



Laboratory Report

Prepared For

Med-Con Pty Ltd

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PROJECT Medical Face Mask – Performance Tests

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BACKGROUND

BELL Laboratories was requested to test medical face masks to determine their compliance with performance criteria described in the test methods listed below.

SAMPLE DETAILS

Sample ID	Batch No.	Test Parameters	Test Outcome
EEXI Technology & Service Level 1 childrens face mask 9823KML1	20210810	Particle filtration efficiency Fluid / blood resistance Differential pressure (ΔP)	Pass Pass Pass

TEST METHODS

The following tests were performed in accordance with the equipment, materials, procedures and other requirements of the stated methods except where indicated.

Parameter	Test Methods	Test Level
Particle filtration efficiency (PFE) ¹ / BFE _{sim}	AS 4381:2015 / ASTM F2299-17	Level 1
Fluid / blood resistance	AS 4381:2015 / ISO 22609-2004	Level 1
Differential pressure (breathability)	AS 4381:2015 / EN 14683-2019	Level 1

An in-house test method using polydisperse aerosol based on ASTM F2299 is used to determine particle filtration efficiency (PFE). Simulated Bacterial Filtration Efficiency (BFE_{sim}) is derived from PFE data and is comparable to bacterial filtration efficiency (BFE).

SAMPLE PHOTOGRAPH



TABULATED RESULTS

PARTICLE FILTRATION EFFICIENCY

Manufacturer	EEXI Technology & Service			Sample No.	2110131-1	
Product	Children's Face Mask			Test date	13/10/21	
Model / Batch No.	9823KML1, 20210810			Test methods	AS 4381:2015	ASTM F2299
Mask / Filter type	Level 1			Test outcome	Pass	
Particle Filtration Efficiency	Units	Test 1	Test 2	Test 3	Test 4	Test 5
0.3 µm	%	85.7	88.2	88.8	85.6	84.3
0.5 µm	%	93.8	95.2	95.4	95.1	92.8
1 µm	%	99.4	99.1	99.7	98.8	99.1
3 µm	%	100.0	100.0	100.0	100.0	100.0
5 µm	%	100.0	100.0	100.0	100.0	100.0
10 µm	%	100.0	100.0	100.0	100.0	100.0
BFE-sim	%	99.8	99.7	99.9	99.6	99.7
Particle Filtration Efficiency	Units	Test 6	Test 7	Test 8	Test 9	Test 10
0.3 µm	%	80.5	80.4	85.5	86.2	89.0
0.5 µm	%	89.9	90.9	93.4	94.8	95.3
1 µm	%	98.0	98.8	99.2	99.4	99.6
3 µm	%	99.9	99.7	99.7	100.0	100.0
5 µm	%	100.0	100.0	100.0	100.0	100.0
10 µm	%	100.0	100.0	100.0	100.0	100.0
BFE-sim	%	99.3	99.5	99.6	99.8	99.9
Particle Filtration Efficiency	Units	Test 11	Test 12	Test 13	Average	Performance Criteria
0.3 µm	%	88.0	84.2	85.7	85.5	-
0.5 µm	%	95.4	92.9	95.1	93.8	-
1 µm	%	99.2	99.2	98.6	99.1	-
3 µm	%	100.0	100.0	100.0	100.0	≥95
5 µm	%	100.0	100.0	100.0	100.0	-
10 µm	%	100.0	100.0	100.0	100.0	-
BFE-sim	%	99.7	99.7	99.5	99.7	≥95

Test Conditions

- a) Specimen size: 160 mm x 160 mm (100 mm x 100 mm minimum)
- b) Sample area tested: 100 cm²
- c) Sample air flow rate: 85 L/min
- d) Specimen side facing aerosol: inside
- e) Environmental conditions: 21°C (21±5°C), 85%RH (85±5%RH), ≥24 hours

DIFFERENTIAL PRESSURE

Manufacturer	EEXI Technology & Service		Sample No.	2110131-1		
Product	Children's Face Mask		Test date	13/10/21		
Model / Batch No.	9823KML1, 20210810		Test methods	AS 4381:2015	EN 14683:2019	
Mask / Filter type	Level 1		Test outcome	Pass		
Test	Units	Test 1	Test 2	Test 3	Test 4	Test 5
Δ Pressure	mmH2O/cm ²	3.0	2.8	2.9	3.1	2.9
Test	Units	Test 6	Test 7	Test 8	Test 9	Test 10
Δ Pressure	mmH2O/cm ²	2.8	2.9	3.0	2.9	3.2
Test	Units	Test 11	Test 12	Test 13	Average	Performance Criteria
Δ Pressure	mmH2O/cm ²	2.9	2.7	2.8	2.9	<4.0

Test Conditions

- a) Specimen size: 160 mm x 160 mm
- b) Sample area tested: 4.9 cm²
- c) Sample air flow rate: 8 L/min
- d) Specimen areas tested: 4 x quadrants, 1 x centre
- e) Environmental conditions: 21°C (21±5°C), 85%RH (85±5%RH), ≥4 hours

FLUID RESISTANCE

Manufacturer	EEXI Technology & Service		Sample No.	2110131-1	
Product	Children's Face Mask		Test date	13/10/21	
Model / Batch No.	9823KML1, 20210810		Test methods	AS 4381:2015	ISO 22609:2004
Mask / Filter type	Level 1		Test outcome	Pass	
Test No.	Target	Fluid / Blood resistance			
Test 1 - 4	Mask body	Pass	Pass	Pass	Pass
Test 5 - 8	Mask body	Pass	Pass	Pass	Pass
Test 9 - 12	Mask body	Pass	Pass	Pass	Pass
Test 13 - 16	Mask body	Pass	Pass	Pass	Pass
Test 17 - 20	Mask body	Pass	Pass	Pass	Pass
Test 21 - 24	Mask body	Pass	Pass	Pass	Pass
Test 25 - 28	Mask body	Pass	Pass	Pass	Pass
Test 29 - 32	Mask body	Pass	Pass	Pass	Pass
Test pressure	≥80 mmHg	Pass	32	Fail	0

Test Conditions

- a) Sample size: diameter, 5.6 cm; area, 24.5 cm²
- b) Distance from cannula to mask: 30 cm
- c) Specimen side facing fluid: outside
- d) Environmental conditions: 21°C (21±5°C), 85%RH (85±5%RH), ≥4 hours
- e) Test conditions: 21°C (21±5°C), 85%RH (85±10%RH)
- f) Pre-treatment methods: Not used
- g) Targeting plate method: Not used
- h) Other techniques: Hydrophilic cotton penetration detection aid

QUALITY ASSURANCE

BELL Laboratories operates to ISO 17025 – General Requirements for the Competence of Testing and Calibration Laboratories. ISO 17025 requires that laboratories have an ISO 9002 compliant quality system, suitable equipment and instrumentation, as well as personnel with the training and technical competence to perform the analytical/test procedures.

STATEMENT OF LIMITATIONS

This report has been prepared in accordance with the agreement between BELL Laboratories Pty Ltd and the client. Within the limitations of the agreed scope of services, this work has been performed in a professional manner, in accordance with generally accepted practices, using a degree of skill and care ordinarily exercised by members of its profession and consulting practice. No other warranty, expressed or implied, is made.

Any reliance on this report by a third party shall be at such party's sole risk. The report may not contain sufficient information for the purposes of a third party or for other uses.

This report shall only be presented in full and may not be used to support any other objective than those set out in the report, except where written approval with comments are provided by BELL Laboratories Pty Ltd.

DEFINITIONS

The following symbols and abbreviations may be used in this test report:

<	Less than
>	Greater than
RH	Relative humidity
CO	Carbon monoxide
CO ₂	Carbon dioxide
BP	Barometric pressure
BFE	Bacterial Filtration Efficiency
PFE	Particle Filtration Efficiency
kPa	Kilopascals
Pa	Pascals
µg/m ³	Micrograms per cubic metre
mg/m ³	Milligrams per cubic metre
ppb	Parts per billion
ppm	Parts per million
µm	Micrometer