Cambridge
materials testing limited

6991 Millcreek Drive, Unit 13
Mississauga, Ontario L5N 6B9
Tel: (905) 812-3856 Fax: (905) 812-3866
www.cambridgematerials.com

Report For:	Breathe Medical Manufacturing Limited #110-250 Beaver Lake Road Kelowna, British Columbia V4V 1S7 Phone: 778 870 2603 Email: shane@breathemedical.ca	**Laboratory #:** **Report Date:** **Received Date:**	841570A-20 REVISED August 24, 2020 August 4, 2020
Attention:	Shane Broesky		
Specimen:	#1: Medical Masks, Description: Surgical Mask ASTM Level 3, Code: SM99-L3-BR		

TEST REPORT

One specimen, consisting of Medical Masks, was submitted to be tested for bacteria filtration efficiency, differential pressure, synthetic blood penetration and flame spread.

SYNTHETIC BLOOD PENETRATION

ASTM F1862/F1862M-17 at 160 mmHg pressure

RESULTS

Specimen #	Test Pressure (mmHg)	Total Number of Specimens	Number of Pass Specimens
1	160	32	29

Material construction type	Not provided/Unknown
Supplier	Not provided/Unknown
Lot number	Not provided/Unknown
Date of receipt	August 4, 2020
Date of test	August 7, 2020
Fluid velocity (cm/s)	639
Volume of impact fluid (ml)	2
Angle of pneumatic valve to horizontal	2°
Description target area mask	Blue ripple area
Distance from tip cannula to mask (in)	12
Technique to enhance visual detection	Cotton swab used to lightly daub on the surface
Conditioning parameters	21±5°C, 85±5% R.H for minimum of 4 hours

Revision: Added description and product code.
Revision Date: August 24, 2020

This report is subject to the following terms and conditions: 1. This report relates only to the specimen provided and there is no representation or warranty that it applies to similar substances or materials or the bulk of which the specimen is a part. 2. The content of this report is for the information of the customer identified above only and it shall not be reprinted, published or disclosed to any other party except in full. Prior written consent from Cambridge Materials Testing Limited is required. 3. The name Cambridge Materials Testing Limited shall not be used in connection with the specimen reported on or any substance or materials similar to that specimen without the prior written consent of Cambridge Materials Testing Limited. 4. Neither Cambridge Materials Testing Limited nor any of its employees shall be responsible or held liable for any claims, loss or damages arising in consequence of reliance on this report or any default, error or omission in its preparation or the tests conducted. 5. Specimens are retained 6 months, test reports and test data are retained 7 years from date of final test report and then disposed of, unless instructed otherwise in writing. 6. When making a statement of conformity to a specification or standard the report will make the statement of conformity based on the absolute value of the test result. Test Report Template Revision August 20, 2019

Cambridge Materials Testing Limited

Per Steve Brown
Authorized By Stephen Brown

Per Anamaria Rojas Pineda.
Technician, Anamaria Rojas-Pineda

Cambridge
materials testing limited

6991 Millcreek Drive, Unit 13
Mississauga, Ontario L5N 6B9
Tel: (905) 812-3856 Fax: (905) 812-3866
www.cambridgematerials.com

Laboratory # 841570A-20
Breathe Medical Manufacturing Limited

DIFFERENTIAL PRESSURE

EN 14683:2019 edition Annex C
Each specimen was conditioned for 4 hours minimum at 21+/-5 C and 85+/-5 % R.H.

RESULTS

Specimen ID	Area ID	Differential Pressure (mmH2O/cm^2)
1	1	5.3
	2	5.0
	3	5.2
	4	4.7
	5	6.1
	AVERAGE	5.3
2	1	5.6
	2	4.7
	3	4.9
	4	5.0
	5	5.5
	AVERAGE	5.1
3	1	5.6
	2	5.1
	3	4.9
	4	5.6
	5	6.1
	AVERAGE	5.4
4	1	5.7
	2	4.7
	3	5.6
	4	5.7
	5	5.5
	AVERAGE	5.4
5	1	4.7
	2	4.8
	3	5.4
	4	5.8
	5	4.6
	AVERAGE	5.1

Mask Surface Area: 25mm diameter (x5 test areas) (4.9 cm^2)
Air Flow Rate: 8 L/min
Mask Location Specimen taken from: 5 Areas from each specimen distributed all surface wide

Cambridge
materials testing limited

6991 Millcreek Drive, Unit 13
Mississauga, Ontario L5N 6B9
Tel: (905) 812-3856 Fax: (905) 812-3866
www.cambridgematerials.com

Laboratory # 841570A-20
Breathe Medical Manufacturing Limited

FLAME SPREAD

The specimen, consisting of 5 masks, was tested in accordance to 16 CFR 1610 (1-1-16 Edition).

	Specimen #	RESULT	CONCLUSION
Specimen #1	1-1	IBE	**Classified as Class 1**
	1-2	IBE	
	1-3	IBE	
	1-4	IBE	
	1-5	IBE	

IBE: Ignited but extinguished

Test: Flame Resistance 45˚ angle test. One-Second Flame Impingement.
Type of fabric: Without a raised fiber surface
Surface tested: Face
Type of test: Original State
Direction tested: Length
Testing Conditioning: Specimens conditioned at 105°C for 30 min, then placed in desiccator
Requirements: The flame spread time for textile products without a raised fibre surface must be greater than 3.5 seconds.

Cambridge
materials testing limited

6991 Millcreek Drive, Unit 13
Mississauga, Ontario L5N 6B9
Tel: (905) 812-3856 Fax: (905) 812-3866
www.cambridgematerials.com

Laboratory # 841570A-20
Breathe Medical Manufacturing Limited

BACTERIA FILTRATION EFFICIENCY (BFE)

Testing performed by GAP EnviroMicrobial Services Ltd., 1020 Hargrieve Road, Unit 14, London, Ontario, Canada, N6E 1P5

A Bacterial Filtration Efficiency (BFE) test was completed according to the procedure in ASTM F2101-19 to determine the filtration efficiency of test articles by comparing the bacterial control counts upstream of the test article to the bacterial counts recovered downstream. A suspension of *S. aureus* was aerosolized using a nebulizer and delivered to the test article at a constant rate with a target delivery rate of $1.7 \times 10^3 - 3.0 \times 10^3$ colony forming units (CFU) per test article with a mean particle size of 3.0 ± 0.3 µm. The aerosolized suspension was drawn through the test article which was clamped in a six stage Andersen air sampler, at a constant flow rate of 28.3 liters per minute (LPM), for collection on bacteriological agar plates.

Challenge Microbe: *Staphylococcus aureus* ATCC 6538
Test Side: User side facing challenge
Area Tested: ~38.5 cm^2
Flow Rate: 28.3 LPM
Test Article Conditioning: 85 ± 5% RH at 25.0 ± 0.5°C for a minimum of 4 hours
Challenge Level: 1.944×10^3 CFU
Mean Particle Size: 2.73 µm

RESULTS

Specimen #	Total CFU Recovered	Percent BFE (%)
1-1	3	99.85
1-2	2	99.90
1-3	2	99.90
1-4	1	99.95
1-5	2	99.90

The filtration efficiency percentages were calculated using the following equation:

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

C = Challenge Level
T = Total CFU recovered downstream of test article

Analytical and Environmental Services Laboratory

Test Report

Report Number: 20-PPE-00109
Version: 1
Report Date: 24-Aug-2020

Attn: Shane Broesky
Breathe Medical Manufacturing Ltd.
#110 - 250 Beaver Lake Road
Kelowna, BC
V4V 1S7
Purchase Order: PAID

Sample(s) received: 20-Aug-2020

Authorized by:

Rob Taylor
Service Line Leader - Analytical Chemistry
Rob.Taylor@kinectrics.com

Description: PPE FILTER FOR ASTM F2299 (PFE) ANALYSIS. Description: Surgical Mask ASTM Level 3. Product Code: SM99-L3-BR

Sample ID	Sample Name	Matrix	Sample Point	Sample Date
20-PPE-00109-1	202000728-01-04-0800	Medical Mask		19-Aug-2020

Special Instructions: ANALYZE AT FACE VELOCITY OF 5 cm/s

Version comment: Initial report.

This test report shall not be reproduced except in full without written authorization of Kinectrics Inc.

Analytical and Environmental Services Laboratory

Test Report

Report Number: 20-PPE-00109
Version: 1
Report Date: 24-Aug-2020

Sample ID	Sample Name	Matrix	Sample Point	Sample Date
20-PPE-00109-1	202000728-01-04-0800	Medical Mask		19-Aug-2020

Parameter / Analyte	Result	Units	Uncert.	DL	Spec. Limt	Analyzed On dd-mmm-yy	Method
PFE #001	99.3	%				24-Aug-20	ASTM F2299
	Face Velocity = 5 cm/s						
PFE #002	99.46	%				24-Aug-20	ASTM F2299
PFE #003	99.44	%				24-Aug-20	ASTM F2299
PFE #004	99.42	%				24-Aug-20	ASTM F2299
PFE #005	99.44	%				24-Aug-20	ASTM F2299
PFE #006	99.35	%				24-Aug-20	ASTM F2299
	PFE for this mask performed at 6.5 cm/s’						

Instruments Used

Name	Serial Number	Last Calibration	Calibration Due
TSI 4045H Mass Flow Meter #10	KIN-04806	07-Jan-2020	07-Jan-2021
TSI 4045 Mass Flow Meter #9	KIN-04557	07-Jan-2020	07-Jan-2021
MET ONE 3411 Particle Counter	2006524001	12-Jun-2020	12-Jun-2021

The Analytical and Environmental Services Laboratory of Kinectrics is accredited by the Standards Council of Canada as conforming with ISO 17025.

The DL is the reported detection limit. All analytical data is subject to uncertainty, and is a function of the sample matrix, method and instrumental variations. As a general guideline, it can be expressed as +/-50% of the result at the detection limit (RDL) and approximately +/-10% of the result at greater than 10 times the RDL. Results in this report relate only to the items/samples tested and to all the items tested, as received. All tests are as defined by our understanding of customer requirements.

TECHNIQUE ‘*’ = ISO 17025 accredited
TECHNIQUE ‘¤’ = Indicates a modified test method
TECHNIQUE ‘†’ = Indicates a sub-contracted analysis

All deliverables are provided as per our standard terms which can be found at the Terms of Business at:
http://www.kinectrics.com/SiteCollectionDocuments/KinectricsStandardTCs.pdf