US Patent Number

US 62/988,900

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CONFIRMATION NO. 9401

UPDATED FILING RECEIPT

166693
Law Offices of Sergei Orel, LLC
2125 Center Avenue, Suite 616
Fort Lee, NJ 07024

OC000000118340987

Date Mailed: 07/09/2020

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

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Inventor(s)

Jianliang GONG, Yau Ma Tei, HONG KONG;
Chun Yin OR, Cheung Sha Wan, HONG KONG;

Applicant(s)

Jianliang GONG, Yau Ma Tei, HONG KONG;
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Power of Attorney:
Michael Yablonsky--40407

Permission to Access Application via Priority Document Exchange: Yes

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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 62/988,900**
Projected Publication Date: None, application is not eligible for pre-grant publication
Non-Publication Request: No
Early Publication Request: No

** MICRO ENTITY **
Title

Air Filtration System and Manufacturing Method Therefor

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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HK Patent Number
32020008506.8

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Patents Registry, Intellectual Property Department
The Government of the Hong Kong Special Administrative Region

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Intellectual Property Department

In reply please quote this ref.: 32020008506.8
Your ref.: C200101/UM1HK
Tel.: 3543 1464
Fax.: 2838 6315

eMode

08 June, 2020

WORLD IP CONSULTANCY
Unit B, 3/F, Cheong Yu Bldg
No. 143-151 Castle Peak Rd, Yuen Long
HONG KONG

Application for Grant of a Short-term Patent
Under Application No. 32020008506.8

We refer to your application for a short-term patent lodged on 02 June, 2020.

The above application is found to have satisfied the minimum requirements as laid down in section 114(2) of the Patents Ordinance. The accorded date of filing is 02 June, 2020.

In general, you will receive our further letter for the application at least five months after the date of this letter. If you do not receive any letter from us after this period, please contact us at 2961 6901.

This is a letter issued by Nigel LEE for Registrar of Patents.

(This is a computer-generated copy. No signature is required.)

Intertek Tick Mark Endorsement

Proven KV99 mask has been independently tested by Intertek, with the highest score ever on disposable mask. Intertek endorsed safety, quality, and performance of KV99.

Viral Filtration Efficiency (VFE) in ASTM F2101

Proven that OOH SHIELD technology can effectively **filter virus (>99.9a%)**

Nelson Labs.
A Sotera Health company

Sponsor:
Eddie Yam
Intertek Testing Services Hong Kong Ltd.
1/F, Garment Centre, 576 Castle Peak Road
Kowloon,
HONG KONG

Viral Filtration Efficiency (VFE) Final Report

Test Article:	modified non-woven colour: White Style #1001
Study Number:	1280865-S01
Study Received Date:	25 Mar 2020
Testing Facility:	Nelson Laboratories, LLC 6280 S. Redwood Rd. Salt Lake City, UT 84123 U.S.A.
Test Procedure(s):	Standard Test Protocol (STP) Number: STP0007 Rev 16
Deviation(s):	None

Summary: The VFE test is performed to determine the filtration efficiency of test articles by comparing the viral control counts upstream of the test article to the counts downstream. A suspension of bacteriophage ΦX174 was aerosolized using a nebulizer and delivered to the test article at a constant flow rate and fixed air pressure. The challenge delivery was maintained at 1.1 - 3.3 x 10^3 plaque forming units (PFU) with a mean particle size (MPS) of 3.0 µm ± 0.3 µm. The aerosol droplets were drawn through a six-stage, viable particle, Andersen sampler for collection. The VFE test procedure was adapted from ASTM F2101.

All test method acceptance criteria were met. Testing was performed in compliance with US FDA good manufacturing practice (GMP) regulations 21 CFR Parts 210, 211 and 820.

Test Side:	Either
Test Area:	~40 cm^2
VFE Flow Rate:	28.3 Liters per minute (L/min)
Conditioning Parameters:	85 ± 5% relative humidity (RH) and 21 ± 5°C for a minimum of 4 hours
Positive Control Average:	1.6 x 10^3 PFU
Negative Monitor Count:	<1 PFU
MPS:	2.9 µm

Study Director — James W. Luskin — Study Completion Date: 09 Apr 2020

1280865-S01

Results:

Test Article Number	Percent VFE (%)
1	>99.9[a]
2	>99.9[a]
3	>99.9[a]
4	>99.9[a]
5	>99.9[a]

[a] There were no detected plaques on any of the Andersen sampler plates for this test article.

The filtration efficiency percentages were calculated using the following equation:

$$\%\,VFE = \frac{C - T}{C}\ x\ 100$$

C = Positive control average

T = Plate count total recovered downstream of the test article
Note: The plate count total is available upon request

Bacterial Filtration Efficiency with Increased Delivery Challenge (BFE) in ASTM F2101 and EN14683

Proven that OOH SHIELD technology can effectively filter increased challenge of bacteria (99.8%)

Nelson Labs.
A Sotera Health company

Sponsor:
Wong Chak Ming
Hong Kong Medical Supply Limited
Unit A3, 2F Mai Wah Industrial Bldg.
1-7 Wah Sing Street
Hong Kong,
CHINA

Bacterial Filtration Efficiency (BFE) Final Report

Test Article:	HKMSLMASK000
Purchase Order:	HKMSLPO20200326
Study Number:	1282265-S01
Study Received Date:	28 Mar 2020
Testing Facility:	Nelson Laboratories, LLC 6280 S. Redwood Rd. Salt Lake City, UT 84123 U.S.A.
Test Procedure(s):	Standard Test Protocol (STP) Number: STP0004 Rev 18
Deviation(s):	None

Summary: The BFE test is performed to determine the filtration efficiency of test articles by comparing the bacterial control counts upstream of the test article to the bacterial counts downstream. A suspension of *Staphylococcus aureus* was aerosolized using a nebulizer and delivered to the test article at a constant flow rate and fixed air pressure. The challenge delivery was maintained at 3.5×10^3 colony forming units (CFU) with a mean particle size (MPS) of 3.0 ± 0.3 µm. The aerosols were drawn through a six-stage, viable particle, Andersen sampler for collection. This test method complies with ASTM F2101-19 and EN 14683:2019, Annex B; with the exception of the higher challenge level, which may represent a more severe test.

All test method acceptance criteria were met. Testing was performed in compliance with US FDA good manufacturing practice (GMP) regulations 21 CFR Parts 210, 211 and 820.

Test Side:	Inside
BFE Test Area:	~40 cm^2
BFE Flow Rate:	28.3 Liters per minute (L/min)
Conditioning Parameters:	85 ± 5% relative humidity (RH) and 21 ± 5°C for a minimum of 4 hours
Test Article Dimensions:	~176 mm x ~160 mm
Positive Control Average:	3.5×10^3 CFU
Negative Monitor Count:	<1 CFU
MPS:	3.0 µm

The positive control average was out of specification per STP0004 Rev 18 section 6.1 which states, "The BFE positive control average shall be maintained at $1.7\text{-}3.0 \times 10^3$ CFU." Testing with a more severe challenge to the test articles represents a worse case. The sponsor accepted the use of the higher challenge; therefore, the results are considered valid at the testing conditions that occurred.

ilac-MRA ANAB ACCREDITED TESTING LABORATORY

Alyssa Sanders — Study Director
for James W. Luskin
20 Apr 2020 — Study Completion Date

1282265-S01

Results:

Test Article Number	Percent BFE (%)
1	99.8
2	99.8
3	99.8
4	99.8
5	99.8

The filtration efficiency percentages were calculated using the following equation:

$$\% BFE = \frac{C - T}{C} x\ 100$$

C = Positive control average
T = Plate count total recovered downstream of the test article
Note: The plate count total is available upon request

Viral Filtration Efficiency (VFE) in ASTM F2101

Proven that OOH SHIELD technology can effectively filter virus (>99.9a%)

intertek
Total Quality. Assured.

Number: HKGT05112613-S1

TEST REPORT

Applicant: CURIE LIMITED
B3-1 G/F
SUPERLUCK INDL CTR PHASE 2
57 SHA TSUI RD
TSUEN WAN NT HK

Attn: ALDRIN OR

Date: Apr 22, 2020
This is to supersede report no. HKGT05112613 dated Apr 21, 2020

Sample Description As Declared :

No. Of Sample	:	Several
Buyer's Name	:	-
Agent's Name	:	-
Manufacturer's Name	:	Curie Limited
Sample Description	:	Curie Ultrahigh-Efficiency Viral Filter超高效病毒濾材
Colour	:	White
Style No.	:	1001
Order No. / PO No.	:	-
Product End Uses	:	-
Fibre Content	:	Nonwoven
Fabric/GMT Weight	:	20g
Ref.	:	-

Date Received/Date Test Started : Apr 15, 2020

Applicant's Provided Care Instruction/Label :

-

intertek
Total Quality. Assured.

Number: HKGT05112613-S1

TEST REPORT

Original Sample Photo:

For any queries on this report, you are welcome to contact our customer service representatives:

US3
Angie Yu (852) 98639123 or email to angie.yu@intertek.com

intertek
Total Quality. Assured.

Number: HKGT05112613-S1

TEST REPORT

Tests Conducted (As Requested By The Applicant)

1 Evaluation of Viral Filtration Efficiency (VFE):

Summary: The VFE test is performed to determine the filtration efficiency of test articles by comparing the viral control counts upstream of the test article to the counts downstream. A suspension of bacteriophage ΦX174 was aerosolized using a nebulizer and delivered to the test article at a constant flow rate and fixed air pressure. The challenge delivery was maintained at $1.1 - 3.3 \times 10^3$ plaque forming units (PFU) with a mean particle size (MPS) of 3.0 ± 0.3 μm. The aerosols droplets were drawn through a six-stage, viable particle, Andersen sampler for collection. The VFE test procedure was adapted from ASTM F2101.

All test method acceptance criteria were met. Testing was performed in compliance with US FDA good manufacturing practice (GMP) regulations 21 CFR Parts 210, 211 and 820.

Test side: Either

Test Area: ~40 cm²

VFE Flow Rate: 28.3 Liters per minute (L/min)

Conditioning Parameters: 85 ± 5% relative humidity (RH) and 21 ± 5 °C for a minimum of 4 hours

Positive Control Average: 1.6×10^3 PFU

Negative Monitor Count: <1 PFU

MPS: 2.9 μm

intertek
Total Quality. Assured.

Number: HKGT05112613-S1

TEST REPORT

Tests Conducted (As Requested By The Applicant)

Evaluation of Viral Filtration Efficiency (Cont'd)

Result:

Test Article Number	Percent VFE (%)
1	>99.9[a]
2	>99.9[a]
3	>99.9[a]
4	>99.9[a]
5	>99.9[a]

[a] There were no detected plaques on any of the Andersen sampler plates for this test article.

The filtration efficiency percentages were calculated using the following equation:

$$\%VFE = \frac{C - T}{C} x100$$

C= Positive control average
T= Plate count total recovered downstream of the test article
Note: The plate count total is available upon request

Remark: The test was conducted by competent subcontractor lab.

End of Report

Bacterial Filtration Efficiency (BFE) in ASTM F2101 and EN14683

Proven that OOH SHIELD technology can effectively filter bacteria (99.9%), complying ASTM F2101 Level 3 and EN14683 Type IIR

Air Exchange Pressure in ASTM F2101 / EN14683

Proven that air exchange pressure of KV99.81 masks can comply with standards of ASTM F2101 Level 3 and EN14683 Type IIR

Nelson Labs.
A Sotera Health company

Sponsor:
Wing Wah Medicine Group Holdings Limited
1/F Ching Cheong Industrial Building
1-7 Kwai Chong Rd
Kwai Chung, NT

Bacterial Filtration Efficiency (BFE) and Differential Pressure (Delta P) Final Report

Test Article:	4 Ply Disposable Medical Mask Colour: White Fiber Content: Curie Biohazard Filter + SS Non-Woven
Purchase Order:	R904838210
Study Number:	1334934-S01
Study Received Date:	25 Aug 2020
Testing Facility:	Nelson Laboratories, LLC 6280 S. Redwood Rd. Salt Lake City, UT 84123 U.S.A.
Test Procedure(s):	Standard Test Protocol (STP) Number: STP0004 Rev 18
Deviation(s):	None

Summary: The BFE test is performed to determine the filtration efficiency of test articles by comparing the bacterial control counts upstream of the test article to the bacterial counts downstream. A suspension of *Staphylococcus aureus* was aerosolized using a nebulizer and delivered to the test article at a constant flow rate and fixed air pressure. The challenge delivery was maintained at 1.7 - 3.0 x 10^3 colony forming units (CFU) with a mean particle size (MPS) of 3.0 ± 0.3 µm. The aerosols were drawn through a six-stage, viable particle, Andersen sampler for collection. This test method complies with ASTM F2101-19 and EN 14683:2019, Annex B.

The Delta P test is performed to determine the breathability of test articles by measuring the differential air pressure on either side of the test article using a manometer, at a constant flow rate. The Delta P test complies with EN 14683:2019, Annex C and ASTM F2100-19.

All test method acceptance criteria were met. Testing was performed in compliance with US FDA good manufacturing practice (GMP) regulations 21 CFR Parts 210, 211 and 820.

Test Side:	Inside
BFE Test Area:	~40 cm^2
BFE Flow Rate:	28.3 Liters per minute (L/min)
Delta P Flow Rate:	8 L/min
Conditioning Parameters:	85 ± 5% relative humidity (RH) and 21 ± 5°C for a minimum of 4 hours
Test Article Dimensions:	~175 mm x ~165 mm
Positive Control Average:	2.0 x 10^3 CFU
Negative Monitor Count:	<1 CFU
MPS:	3.0 µm

ilac-MRA ANAB ACCREDITED TESTING LABORATORY

Leah Tiberius electronically approved for James Luskin
Study Director

18 Sep 2020 16:53 (+00:00)
Study Completion Date and Time

Results:

Test Article Number	Percent BFE (%)
1	>99.9
2	99.9
3	>99.9[a]
4	>99.9
5	99.8

[a] There were no detected colonies on any of the Andersen sampler plates for this test article.

Test Article Number	Delta P (mm H_2O/cm^2)	Delta P (Pa/cm^2)
1	5.2	50.6
2	5.2	50.5
3	5.4	52.6
4	5.3	51.5
5	4.8	47.5

The filtration efficiency percentages were calculated using the following equation:

$$\% BFE = \frac{C - T}{C} x\ 100$$

C = Positive control average
T = Plate count total recovered downstream of the test article
Note: The plate count total is available upon request

Microbial Cleanliness (Bioburden) of Medical Masks in EN14683

Proven that total bioburden of KV99.81 can comply with standard of EN14683 Type IIR (<6 cfu)

Nelson Labs
A Sotera Health company

Sponsor:
Wing Wah Medicine Group Holdings Limited
1/F Ching Cheong Industrial Building
1-7 Kwai Chong Rd
Kwai Chung, NT
HONG KONG

Microbial Cleanliness (Bioburden) of Medical Masks Final Report

Test Article:	4 Ply Disposable Medical Mask Colour: White Fiber Content: Curie Biohazard Filter + SS Non-Woven
Purchase Order:	R904838210
Study Number:	1334930-S01
Study Received Date:	25 Aug 2020
Testing Facility:	Nelson Laboratories, LLC 6280 S. Redwood Rd. Salt Lake City, UT 84123 U.S.A.
Test Procedure(s):	Standard Test Protocol (STP) Number: STP0036 Rev 15 Customer Specification Sheet (CSS) Number: 202002096 Rev 01
Deviation(s):	None

Summary: The testing was conducted in accordance with EN 14683:2019, with the exception of approximate volumes of eluent used when performing the extraction procedure and a temperature range of 30-35°C used for aerobic incubation.

When bioburden results are calculated using a software program, manual calculations may differ slightly due to rounding. The counts determined on products are colony forming units and may not always reflect individual microorganisms. The sponsor performs any statistical analysis and determines the acceptable limits. Testing was performed in compliance with US FDA good manufacturing practice (GMP) regulations 21 CFR Parts 210, 211 and 820.

ilac-MRA ANAB ACCREDITED TESTING LABORATORY

Robert Putnam electronically approved
Study Director Robert Putnam

24 Sep 2020 02:10 (+00:00)
Study Completion Date and Time

Results:

Unit Number	Weight (g)	Aerobic	Fungal	Total Bioburden (CFU/mask)	Total Bioburden (CFU/g)
1	4.3	<3	<3	<5.7	<1.3
2	4.3	6	<3	<8.9	<2.1
3	4.2	<3	<3	<5.8	<1.4
4	4.2	3	<3	<6.0	<1.4
5	4.2	<3	<3	<6.0	<1.4
Recovery Efficiency	UTD[a]				

< = No Organisms Detected
UTD = Unable to Determine
Note: The results are reported as colony forming units per test article.
[a] UTD due to zero count on the first rinse. An alternative method or inoculated product recovery efficiency is recommended.

Method Suitability:

Organism	Percentage
Bacillus atrophaeus	0%

Test Method Acceptance Criteria: If applicable, anaerobic controls are acceptable for the bioburden test results. The number of masks to be tested shall be a minimum of 5 or more to meet an acceptable quality level of 4%. The bioburden of the medical mask shall be < 30 CFU/g tested.

Procedure:

Positive Controls/Monitors:	*Bacillus atrophaeus*
Extract Fluid:	Peptone Tween®
Extract Fluid Volume:	~300 mL
Extract Method:	Orbital Shaking for 15 minutes at 250 rpm
Plating Method:	Membrane Filtration
Agar Medium:	Tryptic Soy Agar Potato Dextrose Agar
Recovery Efficiency:	Exhaustive Rinse Method
Aerobic Bacteria:	Plates were incubated 3-7 days at 30-35°C, then enumerated.
Fungal:	Plates were incubated 5-7 days at 20-25°C, then enumerated.

Synthetic Blood Penetration Pressure in ASTM F2101 / ASTM F1862 / EN14683

Proven that KV99.81 mask can effectively intercept fluid (160mmHg) from penetration, complying ASTM F2101 Level 3 and EN14683 Type IIR

Nelson Labs
A Sotera Health company

Sponsor:
Wing Wah Medicine Group Holdings Limited
1/F Ching Cheong Industrial Building
1-7 Kwai Cheong Road
Kwai Chung, NT

Synthetic Blood Penetration Resistance Final Report

Test Article:	4 Ply Disposable Medical Mask Colour: White Fiber Content: Curie Biohazard Filter + SS Non-Woven
Purchase Order:	R904838210
Study Number:	1334931-S01
Study Received Date:	25 Aug 2020
Testing Facility:	Nelson Laboratories, LLC 6280 S. Redwood Rd. Salt Lake City, UT 84123 U.S.A.
Test Procedure(s):	Standard Test Protocol (STP) Number: STP0012 Rev 09
Deviation(s):	None

Summary: This procedure was performed to evaluate surgical facemasks and other types of protective clothing materials designed to protect against fluid penetration. The purpose of this procedure is to simulate an arterial spray and evaluate the effectiveness of the test article in protecting the user from possible exposure to blood and other body fluids. The distance from the target area surface to the tip of the cannula is 30.5 cm. A test volume of 2 mL of synthetic blood was employed using the targeting plate method.

This test method was designed to comply with ASTM F1862 and ISO 22609 (as referenced in EN 14683:2019 and AS4381:2015) with the following exception: ISO 22609 requires testing to be performed in an environment with a temperature of 21 ± 5°C and a relative humidity of 85 ± 10%. Instead, testing was performed at ambient conditions within one minute of removal from the environmental chamber held at those parameters.

All test method acceptance criteria were met. Testing was performed in compliance with US FDA good manufacturing practice (GMP) regulations 21 CFR Parts 210, 211 and 820.

Number of Test Articles Tested:	32
Number of Test Articles Passed:	32
Test Side:	Outside
Pre-Conditioning:	Minimum of 4 hours at 21 ± 5°C and 85 ± 5% relative humidity (RH)
Test Conditions:	23.2°C and 22% RH

Results: Per ASTM F1862 and ISO 22609, an acceptable quality limit of 4.0% is met for a normal single sampling plan when ≥29 of 32 test articles show passing results.

Test Pressure: 160 mmHg (21.3 kPa)

Test Article Number	Synthetic Blood Penetration
1-32	None Seen

Study Director FOR James W. Luskin

17 SEP 2020
Study Completion Date

1334931-S01

801-290-7500 | nelsonlabs.com | sales@nelsonlabs.com

Sub-Micron Particulate Filtration Efficiency (0.1μm PSL) in ASTM F2101 / ASTM F2299 / EN14683

Proven that KV99.81 masks can effectively filter 0.1μm sub-micron particulate (>99.8%), complying ASTM F2101 Level 3 and EN14683 Type IIR

Nelson Labs
A Sotera Health company

Sponsor:
Wing Wah Medicine Group Holdings Limited
1/F Ching Cheong Industrial Building,
1-7 Kwai Chong Rd,
Kwai Chung, NT

Latex Particle Challenge Final Report

Test Article:	4 Ply Disposable Medical Mask Colour: White Fiber Content: Curie Biohazard Filter + SS Non-Woven
Purchase Order:	R904838210
Study Number:	1334932-S01
Study Received Date:	25 Aug 2020
Testing Facility:	Nelson Laboratories, LLC 6280 S. Redwood Rd. Salt Lake City, UT 84123 U.S.A.
Test Procedure(s):	Standard Test Protocol (STP) Number: STP0005 Rev 08
Deviation(s):	None

Summary: This procedure was performed to evaluate the non-viable particle filtration efficiency (PFE) of the test article. Monodispersed polystyrene latex spheres (PSL) were nebulized (atomized), dried, and passed through the test article. The particles that passed through the test article were enumerated using a laser particle counter.

A one-minute count was performed, with the test article in the system. A one-minute control count was performed, without a test article in the system, before and after each test article. Control counts were performed to determine the average number of particles delivered to the test article. The filtration efficiency was calculated using the number of particles penetrating the test article compared to the average of the control values. During testing and controls, the air flow rate is maintained at 1 cubic foot per minute (CFM) ± 5%.

The procedure employed the basic particle filtration method described in ASTM F2299, with some exceptions; notably the procedure incorporated a non-neutralized challenge. In real use, particles carry a charge, thus this challenge represents a more natural state. The non-neutralized aerosol is also specified in the FDA guidance document on surgical face masks. All test method acceptance criteria were met. Testing was performed in compliance with US FDA good manufacturing practice (GMP) regulations 21 CFR Parts 210, 211 and 820.

Test Side:	Inside
Area Tested:	91.5 cm^2
Particle Size:	0.1 μm
Laboratory Conditions:	21°C, 28% relative humidity (RH) at 1813; 21°C, 28% RH at 1911
Average Filtration Efficiency:	99.86%
Standard Deviation:	0.038

ilac-MRA ANAB ACCREDITED TESTING LABORATORY

Trang Truong electronically approved for — 16 Sep 2020 22:26 (+00:00)
Study Director: Curtis Gerow — Study Completion Date and Time

Results:

Test Article Number	Test Article Counts	Average Control Counts	Filtration Efficiency (%)
1	9	10,448	99.914
2	17	11,356	99.85
3	22	12,202	99.82
4	19	12,264	99.85
5	13	12,067	99.89

Standard for the Flammability of Clothing Textiles - US 16 CFR Part 1610

Proven that KV99.81 masks can comply with Class 1 - Normal Flammability

intertek
Total Quality. Assured.

Issuing Laboratory:
Intertek Testing Services Hong Kong Ltd.
Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 005) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

Number: HKGT05148314

TEST REPORT

Applicant: WING WAH MEDICINE GROUP HOLDINGS LIMITED
1/F CHING CHEONG IND BLDG
1-7 KWAI CHEONG RD
KWAI CHUNG NT
HK

Attn: ANNIE AU

Date: Sep 28, 2020

Sample Description As Declared :

No. Of Sample	: Several
Buyer's Name	: -
Agent's Name	: -
Manufacturer's Name	: -
Sample Description	: 4 Ply Disposable Medical Mask
Colour	: White
Style No.	: -
Order No. / PO No.	: -
Product End Uses	: -
Fibre Content	: Curie Biohazard Filter + SS Non-Woven
Fabric/GMT Weight	: -
Ref.	: -

Date Received/Date Test Started : Aug 18, 2020

Applicant's Provided Care Instruction/Label :
-

For and on behalf of
Intertek Testing Services HK Ltd

WONG Sai Ming
Technical Supervisor II

Intertek Testing Services Hong Kong Limited
2/F, Garment Centre,
576 Castle Peak Road,
Kowloon, Hong Kong SAR, China
Tel +852 2173 8888
Fax +852 2786 1903
intertek.com.hk

Issuing Laboratory:
Intertek Testing Services Hong Kong Ltd.
Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 005) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

Number: HKGT05148314

TEST REPORT

Tests Conducted (As Requested By The Applicant)

1 Flammability of 45 degree angle test (US 16 CFR Part 1610 - Standard for the Flammability of Clothing Textiles):

[X] Plain Surface [ ] Raised Surface

Prelim Plain Surface:
Length : IBE
Width : IBE

Burn Direction:	☒ Length ☐ Width
	Original (seconds)
1.	IBE
2.	IBE
3.	DNI
4.	IBE
5.	DNI
6.	-
7.	-
8.	-
9.	-
10.	-

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Number: HKGT05148314

TEST REPORT

Tests Conducted (As Requested By The Applicant)

Flammability of 45 degree angle test (Cont'd)

Classification:	☒	Class 1,	Normal Flammability
	☐	Class 2,	Intermediate Flammability, Raised Surface
	☐	Class 3,	Rapid And Intense Burning,

Explanation Of Flammability Results:

DNI	Did not ignite.
IBE	Ignited but extinguished.
_.._ sec.	Actual burn time measured and recorded by the timing device.
SF uc	Surface flash, under the stop thread, but does not break the stop thread.
SF pw	Surface flash, part way. No time shown because the surface flash did not reach the stop thread.
SF poi	Surface flash, at point of impingement only(equivalent to "Did not ignite" for plain surfaces).
_.._ SF only	Time in seconds, surface flash only. No damage to the base fabric.
_.._ SFBB	Time in seconds, surface flash base burn starting at places other than the point of impingement as a result of surface flash
_.._ SFBB poi	Time in seconds, surface flash base burn starting at the point of impingement.
_.._ SFBB poi*	Time in seconds, surface flash base burn possibly starting at the point of impingement. The asterisk is accompanied by the following statement : "Unable to make absolute determination as to source of base burns." This statement is added to the result of any specimen if there is a question as to origin of the base burn.

End of Report

Intertek Testing Services Hong Kong Limited
2/F, Garment Centre,
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Kowloon, Hong Kong SAR, China
Tel +852 2173 8888
Fax +852 2786 1903
intertek.com.hk

Determination of Antiviral Activity of Textile Products BS ISO 18184

Proven that OOH SHIELD technology can effectively kill COVID-19 Coronavirus SARS-CoV-2 (>99.81%)

ATCCR

Report No: ATCCR20081010F

Test Report

Sample Category	Curie Ultrahigh-Efficiency Viral Filter for KV-99
Client	Curie Limited
Test Category	Test Entrust
Date of Report	2020.08.18

北京京畿分析测试中心有限公司

Analytical and Testing Center of Capital Regions

Report No: ATCCR20081010F

Detection Information

Client	Curie Limited		Sample Source	Inspect
Client address	Room C,23/F,Tsuen Tung Factory Building,38-40 Chai Wan KOK Street, Tsuen Wan,Hong Kong		Sample State	Normal
Date of Receives samples	2020.08.10		Date(s) of tests	2020.08.10-2020.08.18
Sample No	ATCCR20081010F-0810CP01			
Category	Test Project	Test Standard and Method		Test Instruments
Curie Ultrahigh-Efficiency Viral Filter for KV-99	Antiviral Activity Value (COVID-19)	ISO 18184:2019 Textiles Determination of antiviral		Biosafety Cabinet

End

Remarks	Production units: Curie Limited Trademarks: Curie Date of production: 2020.06.09 Sample model: Curie Ultrahigh-Efficiency Viral Filter for KV-99 Sample batch: 1001

Report Preparer: 刘畅

Report Reviewer:

Authorized Signatory:

t Date of Issues Repor: 2020.08.18

(Special Chapter for Inspection and Inspection)

Test results

Virus Types	(NO)	lg(Va_{0h})（lgTCID$_{50}$/mL）	lg(Vb_{2h})（lgTCID$_{50}$/mL）	lg(Vc_{2h})（lgTCID$_{50}$/mL）
COVID-19 virus MDCK cells	1	6.73	6.68	3.7
	2	6.68	6.56	4
	3	6.7	6.57	3.9
Average Value of lgTCID$_{50}$/mL		6.70	6.61	3.88
Antiviral Activity Value		2.72		
Antiviral Activity Rate (%)		99.81		

End

Beijing Shantong Medical Testing Laboratory

Declaration of Test Results

Beijing Shantong Medical Testing Lab "BSMTL" hereby declares that the test item described below has been tested by BSMTL and complies with the requirements of

ISO 18184: 2019 Textile Determination of Antiviral

The complete detail of the tests performed and the results are recorded in
Report No: ATCCR20081010F Dated: 18.08.2020

Description of item tested: *Curie Ultrahigh-Efficiency Viral Filter for KV-99*

Virus Tested: SARS-COV-2 / COVID-19 MDCK Cells

Summary of test results -

Antiviral Activity Value: ***2.72***

Antiviral Activity Rate: ***99.81%***

Submitted by: *Curie Limited*
Room C, 23/F,Tsuen Tung Factory Building,38-40 Chai Wan Kok Street, Tsuen Wan, Hong Kong SAR

Declaration authorised by:

Name: 赵志刚

Title: 实验室负责人

Date: 02/09/2020

北京善德医学检验实验室有限公司 1101081423656

Attention is drawn to the conditions upon which this declaration is issued, namely:

1. *This declaration does not indicate provide or imply any measure of Approval, Certification, Supervision, Control or Surveillance by BSMTL to this or any related product.*
2. *This Declaration applied only to the particular sample tested and to the specific tests carried out as detailed in the Report referred to above.*
3. *The general and specific conditions of the BSMTL Conditions of Contract for Testing, apply in all respects.*

统一社会信用代码

91110111MA01A4KK4D

营业执照

(副 本) (1-1)

扫描二维码登录"国家企业信用信息公示系统"了解更多登记、备案、许可、监管信息

名　　称　北京普通医学检验实验室有限公司

类　　型　有限责任公司(法人独资)

法定代表人　杨益

经营范围　医学检验医疗服务；技术开发、技术转让、技术咨询、技术服务。（企业依法自主选择经营项目，开展经营活动；医疗服务以及依法须经批准的项目，经相关部门批准后依批准的内容开展经营活动；不得从事本市产业政策禁止和限制类项目的经营活动。）

注册资本　600万元

成立日期　2018年01月24日

营业期限　2018年01月24日 至 2048年01月23日

住　　所　北京市房山区拱辰街道办事处学园北街11号综合服务楼一层5106

登记机关　北京市工商行政管理局房山分局

2019年 05月 28日

国家企业信用信息公示系统网址：http://www.gsxt.gov.cn

市场主体应当于每年1月1日至6月30日通过国家企业信用信息公示系统报送公示年度报告。

国家市场监督管理总局监制

中华人民共和国

医疗机构执业许可证

机构名称 北京善通医学检验实验室

法定代表人 杨益

地　　址 北京市房山区拱辰街道办事处学园北街1号综合服务楼一层

主要负责人 赵志国

诊疗科目 医学检验科；临床免疫、血清学专业；临床细胞分子遗传学专业******

登记号 007913110111417919

有效期限 自 2019年 07月 02日至 2022 年 12月 30 日

该医疗机构经核准登记，准予执业

中华人民共和国国家卫生和计划生育委员会

发证机关 北京市房山区卫生健康委员会

发证日期 2019 年 8月 14日

开户许可证

核准号：J1000210464502

编 号：1000-03577720

经审核，北京善通医学检验实验室有限公司 符合开户条件，准予开立基本存款账户。

法定代表人（单位负责人）杨益

开户银行 兴业银行股份有限公司北京房山支行

账　号 321580100100032556

发证机关（盖章）

2018年11月16日

北京市卫生健康委员会

北京市卫生健康委员会关于同意密云区医院等11家检测机构开展新型冠状病毒核酸检测的通知

西城区、朝阳区、丰台区、房山区、顺义区、大兴区、密云区卫生健康委，经济开发区，市疾控中心，市医学检验质控中心，各相关医疗机构：

根据北京市密云区医院、北京市西城区展览路医院、北京市丰台区铁营医院、北京市朝阳区三环肿瘤医院、北京朝阳急诊抢救中心、北京朝阳中西医结合急诊抢救中心、北京市大兴区中西医结合医院、北京北亚骨科医院、北京德威铭达医学检验所、北京善通医学检验实验室和北京索真医学检验实验室等11家检测机构（以下简称11家检测机构）提交的开展新冠病毒核酸检测的申请，结合专家评估意见，经研究，现就有关事项通知如下：

一、同意11家检测机构开展新型冠状病毒核酸检测工作。

二、11家检测机构要严格按照国家和本市关于开展新型冠状病毒核酸检测、生物安全防护、生物样本资源管理的有

北京市病原微生物实验室及实验室活动备案通知书

京房山卫实验室备字[2020]第043号

北京善通医学检验实验室有限公司 ：

你单位于2020年06月27日提交的北京市病原微生物实验室及实验活动备案材料如下：

1. ☑《北京市病原微生物实验室及实验室活动备案表》；

2. ☑ 实验室或实验室设立单位的法人资格证明；

3. ☑ 实验室设立单位生物安全组织管理框架图；

4. ☑ 实验室布局平面图；

经本机关审查，认为申请材料齐全、符合《北京市病原微生物实验室及实验活动备案管理办法》的要求，决定予以备案。

卫生健康行政部门（印章）

2020年06月27日

备注：此备案旨在了解你单位实验室及其实验活动基本状况，不作为审批依据。请你单位备案后，严格按照《中华人民共和国传染病法》、《病原微生物实验室生物安全管理条例》和《人间传染的高致病性病原微生物实验室和实验活动生物安全审批管理办法》等相关法律法规规定，从事相关实验活动，规范实验室管理。

北京市卫生健康委员会制定

Sub-Micron Particulate Filtration Efficiency (0.1μm PSL) in ASTM F2101 / ASTM F2299 / EN14683

Proven that KV99.81 masks can effectively filter 0.1μm sub-micron particulate (>99%), complying ASTM F2101 Level 3 and EN14683 Type IIR

Air Exchange Pressure in ASTM F2101 / EN14683

Proven that air exchange pressure of KV99.81 masks can comply with standards of ASTM F2101 Level 3 and EN14683 Type IIR

TTRI 財團法人紡織產業綜合研究所 Taiwan Textile Research Institute

TEST REPORT TUCHENG

Date: Aug.31,2020 Date of Receipt: Aug.24,2020

Report No.: TFF9H598 Quantity: 1PC Page Order/Pages: (P1/5) Ref. No.: NIL

Report Title: Curie Limited(U3104) Item: Mask

Address: No. 108, Ganhe Rd., Xitun Dist., Taichung City 407, Taiwan

Test Items		Test Results	Test Methods
Sub-Micron Particulate Filtration Efficiency(%) (0.1μm PSL)	1	99.49	ASTM F2100-2019 9.3 ASTM F2299-2017 Flow rate:28.1 (Liter/min)
	2	99.45	
	3	99.46	
	4	99.48	
	5	99.48	
	Ave.	99.47	
Air Exchange Pressure (mmH2O/cm²)	1	5.3	ASTM F2100-2019 9.2 EN 14683:2019 Annex C
	2	5.3	
	3	4.9	
	4	5.1	
	5	5.3	
Flammability (as Received)		DNI	ASTM F2100-2019 9.5 CPSC 16 CFR 1610-2008

Note: 1mmH2O=9.8Pa.

Note: Air Exchange Pressure takes 5 pieces for testing.

Note: Flammability takes 20 samples for testing.

Note: "DNI":Did Not Ignite.

Note: Sample description is given by the client: Brandname: Curie
Model: Curie KV99 Face Mask
Hong Kong address: Unit C, 23F, Tsun Tung Factory Bldg 38-40
Chai Wan Kok St, Tsuen Wan. NT Hong Kong

Note: The test report is the test results issued by the testing institution as requested by the consignor, it shall not determine the legitimacy of the product.

Authorized by president of Taiwan Textile Research Institute

Jui-hung Kao

Director, Department of Testing and Certification

Department of Testing and Certification, Taiwan Textile Research Institute
No.6, Chengtian Rd., Tucheng Dist., New Taipei City 23674, Taiwan (R.O.C.)
Tel : +886-2-22670321 ext. 7107, 7110
Fax : +886-2-22675108 , +886-2-22689839

TTRI 財團法人紡織產業綜合研究所 Taiwan Textile Research Institute

TEST REPORT TUCHENG

Date: Aug.31,2020 Date of Receipt: Aug.24,2020

Report No.: TFF9H599 Quantity: 1PC Page Order/Pages: (P1/5) Ref. No.: NIL

Report Title: Curie Limited(U3104) Item: Mask

Address: No. 108, Ganhe Rd., Xitun Dist., Taichung City 407, Taiwan

Test Items		Test Results	Test Methods
Air Exchange Pressure (Pa/cm²)	1	50.7	EN 14683:2019 Annex C
	2	49.1	
	3	49.7	
	4	51.3	
	5	48.8	

Note: Sample description is given by the client: Brandname: Curie
Model: Curie KV99 Face Mask
Hong Kong address: Unit C, 23F, Tsun Tung Factory Bldg 38-40
Chai Wan Kok St, Tsuen Wan. NT Hong Kong

Note: The test report is the test results issued by the testing institution as requested by the consignor, it shall not determine the legitimacy of the product.

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Synthetic Blood Penetration Pressure in ASTM F2101 / ASTM F1862 / EN14683

Proven that KV99.81 mask can effectively intercept fluid (160mmHg) from penetration, complying ASTM F2101 Level 3 and EN14683 Type IIR

TTRI 財團法人紡織產業綜合研究所 Taiwan Textile Research Institute

TEST REPORT TUCHENG

Date: Aug.07,2020 Date of Receipt: Jul.27,2020

Report No.: TAG9G706 Quantity: 1PC Page Order/Pages: (P2/5) Ref. No.: NIL

Report Title: Curie Limited(U3104) Item: Mask

Address: No. 108, Ganhe Rd., Xitun Dist., Taichung City 407, Taiwan

Test Items		Test Results	Test Methods
Synthetic Blood Penetration Pressure:160 mmHg	1	None Seen	ASTM F2100-2019 9.4
	2	None Seen	ASTM F1862-2017
	3	None Seen	
	4	None Seen	
	5	None Seen	
	6	None Seen	
	7	None Seen	
	8	None Seen	
	9	None Seen	
	10	None Seen	
	11	None Seen	
	12	None Seen	
	13	None Seen	
	14	None Seen	
	15	None Seen	
	16	None Seen	

Note: Sample description is given by the client: Brandname: Curie
Model: Curie KV99 Face Mask
Hong Kong address: Unit C, 23F, Tsun Tung Factory Bldg 38-40
Chai Wan Kok St, Tsuen Wan. NT Hong Kong

Note: The test report is the test results issued by the testing institution as requested by the consignor, it shall not determine the legitimacy of the product.

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TTRI 財團法人紡織產業綜合研究所
Taiwan Textile Research Institute

TEST REPORT TUCHENG

Date: Aug.31,2020 Date of Receipt: Aug.24,2020

Report No.: TFF9H599 Quantity: 1PC Page Order/Pages: (P2/5) Ref. No.: NIL

Report Title: Curie Limited(U3104) Item: Mask

Address: No. 108, Ganhe Rd., Xitun Dist., Taichung City 407, Taiwan

Test Items		Test Results	Test Methods
Synthetic Blood Penetration	1	None Seen	EN 14683:2019
Pressure:120 mmHg (16.0 kPa)	2	None Seen	ISO 22609:2004
	3	None Seen	
	4	None Seen	
	5	None Seen	
	6	None Seen	
	7	penetration	
	8	None Seen	
	9	None Seen	
	10	None Seen	
	11	None Seen	
	12	None Seen	
	13	None Seen	
	14	None Seen	
	15	None Seen	
	16	None Seen	

Note: Sample description is given by the client: Brandname: Curie
Model: Curie KV99 Face Mask
Hong Kong address: Unit C, 23F, Tsun Tung Factory Bldg 38-40
Chai Wan Kok St, Tsuen Wan. NT Hong Kong

Note: The test report is the test results issued by the testing institution as requested by the consignor, it shall not determine the legitimacy of the product.

Authorized by president of
Taiwan Textile Research Institute

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Department of Testing and Certification

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TTRI 財團法人紡織產業綜合研究所 Taiwan Textile Research Institute

TEST REPORT TUCHENG

Date: Aug.31,2020 Date of Receipt: Aug.24,2020

Report No.: TFF9H599 Quantity: 1PC Page Order/Pages: (P3/5) Ref. No.: NIL

Report Title: Curie Limited(U3104) Item: Mask

Address: No. 108, Ganhe Rd., Xitun Dist., Taichung City 407, Taiwan

Test Items		Test Results	Test Methods
Synthetic Blood Penetration	17	None Seen	EN 14683:2019
Pressure:120 mmHg (16.0 kPa)	18	None Seen	ISO 22609:2004
	19	None Seen	
	20	None Seen	
	21	None Seen	
	22	None Seen	
	23	None Seen	
	24	None Seen	
	25	None Seen	
	26	None Seen	
	27	None Seen	
	28	None Seen	
	29	None Seen	
	30	None Seen	
	31	None Seen	
	32	None Seen	

Note: Sample description is given by the client: Brandname: Curie

Model: Curie KV99 Face Mask

Hong Kong address: Unit C, 23F, Tsun Tung Factory Bldg 38-40

Chai Wan Kok St, Tsuen Wan. NT Hong Kong

Note: The test report is the test results issued by the testing institution as requested by the consignor, it shall not determine the legitimacy of the product.

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Authorized by president of Taiwan Textile Research Institute

Jui-hung Kao

Director, Department of Testing and Certification

Department of Testing and Certification, Taiwan Textile Research Institute
No.6, Chengtian Rd., Tucheng Dist., New Taipei City 23674, Taiwan (R.O.C.)
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TTRI 財團法人紡織產業綜合研究所 Taiwan Textile Research Institute

TEST REPORT TUCHENG

Date: Aug.07,2020 Date of Receipt: Jul.27,2020

Report No.: TAG9G706 Quantity: 1PC Page Order/Pages: (P3/5) Ref. No.: NIL

Report Title: Curie Limited(U3104) Item: Mask

Address: No. 108, Ganhe Rd., Xitun Dist., Taichung City 407, Taiwan

Test Items		Test Results	Test Methods
Synthetic Blood Penetration	17	None Seen	ASTM F2100-2019 9.4
Pressure:160 mmHg	18	None Seen	ASTM F1862-2017
	19	None Seen	
	20	None Seen	
	21	None Seen	
	22	None Seen	
	23	None Seen	
	24	None Seen	
	25	None Seen	
	26	None Seen	
	27	None Seen	
	28	None Seen	
	29	None Seen	
	30	None Seen	
	31	None Seen	
	32	None Seen	

Note: Sample description is given by the client: Brandname: Curie
Model: Curie KV99 Face Mask
Hong Kong address: Unit C, 23F, Tsun Tung Factory Bldg 38-40
Chai Wan Kok St, Tsuen Wan. NT Hong Kong

Note: The test report is the test results issued by the testing institution as requested by the consignor, it shall not determine the legitimacy of the product.

Note: 1.This report is only responsible for the submitted sample(s), which will be kept for one month period.
2.This report cannot be reproduced in any way, except in full context, without the prior approval in writing of this Department of Testing and Certification.
3.The test report should not be used for public advertisement and commercial promotion.

Authorized by president of Taiwan Textile Research Institute

Jui-hung Kao
Director, Department of Testing and Certification

Department of Testing and Certification, Taiwan Textile Research Institute
No.6, Chengtian Rd., Tucheng Dist., New Taipei City 23674, Taiwan (R.O.C.)
Tel : +886-2-22670321 ext. 7107, 7110
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TTRI 財團法人紡織產業綜合研究所 Taiwan Textile Research Institute

TEST REPORT TUCHENG

Date: Aug.31,2020 Date of Receipt: Aug.24,2020

Report No.: TFF9H598 Quantity: 1PC Page Order/Pages: (P4/5) Ref. No.: NIL

Report Title: Curie Limited(U3104) Item: Mask

Address: No. 108, Ganhe Rd., Xitun Dist., Taichung City 407, Taiwan

Test Items		Test Results	Test Methods
Bacterial Filtration	1	99.9	ASTM F2100-2019 9.1
Efficiency (BFE)(%)	2	99.9	ASTM F2101-2019
Staphylococcus aureus	3	> 99.9	
ATCC 6538	4	99.9	
	5	99.9	

Note: Control average: 2640 CFU.

Note: Mean particle size: 2.8 μm.

Note: Testing side: outside of specimen.

Note: Testing area: 39.5 cm^2.

Note: Flow rate : 28.3 L/min.

Note: Sample description is given by the client: Brandname: Curie
Model: Curie KV99 Face Mask
Hong Kong address: Unit C, 23F, Tsun Tung Factory Bldg 38-40
Chai Wan Kok St, Tsuen Wan. NT Hong Kong

Note: The test report is the test results issued by the testing institution as requested by the consignor, it shall not determine the legitimacy of the product.

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TTRI 財團法人紡織產業綜合研究所 Taiwan Textile Research Institute

TEST REPORT TUCHENG

Date: Aug.31,2020 Date of Receipt: Aug.24,2020

Report No.: TFF9H599 Quantity: 1PC Page Order/Pages: (P4/5) Ref. No.: NIL

Report Title: Curie Limited(U3104) Item: Mask

Address: No. 108, Ganhe Rd., Xitun Dist., Taichung City 407, Taiwan

Test Items		Test Results	Test Methods
Bacterial Filtration	1	> 99.9	EN 14683:2019 Annex B
Efficiency (BFE)(%)	2	99.9	
Staphylococcus aureus	3	99.9	
ATCC 6538	4	> 99.9	
	5	99.9	

Note: Control average: 2640 CFU.

Note: Mean particle size: 2.8 μm.

Note: Testing side: outside of specimen.

Note: Testing area: 39.5 cm^2.

Note: Flow rate : 28.3 L/min.

Note: Sample description is given by the client: Brandname: Curie

Model: Curie KV99 Face Mask

Hong Kong address: Unit C, 23F, Tsun Tung Factory Bldg 38-40

Chai Wan Kok St, Tsuen Wan. NT Hong Kong

Note: The test report is the test results issued by the testing institution as requested by the consignor, it shall not determine the legitimacy of the product.

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TTRI 財團法人紡織產業綜合研究所 Taiwan Textile Research Institute

TEST REPORT TUCHENG

Date: Aug.07,2020 Date of Receipt: Jul.27,2020

Report No.: TFF9G707 Quantity: 1PC Page Order/Pages: (P5/6) Ref. No.: NIL

Report Title: Curie Limited(U3104) Item: Mask

Address: No. 108, Ganhe Rd., Xitun Dist., Taichung City 407, Taiwan

Test Items		Test Results	Test Methods
Microbial cleanliness (cfu/g)	1	13.7	EN 14683:2019 EN ISO 11737-1:2018
	2	10.6	
	3	4.4	
	4	10.1	
	5	11.0	

Note: Sample description is given by the client: Brandname: Curie
Model: Curie KV99 Face Mask
Hong Kong address: Unit C, 23F, Tsun Tung Factory Bldg 38-40
Chai Wan Kok St, Tsuen Wan. NT Hong Kong

Note: The test report is the test results issued by the testing institution as requested by the consignor, it shall not determine the legitimacy of the product.

Note: 1.This report is only responsible for the submitted sample(s), which will be kept for one month period.
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Bacterial Filtration Efficiency (BFE) in ASTM F2101

Proven that OOH SHIELD technology can effectively filter bacteria (>99%)

香港公開大學
THE OPEN UNIVERSITY OF HONG KONG
政府創辦，多元創新
Government established · Diversified and innovative

TEST REPORT

Applicant: Curie Limited
Room C, 23/F,
Tsuen Tung Factory Building,
38-40 Chai Wan Kok Street,
Tsuen Wan,
New Territories,
Hong Kong

Report number: IRITS202005150001

Date: 15 May 2020

Attn.: Aldrin Or

Sample Description as Declared:

No. of Sample:	TWO (2) pieces of received material in zipper bag packaging
Sample Description:	Curie Ultrahigh- Efficiency Viral Filter
Colour:	White
Date Received:	8 May 2020
Testing Period:	9 – 14 May 2020
Tests Conducted:	As requested by the Applicant, with the details as follow:

Testing Summary: The sample being tested was conditioned for a minimum of 4 hour at 21 ± 5 °C and relative humidity of 65 ± 5 %. The bacterial filtration efficiency (BFE) test was performed by applying a spray of challenge bacterium *Staphylococcus aureus* in peptone water (approximately 2,200 colony forming units per spray) using a trigger sprayer. The sprayed aerosol was then drawn through the material being tested following by a tryptic soy agar plate under vacuum (flow rate: 100 Litres per minute). Number of *Staphylococcus aureus* colonies formed on the tryptic soy agar plate were counted after incubated at 37 ± 2 °C for 48 ± 4 hr. The BFE test procedure was modified from ASTM F2101: 2019.

For and on behalf of
Institute for Research in Innovative Technology & Sustainability
The Open University of Hong Kong

Dr. Eric Tung-po Sze
Director

香港九龍何文田 電話：(852) 2711 2100 電子郵遞：info@ouhk.edu.hk
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Report number: IRITS202005150001

Date: 15 May 2020

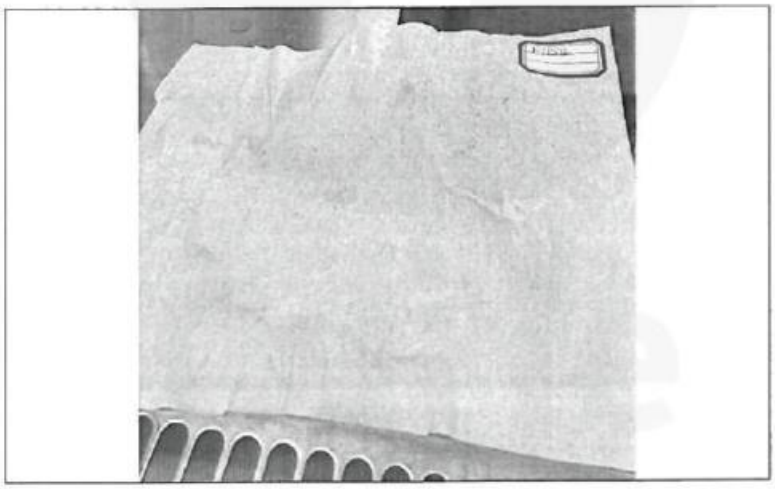
Results:

Test Sample Number

Test Sample Number	Bacterium Colonies Formed
#1	N.D.[a]
#2	N.D.[a]
Negative Control	N.D.[a]

[a] None Detected (N.D.) – There were no detected bacterium colony of *Staphylococcus aureus* found.

Sample Photo:



<End of Test Report>

Standard Guide for Accelerated Ageing of Sterile Barrier Systems for Medical Devices in ASTM F1980-16
Bacterial Filtration Efficiency (BFE) in ASTM F2101

Proven that OOH SHIELD technology can effectively filter bacteria (>99%), after conditioning KV99.81 masks in 120°C for 48 hours, to simulate storing in room temperature for 5 years

香港公開大學
THE OPEN UNIVERSITY OF HONG KONG
科技學院 School of Science and Technology

TEST REPORT

Applicant: Curie Limited
Room C, 23/F,
Tsuen Tung Factory Building,
38-40 Chai Wan Kok Street,
Tsuen Wan,
New Territories,
Hong Kong

Report number: IRITS2020007030001

Date: 3 July 2020

Attn.: Aldrin Or

Sample Description as Declared:

No. of Sample:	TWO (2) pieces of composite material for face mask in zipper bag packaging Curie KV99
Colour:	White
Date Received:	15 June 2020
Testing Period:	16 – 24 June 2020
Tests Conducted:	As requested by the Applicant, with the details as follow:

Testing Summary: The sample(s) were conditioned at an acceleration temperature of 120 °C for 48 hours, followed by pre-conditioning at a minimum of 4 hour at 21 ± 5 °C and relative humidity of 65 ± 5 %. Bacterial filtration efficiency (BFE) test was then performed by spraying the samples with an aerosol of challenge bacterium *Staphylococcus aureus* in peptone water using a nebulizer. The aerosol was then drawn through the samples following by a tryptic soy agar plate under vacuum (flow rate: 100 Litres per minute). Number of *Staphylococcus aureus* colonies formed on the tryptic soy agar plate were counted after incubated at 37 ± 2 °C for 48 ± 4 hr. The BFE test procedure was modified from ASTM F2101: 2019.

For and on behalf of
Institute for Research in Innovative Technology & Sustainability
The Open University of Hong Kong

Dr. Eric Tung-po Sze

香港公開大學
THE OPEN UNIVERSITY OF HONG KONG
科技學院 School of Science and Technology

Report number: IRITS2020007030001

Date: 3 July 2020

Results:

Test Sample Number	Bacterium Colonies Formed	Bacterial Filtration Efficiency
#1	N.D.[a]	> 99 %
#2	N.D.[a]	> 99 %
Negative Control	N.D.[a]	N/A[b]

[a] None Detected (N.D.) – There were no detected bacterium colony of *Staphylococcus aureus* found

[b] N/A – Not Applicable

Remark: The time and temperature selected for the acceleration conditioning were based on ASTM Standard F1980-16 Appendix X1. Accelerated aging of polymers, which are equivalent to five year of room-temperature (20 °C) aging, with an aging factor Q_{10} = 2.0.

Sample Photos:

<End of Test Report>

Determination of Antibacterial Activity of Textile Products BS EN ISO 20743

Proven that OOH SHIELD technology can effectively kill bacteria (>99%) · In less than 60 seconds.

香港公開大學
THE OPEN UNIVERSITY OF HONG KONG
科技學院 School of Science and Technology

TEST REPORT

Applicant: Curie Limited
Room C, 23/F,
Tsuen Tung Factory Building,
38-40 Chai Wan Kok Street,
Tsuen Wan,
New Territories,
Hong Kong

Report number: IRITS2020007130001R1

Date: 23 July 2020

Attn.: Aldrin Or

Sample Description as Declared:

No. of Sample:	ONE (1) piece of textile material in zipper bag packaging said to be RT-2007-T0430-DC020
Colour:	White
Date Received:	21 May 2020
Testing Period:	2 – 10 July 2020
Tests Conducted:	As requested by the Applicant to determine the antibacterial activity of the sample with reference to BS EN ISO 20743: 2013 Clause 8.2 Transfer method, with the following deviation:

- Shake-out the bacteria from specimens using peptone water instead of neutralizing solution.

For and on behalf of
Institute for Research in Innovative Technology & Sustainability
The Open University of Hong Kong

Dr. Eric Tung-po Sze
Director

香港公開大學
THE OPEN UNIVERSITY OF HONG KONG
科技學院 School of Science and Technology

Report number: IRITS2020007130001R1

Date: 23 July 2020

Results:

Specimen	**Conditions**	Number of bacteria[a] (CFU per specimen)
#1	Shake-out before incubation	0
#2	Shake-out after incubation	0

[a]1 millilitre of an inoculum of *Staphylococcus aureus* with concentration of 1×10^6 CFU/ml to 3×10^6 CFU/ml was applied onto an agar plate in the transfer method, where each specimen was set on the agar surface and weigh down with a 200 g stainless-steel cylinder for 60 s ± 5 s to transfer the microbial content. Incubation Measurement of the number of bacteria colonies was conducted in accordance with the plate count method specified in Annex C of BS EN ISO 20743:2013.

Opinion(s) and Interpretation(s): Based on the results obtained above, the specimens demonstrated effective antibacterial property to kill bacteria during transfer phase of the experiment.

Note: This Report replaces Report number IRITS2020007130001, which has been obsoleted.

<End of Test Report>

Determination of Antiviral Activity of Textile Products BS ISO 18184

Proven that OOH SHIELD technology can effectively kill Influenza A Virus Subtype H3N2 (>99.99%)

广微测 Gmicro Testing

中国认可 国际互认 检测 TESTING CNAS L1747

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

REPORT FOR ANALYSIS

Report №.	2020FM20686R01E
Name of Sample	Curie Ultrahigh-Efficiency Viral Filter for KV-99
Applicant	Shenzhen Qianhai e-Cycle Trading Co.,Ltd.
Test Type	Entrustment Test

Address: Building 66, No.100 Central Xian Lie Road, Guangzhou, China

Postcode: 510070

Tel: +86 20 87137666

Fax : +86 20 87137668

Website : www.gddcm.com

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

REPORT FOR ANALYSIS

Report №.:2020FM20686R01E Verification Code: 03658924

Name of Sample	Curie Ultrahigh-Efficiency Viral Filter for KV-99	Test Type	Entrustment Test
Applicant	Shenzhen Qianhai e-Cycle Trading Co.,Ltd.	Address	2/F,Building B2，Yintian Industrial Area，Xixiang Street，Baoan District，Shenzhen Guangdong，China
Sample Source	Submitted for Testing by the Applicant	Sample Quantity	260cm*2m
Spec and Lot № of Sample	40g;1001	State and Characteristic	Flaky
Sample Received Date	2020-07-15	Test Completion Date	2020-07-28
Test Standard and Method	ISO 18184：2014（E）		
Item Tested	Antiviral activity test		
Test Conclusion	The test data of the sample(s) is attached to the page(s) of this report. Issue Date：2020-08-13 (Official Seal)		
Remarks	1.Manufacturer: Curie Limited. (provided by the applicant) 2.Trademark: Curie; The date of production: 2020-06-01. (provided by the applicant)		

Editor: Chen Yingxing **Verifier:** Li Suquan **Approver:** Xie Xiaobao

GUANGDONG DETECTION CENTER OF MICROBIOLOGY

ANALYSIS AND TEST RESULT

Report №.: 2020FM20686R01E

Virus and host cell	No.	The logarithm of infectivity titre value immediate after inoculation of the reference specimen ($lgTCID_{50}$/bottle)	The logarithm of infectivity titre value after 2h contacting with the reference specimen ($lgTCID_{50}$/ bottle)	The logarithm of infectivity titre value after 2h contacting with the test specimen ($lgTCID_{50}$/ bottle)
H3N2 *Influenza A virus* Host cell: MDCK	1	7.05	6.50	2.10
	2	6.97	6.63	2.30
	3	7.10	6.59	2.30
$lgTCID_{50}$/ bottle Average		7.04	6.57	2.33
Logarithm of antiviral activity		4.34		
Antiviral activity rate（%）		99.99		

（Blank below）

Notice Items

1. The Test report is invalid if not affixed with Authorized Stamp of Test and Paging Seal.
2. The Test report is invalid without signature of verifier and approver.
3. The Test report is invalid if being supplemented, deleted or altered.
4. Without prior written permission, the report cannot be reproduced, except in full.
5. Unless otherwise stated, the results shown in this test report refer only to the sample(s) submitted.
6. Any dispute of the report must be raised to the testing body within 15 days after the report is received, exceeding which the dispute will not be accepted。
7. For the tested sample(s) submitted by the applicant, the sample information in the test report is provided by the applicant and the laboratory is not responsible for its authenticity.

Determination of alkylphenols (AP) of Textile Products EN ISO 21084:2019

Proven that Alkylphenols (AP) is not detected from OOH SHIELD technology

Detection and Determination of Alkylphenol Ethoxylates (APEO) of Textile Products EN ISO 18254:2016

Proven that Alkylphenol Ethoxylates (APEO) is not detected from OOH SHIELD technology

TEST RESULT

Alkylphenols (AP) Content Test

Test Method I : For Textile & Leather:
EN ISO 21084

Test Method II : For Polymers and other materials:
Organic solvent extraction, analysis with reference to EN ISO 21084.

Tested Item(s) : I001 White fabric with transparent adhesive

Maximum Limit:	**100 mg/kg (sum)**

Tested Item(s)	**Test Method**	**Result**			**Conclusion**
		Detected Analyte(s)	**Conc.**	**Unit**	
I001	I	ND	ND	mg/kg	PASS

Note:
ND = Not detected ">" = More than Conc. = Concentration
ppm = part(s) per million = mg/kg mg/kg = milligram(s) per kilogram
Reporting Limit (mg/kg) : Sum (OP & NP) : 10

Remark:
- The list of alkylphenols is summarized in table of Appendix.

Alkylphenol Ethoxylates (APEO) Content Test

Test Method I : For Textile and Other materials:
With reference to EN ISO 18254-1, analysis by Liquid Chromatograph Mass Spectrometer (LC-MS)

Test Method II : For Leather:
With reference to EN ISO 18218-1 and EN ISO 18254-1

Tested Item(s) : I001 White fabric with transparent adhesive

Maximum Limit:	**Others: 100 mg/kg (Sum)** **Recycled materials: 1000 mg/kg (Sum)**

Tested Item(s)	**Test Method**	**Result**			**Conclusion**
		Detected Analyte(s)	**Conc.**	**Unit**	
I001	I	ND	ND	mg/kg	PASS

Note:
ND = Not detected ">" = More than Conc. = Concentration
ppm = part(s) per million = mg/kg mg/kg = milligram(s) per kilogram
Reporting Limit (mg/kg) : Sum (OPEOs & NPEOs) : 20

Remark:
- The list of alkylphenol ethoxylates is summarized in table of Appendix.

Determination of Formaldehyde - Free and Hydrolysed Formaldehyde of Textile Products

EN ISO 14184:2011 / JIS L 1041

Proven that Formaldehyde is not detected from OOH SHIELD technology, and it reach safety level for Type 1 – Baby < 36 Months

TEST RESULT

Formaldehyde Content Test

Test Method I : Textiles & Other Materials: EN ISO 14184-1
Test Method II : Leather: ISO 17226:2 and/or ISO 17226-1
Test Method III : Glue & 0-3 years old products: JIS L 1041: 2011 Method A
Test Method IV : Carpets and mats: GB 18587 Grade B.

Tested Item(s) : I001 White fabric with transparent adhesive

Maximum Limit:	**Type I**	**For baby < 36 months: 16 mg/kg**
	Type II	**Others: 75 mg/kg**
	Type III	**Carpets and mats : < 0.050 mg/m²/h**

Tested Item(s)	Type	Test Method	Result	Unit	Conclusion
I001	I	III	ND	mg/kg	PASS

Note:
ND = Not detected ">" = More than
ppm = part(s) per million = mg/kg mg/kg = milligram(s) per kilogram
Reporting Limit : 16 mg/kg (Method I, II, III), 0.050 mg/m²/h (Method IV)

Determination of Tetrachlorophenol-, Trichlorophenol-, Dichlorophenol-, Monochlorophenol-Isomers and Pentachlorophenol Content of Textile Products

DIN EN ISO 17070:2015 / 64 LFBG B 82.02-08 (Modified)

Proven that Chlorophenols Content and Ortho-Phenylphenol (OPP) are not detected from OOH SHIELD technology

TEST RESULT

Chlorophenols Content Test

Test Method : With reference to ISO 17070:2015 or 64 LFBG B 82.02-08 (Modified). Potassium hydroxide extraction, derivatisation and analysis by Gas Chromatograph Mass Spectrometer (GC-MS).

Tested Item(s) : I001 White fabric with transparent adhesive

Maximum Limit:	**0.5 mg/kg (Each)**

Tested Item(s)	**Result**			**Conclusion**
	Detected Analyte(s)	**Conc.**	**Unit**	
I001	ND	ND	mg/kg	PASS

Note:
ND = Not detected
ppm = part(s) per million = mg/kg
Reporting Limit (mg/kg) : Each : 0.5
">" = More than
mg/kg = milligram(s) per kilogram

Remark:
- The list of chlorophenols is summarized in table of Appendix.

Ortho-phenylphenol (OPP) Test

Test Method : 1 M KOH extraction, 16 hours at 90 degrees C, derivatization and analysis § 64 LFGB B 82.02-08 or DIN EN ISO 17070:2015.

Tested Item(s) : I001 White fabric with transparent adhesive

Maximum Limit:	**1000 mg/kg**

Tested Item(s)	**Result**	**Unit**	**Conclusion**
I001	ND	mg/kg	PASS

Note:
ND = Not detected
ppm = part(s) per million = mg/kg
Reporting Limit (mg/kg) : 100
">" = More than
mg/kg = milligram(s) per kilogram

Determination of the Phthalate Content of Textile Products EN ISO 14389: 2014 / US CPSC-CH-C1001-09.4

Proven that Phthalate Content are not detected from OOH SHIELD technology

Phthalates Content Test

Test Method I : Textile: CPSC-CH-C1001-09.4 and EN ISO 14389: 2014.

Test Method II : Others: CPSC-CH-C1001-09.4, analysis by Gas Chromatograph Mass Spectrometer (GC-MS).

Tested Item(s) : I001 White fabric with transparent adhesive

Maximum Limit:	**500 mg/kg (Each)** **1000 mg/kg (Sum)**

Tested Item(s)	Test method	Result			Conclusion
		Detected Analyte(s)	Conc.	Unit	
I001	I	ND	ND	mg/kg	PASS

Note:

ND = Not detected
ppm = part(s) per million = mg/kg
Reporting Limit (mg/kg) : Each : 50

">" = More than
mg/kg = milligram(s) per kilogram

Conc. = Concentration

Remark:

- The list of phthalates is summarized in table of Appendix.

全国发明展览会

NATIONAL EXHIBITION OF INVENTIONS

获奖证书

AWARD CERTIFICATE

项目编号：C9093　　证书编号：2903210　　国科奖社证字第0123号

发 明 者：龚剑亮 柯俊贤

完成单位：零电池电子有限公司

项目名称：自清洁、自消杀、自充电3S多功能高效空气过滤净化材料技术

该项目在第二十四届全国发明展览会上荣获“发明创业奖·项目奖”铜奖，特颁此证予以表彰。

中国发明协会

2020年11月

Bronze Award of National Exhibition of Inventions, China Association of Inventions