Test Report

No.T32220270493SN Date: Jun 14, 2022

MASKON LIMITED

ROOM C, 16/F, MG TOWER, 133 HOI BUN ROAD, KWUN TONG, KOWLOON, HONG KONG

The following samples were submitted and identified by/on behalf of the client as:

3D MASK

Case No.	:	CA322202736079
Lot No. / Batch Code	:	NOT PROVIDED
Sample Description	:	LIGHT BROWN, GREEN, GRAY, PINK MASK
Colour	:	HAZY, ALOOF, JAUNTY, SPUNKY
Manufacturer	:	MASKON LIMITED
Country of Origin	:	HONG KONG
Sample Receiving Date	:	MAY 25, 2022
Testing Period	:	MAY 25, 2022 – JUN 13, 2022

Test Requested	Conclusion
ASTM F2100-19 Standard Specification for Performance of Materials Used in Medical Face Masks (Selected test part as specified by client)	PASS (Level 3)
Flammability Test of Clothing Textiles (16 CFR Part 1610 - October 20, 2008 Edition)	PASS

******** FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S) ********

Signed for and on behalf of
SGS Hong Kong Ltd.

Au Kam Chi, Gigi
Technical Manager

Signed for and on behalf of
SGS Hong Kong Ltd.

Tsang Chuk Hai
Senior Microbiologist

Test Results:

ASTM F2100-19 Standard Specification for Performance of Materials Used in Medical Face Masks

Scope : This specification covers testing and requirements for materials used in the construction of medical face masks that are used in providing healthcare services such as surgery and patient care. This specification provides for the classification of medical face mask material performance.

Number of Specimen : 120 pcs of complete product (Light Brown Mask)

Clause	Test Items/requirement	Test Result Summary
5	**Classification**	See Table 1
6	**Requirements**	
6.1	The properties of the medical face mask material shall conform to the specifications requirements in Table 1, as tested in accordance with Section 9.	
	^Bacterial filtration efficiency (ASTM F2101)	> 98%
	^Differential pressure (EN 14683:2019 Annex C)	< 6.0 mm H_2O/cm^2
	^Sub-Micron Particulate Filtration (ASTM F2299)	> 98%
	Resistance to penetration by synthetic blood (ASTM F1862)	Penetration not seen at 160 mm Hg
6.2	^Flammability 16 CFR Part 1610	Class 1

Note:

^ Results of compliance for tests requested is justified according to decision rule based on the non-binary statement with guard band (is equal to the expanded measurement uncertainty with a 95% coverage probability, $w = U_{95}$) as stated in ILAC-G8:09/2019 Clause 4.2.3.
"Pass - The measured values were observed in tolerance at the points tested. The specific false accept risk is up to 2.5%.".
"Fail - One or more measured values were observed out of tolerance at the points tested". The specific false reject risk is up to 2.5%.

Table 1 Medical Face Mask Material Requirements by Performance Level

Characteristics	Level 1 Barrier	Level 2 Barrier	Level 3 Barrier
Bacterial filtration efficiency, %	≥ 95	≥ 98	≥ 98
Differential pressure, mm H_2O/cm^2	< 5.0	< 6.0	< 6.0
Sub-micron particulate filtration efficiency at 0.1 micron, %	≥ 95	≥ 98	≥ 98
Resistance to penetration by synthetic blood, minimum pressure in mm Hg for pass result#	80	120	160
Flame spread	Class 1	Class 1	Class 1

- An acceptable quality limit of 4,0 % is met for a single sampling plan when 29 or more of the 32 tested specimens show "pass" results.

Result 1 Bacterial filtration efficiency ASTM F2101-19

Test Side	:	Light brown colour without earloop (Inside)
Pre-Conditioning	:	Minimum of 4 hours at 21±5°C and 85±5% R.H.
Dimensions of test specimen	:	248 mm x 146 mm
BFE Test Area	:	49 cm^2
BFE Flow Rate	:	28.3 l/min
Test bacteria	:	Staphylococcus aureus ATCC 6538
Mean Particle Size	:	2.8 μm
Positive Control Average	:	2.2 x 10^3 CFU
Negative Monitor Count	:	< 1 CFU

Test Specimen	Total plate count per stage						Percent BFE (%)
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	
1	0	0	0	0	0	0	99.9%
2	0	0	0	0	0	0	99.9%
3	0	0	0	0	0	0	99.9%
4	0	0	0	0	0	2	99.9%
5	0	0	0	0	0	0	99.9%

Result 2 Differential pressure EN14683:2019+AC:2019 Appendix C

Test Side	:	Light brown colour without earloop (Inside)
Pre-Conditioning	:	Minimum of 4 hours at 21±5°C and 85±5% R.H.
Test Area	:	4.9 cm^2
Flow Rate	:	8 l/min

Test Location	ΔP (mm H_2O/cm^2)				
	Specimen 1	Specimen 2	Specimen 3	Specimen 4	Specimen 5
Top Centre	2.2	2.2	2.0	2.1	2.3
Centre	2.0	1.8	2.2	2.5	2.4
Bottom Centre	2.7	2.7	2.7	2.7	2.6
Centre Left	2.8	2.9	3.1	3.5	2.8
Centre Right	2.6	2.9	2.6	2.6	2.7
Average	2.5	2.5	2.5	2.7	2.6

Result 3 Determining the Initial Efficiency of Materials Used in Medical Face Masks to Penetration by Particulates Using Latex Spheres (ASTM F2299/F2299M-03 (Reapproved 2017))

Test Side	:	Light brown colour with earloop (Outside)
Pre-Conditioning	:	Minimum of 4 hours at 21±3°C and 30-50±5% R.H.
Test Condition	:	21±3°C and 50±5% R.H.
Test Area	:	41.61 cm^2
Face Velocity	:	9.72 cm/s
Particle Size	:	0.1 μm (+/-7.5% CV) Latex Microspheres
Average Filtration Efficiency	:	99.73%
Standard Deviation	:	0.023

Test Specimen	Pressure Drop (inH_2O)	Downstream Particle Count	Upstream Particle Count	Filtration Efficiency
1	0.196	1020	339430	99.70%
2	0.198	954	348475	99.73%
3	0.244	904	357009	99.75%
4	0.211	787	327758	99.76%
5	0.217	850	308254	99.72%

Note: The procedure incorporated a non-neutralized challenge. The non-neutralized aerosol is also specified in the FDA guidance document on surgical face masks.

Result 4 Resistance to penetration by synthetic blood ASTM F1862/F1862M-17

Test Side	:	Light brown colour with earloop (Outside)
Pre-Conditioning	:	4 hours at 21±5°C and 85±5% R.H.
Test Condition	:	21±5°C and 85±10% R.H.
Test Pressure	:	160 mmHg
No of Test Specimen Tested	:	32
No of Test Specimen Passed	:	31

Test Specimen #	Synthetic Blood Penetration
1-13, 15-32	None Seen
14	Yes

Note: Sample was tested in the stage of spreading the pleats out when mounted on the test fixture.

Result 5 Flammability Test of Clothing Textiles (16 CFR Part 1610 - October 20, 2008 Edition)

Test specimen : Fabric cut from submitted sample
Fabric Surface : Plain (Face)
Test Specimen Direction : Length

	As Received	
	Flame Spread (sec.)	Burn Code
(1)	--	DNI
(2)	--	DNI
(3)	--	DNI
(4)	--	DNI
(5)	--	DNI
Flammability Classification:		Class 1
Requirement:		Class 1

Remarks:

1. **Class 1 – Normal Flammability**
   Class 1 textiles exhibit normal flammability and are acceptable for use in clothing.
   Test Criteria for plain surface textile fabric:
   (A) There are no burn times; or
   (B) There is only one burn time and it is equal to or greater than 3.5 seconds; or
   (C) The average burn time of two or more specimens is equal to or greater than 3.5 seconds.
2. Disposable fabrics and garments shall not apply to be refurbished before testing.

Burn Code Description:

DNI = Did not ignite

Flammability Test of Clothing Textiles (16 CFR Part 1610 - October 20, 2008 Edition)

Green Mask

Test specimen : Fabric cut from submitted sample
Fabric Surface : Plain (Face)
Test Specimen Direction : Length

	As Received	
	Flame Spread (sec.)	Burn Code
(1)	--	DNI
(2)	--	DNI
(3)	--	DNI
(4)	--	DNI
(5)	--	DNI
Flammability Classification:		Class 1
Requirement:		Class 1

Remarks:

1. **Class 1 – Normal Flammability**
   Class 1 textiles exhibit normal flammability and are acceptable for use in clothing.
   Test Criteria for plain surface textile fabric:
   (A) There are no burn times; or
   (B) There is only one burn time and it is equal to or greater than 3.5 seconds; or
   (C) The average burn time of two or more specimens is equal to or greater than 3.5 seconds.
2. Disposable fabrics and garments shall not apply to be refurbished before testing.

Burn Code Description:

DNI = Did not ignite

Flammability Test of Clothing Textiles (16 CFR Part 1610 - October 20, 2008 Edition)

Grey Mask

Test specimen : Fabric cut from submitted sample
Fabric Surface : Plain (Face)
Test Specimen Direction : Length

	As Received	
	Flame Spread (sec.)	Burn Code
(1)	--	DNI
(2)	--	DNI
(3)	--	DNI
(4)	--	DNI
(5)	--	DNI
Flammability Classification:		Class 1
Requirement:		Class 1

Remarks:

1. **Class 1 – Normal Flammability**
   Class 1 textiles exhibit normal flammability and are acceptable for use in clothing.
   Test Criteria for plain surface textile fabric:
   (A) There are no burn times; or
   (B) There is only one burn time and it is equal to or greater than 3.5 seconds; or
   (C) The average burn time of two or more specimens is equal to or greater than 3.5 seconds.
2. Disposable fabrics and garments shall not apply to be refurbished before testing.

Burn Code Description:

DNI = Did not ignite

Flammability Test of Clothing Textiles (16 CFR Part 1610 - October 20, 2008 Edition)

Pink Mask

Test specimen : Fabric cut from submitted sample
Fabric Surface : Plain (Face)
Test Specimen Direction : Length

	As Received	
	Flame Spread (sec.)	Burn Code
(1)	--	DNI
(2)	--	DNI
(3)	--	DNI
(4)	--	DNI
(5)	--	DNI
Flammability Classification:		Class 1
Requirement:		Class 1

Remarks:

1. **Class 1 – Normal Flammability**
   Class 1 textiles exhibit normal flammability and are acceptable for use in clothing.
   Test Criteria for plain surface textile fabric:
   (A) There are no burn times; or
   (B) There is only one burn time and it is equal to or greater than 3.5 seconds; or
   (C) The average burn time of two or more specimens is equal to or greater than 3.5 seconds.
2. Disposable fabrics and garments shall not apply to be refurbished before testing.

Burn Code Description:

DNI = Did not ignite

Sample Photo:

SGS authenticate the photo on original report only

*** End of Report ***