method of plating : Spread plate method
Inoculum / plate : 0.1 mL
Incubation conditions : 37°C for 24 h

Observation :

	M2001990-1	
	Described by the customer : Solid: NMAF01-0409-102 Sample	
	<i>Staphylococcus aureus</i> ATCC 6538	<i>Klebsiella pneumoniae</i> ATCC 4352
Inoculated bacterial concentration (CFU / mL)	2.5 x 10 ⁵	2.4 x 10 ⁵
Difference of extremes for three control specimens initial (Criteria = Not more than 1.0)	0.09	0.08
Difference of extremes for three control specimens final (Criteria = Not more than 1.0)	0.01	0.125
Difference of extremes for three antibacterial test specimens initial (Criteria = Not more than 1.0)	0.017	0.019
Difference of extremes for three antibacterial test specimens final (Criteria = Not more than 1.0)	0	0
Growth value (F)	2.084	2.088
Growth value of (G)	-5.391	-5.373
Antibacterial activity value	7.475	7.461
Measuring method of bacterial concentration	Absorption Method	Absorption Method

Result : : The Test sample showed 7.475 antibacterial activity against *Staphylococcus aureus* ATCC 6538 and 7.461 antibacterial activity against *Klebsiella pneumoniae* ATCC 4352 when tested for ISO 20743 - Absorption Method

Verified by

- End of Report -

Authorized Signatory



CEG TEST HOUSE
AND RESEARCH CENTRE PVT. LTD.

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Tel. : 91-141-4046599, Fax : 91-141-2751806
info@cegtesthouse.com | www.cegtesthouse.com
CIN : U73100RJ2005PTC020304

Report No.: CEG/GA/20-21/03638

Date: 18/08/2020

RESULTS

Sr. No.	Size of Sample (cm ²)	Contact Duration (Mins)	<i>E.coli</i>				<i>S.aureus</i>			
			Number of bacteria inoculated at 0 min (cfu) (B)	Number of bacteria observed after contact duration (cfu) (A)	Bacterial Reduction		Number of bacteria inoculated at 0 min (cfu) (B)	Number of bacteria observed after contact duration (cfu) (A)	Bacterial Reduction	
					Log	%			Log	%
01.	01	5	230000	Nil	5	99.999	150000	12000	1	92.00
02.	01	10	230000	Nil	5	99.999	150000	Nil	5	99.999
03.	01	30	230000	Nil	5	99.999	150000	Nil	5	99.999

CFU=Colony Forming Unit | Percentage Reduction = (B - A/B)×100

Remark : The above tested product having antibacterial efficacy against gram-positive & gram-negative bacteria.

****End of the Report****

Page No. 3 of 3

Raj
18/08/2020
Checked by

Brij K. Vijaya
18/08/2020
Brij K. Vijaya
(Sr. Manager Q.A.)
Authorized Signatory

Note:

- Total liability of this laboratory is limited to the invoiced amount.
- The results listed refer only to the tested sample and applicable parameters. Endorsement of Product is neither inferred nor implied.
- This Test Report shall not be reproduced wholly or in part and can not be used as an evidence in the court of law without written approval of M/S CEG TH & RC
- From the date of issue of test report, the sample shall be stored, for 1 month in case of non perishable items, upto 1 year for pharma sample, unless otherwise specified in applicable standards/regulatory requirement.
- Sample(s) not drawn by M/S CEG TH & RC, unless specified in the report.



THE SOUTH INDIA TEXTILE RESEARCH ASSOCIATION

CENTRE OF EXCELLENCE FOR MEDICAL TEXTILES

Physical, Chemical & Biological Testing Laboratories

(ISO/IEC 17025 NABL ACCREDITED)

13/37, Avinashi Road, Aerodrome Post, Coimbatore - 641 014, INDIA

Test Report No : O2000605

Report Date : 10-08-2020

Ref : DT 01.08.2020

Bacterial filtration efficiency - ASTM F 2101	O2000605-1
	Sample Particulars : Sample ID- NMAF01-0409-056 -MP
Test Condition[s]	.
Test organisms used	<i>Staphylococcus aureus</i> ATCC 6538
Inoculum size	5 x 10 ⁵ CFU/mL
Media used	Tryptic soya agar
Dilution medium used	Peptone water
Incubation conditions	37 ⁰ C for 24 h
Results	.
Area of test specimen exposed	Fabric 10 x 10 cm
Sample exposure side	Face side
Flow rate of aerosol	28.5 L / min
Mean particle size of challenging aerosol	3.0 ± 0.3 micron
Average plate count of positive control	2091
Average plate count of negative control	0
BFE of test specimen (%)	99.4
The sample showed 99.4% bacterial filtration efficiency against <i>Staphylococcus aureus</i> ATCC 6538 when tested according to ASTM F 2101 test method.	

- End of Report -

(This is a computer generated report, hence does not require signature.)

Anti-viral testing Report

Sample	Membrane used for preparing mask
Chemical Nature of the material	Not informed
Sample Code No provided by Client	NMAF01-0409-078
Sample Code given by Seagull BioSolutions	SBPL-AV-001
Tests performed	1. Antiviral Test

Sample Preparation

Membrane was cut into one piece of 0.5 sq inch and another piece of 1 sq inch. Both these pieces were dipped in about 1 mL of animal cell culture medium (DMEM) and observed periodically for its ability to soak the medium. It was observed that the membrane soaked the culture medium after 1 mins and 20 sec exposure. At 2 mins, the 90% of the culture medium was recovered from the membrane. This was used for both the tests.

To ensure that all the antiviral component was extracted from the membrane, the membrane was soaked in 1 mL DMSO and incubated for 2 mins. The DMSO component was recovered and used for further testing.

Results: Total number of viable viruses present after exposure to membrane was determined.

No	Description of sample	No. of viruses (TCID ₅₀)/mL	% killing of the virus
1	MV virus treated with 0.5*0.5 inch membrane and used for infection on Vero cells	15800	99.4
2	MV virus treated with 1*1 inch membrane and used for infection on Vero cells	8890	99.7
3	MV Virus infected vero cells	2810000	-

Method

1. Actively growing Vero cells (NCCS, Pune) were split into 96 well plates at a density of 10,000 cells/well and allowed to settle overnight in complete medium (DMEM containing 10% Fetal calf serum).
2. Membrane was exposed to 1 mL of Measles Vaccine virus in DMEM for 2 mins and the aqueous extract collected. This was diluted 10 folds serially and used to infect animal cells (96 well plate) in quadruplicate (4 wells per dilution).



3. Virus Control: 1 mL of Measles Vaccine virus in DMEM was diluted 10 folds serially and used to infect 4 wells/dilution in 96 well plate.
4. The plates were incubated for 7 days and observed every 24 hrs for development of Measles virus cytopathic effect.
5. At the end of the 7 days, the number of viruses present in the Virus Control and the Measles virus exposed to the membrane was determined using TCID50 method.

Conclusion

- The membrane appears to reduce the number of viruses by more than 99% following 2 mins exposure.

Disclaimer:

1. Seagull is not accredited by any regulatory authority for testing materials for anti-viral activity.