

Test Report 3201462.


Trust Loyalty & Glory Epoch
Network Technology Co., Ltd.

Introduction.

This report has been prepared by Paul Waller and relates to the activity detailed below:

Job/Registration Details	Client Details
Job number: 3201462 Job type: Testing Samples Submitted Start Date: 24/06/2020 Test type: Type Sample ID: 10189482 Registration: CE 728096 Scheme: Negative pressure RPE Protocol: PP123 Scheme Manager: Nathan Shipley	Trust Loyalty & Glory Epoch Network Technology Co., Ltd. No. 39 Jiangpu Road Suzhou Industrial Park Suzhou City Jiangsu China

The report has been approved for issue by T Wicksey – Senior Test Engineer

Approved For Issue	
	Issue Date: 26 August 2020

Objectives.

This is an independent Type Test evaluation to BS EN 149:2001 + A1:2009

Product Scope.

Filtering half mask, respiratory protective device, to protect against particles.

Report Summary.

The samples were received on 4 June 2020 and the testing was started on 24 June 2020.

The samples submitted complied with the requirements of the test work conducted.

Test Samples.

Sample ID	ER Number	Description
1 to 46	10189482	Model: M-9520A Disposable personal protective mask, Respirator (Fold-Type) FFP2

Description of Test Samples.

Sample Description
Model: M-9520A Disposable personal protective mask, Respirator (Fold-Type) FFP2

Test Requirements.

BS EN 149:2001 + A1:2009 Respiratory protective devices - Filtering half masks to protect against particles.

CLAUSE	REQUIREMENTS	ASSESSMENT
7	Requirements	
7.1	General	-
7.2	Nominal values and tolerances	-
7.3	Visual Inspection	Pass (1)
7.4	Packaging	N/T (2)
7.5	Material	Pass
7.6	Cleaning and disinfecting	N/A (3)
7.7	Practical performance	Pass
7.8	Finish of parts	Pass
7.9	Leakage	-
7.9.1	Total inward leakage	Pass
7.9.2	Penetration of filter material	Pass
7.10	Compatibility with skin	Pass
7.11	Flammability	Pass
7.12	Carbon dioxide content of inhalation air	Pass
7.13	Head harness	Pass
7.14	Field of vision	Pass
7.15	Exhalation valves	N/A (4)
7.16	Breathing resistance	Pass
7.18	Demountable parts	N/A (4)
9	Marking	N/T (1)
10	Information to be supplied by the manufacturer	N/T (1)
Appendix A - Test Panel Data		
Product photographs		

- (1) Marking and user information not assessed, as requested by BSI Product Certification
- (2) Packaging not assessed, as requested by BSI Product Certification
- (3) Single use mask
- (4) Not a design feature of this product

Glossary of Terms.

Pass: Complies. Tested by BSI engineers at BSI laboratories

Pass 1: Complies. Witnessed by BSI engineers in manufacturers laboratory.

Pass 2: Complies. Tests carried out by third party lab; results accepted by BSI.

Pass*: Report resulted in uncertainty and states that Compliance is more probable than non-compliance.

Fail: Non-compliance. Product does not meet the requirements of this clause.

Fail*: Report resulted in uncertainty and states that Non-compliance is more probable than compliance.

N/T: Not Tested

N/A: Not Applicable

AR: As Received

TC: Temperature Conditioned

SW: Simulated Wear

FT: Flow Tested

MS: Mechanical strength

MMDF: Manufactures Minimum Design Flow

MMDC: Manufactures Minimum Design Condition

Conditions of Issue.

This Test Report is issued subject to the conditions stated in current issue of 'BSI Terms of Service'. The results contained herein apply only to the particular sample(s) tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of BSI, who reserve the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.

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Opinions and Interpretations expressed herein are outside the scope of our UKAS accreditation.

Unless otherwise stated, any results not obtained from testing in a BSI laboratory are outside the scope of our UKAS accreditation.

Test Results.

CLAUSE	REQUIREMENTS	ASSESSMENT
7.1	<p>General</p> <p>In all tests all samples shall meet the requirements.</p>	-
7.2	<p>Nominal values and tolerances</p> <p>Unless otherwise specified, the values stated in this European Standard are expressed as nominal values. Except for temperature limits, values, which are not stated as maxima or minima, shall be subject to a tolerance of $\pm 5\%$. Unless otherwise specified, the ambient temperature for testing shall be (16 – 32) °C, and the temperature limits shall be subject to an accuracy of $\pm 1^\circ\text{C}$.</p>	-
7.3	<p>Visual Inspection</p> <p>The visual inspection shall also include the marking and the information supplied by the manufacturer.</p>	Pass (1)
7.4	<p>Packaging</p> <p>Particle filtering half masks shall be offered for sale packaged in such a way that they are protected against mechanical damage and contamination before use.</p> <p>Testing shall be done in accordance with 8.2.</p>	N/T (2)
7.5	<p>Material</p> <p>Materials used shall be suitable to withstand handling and wear over the period for which the particle filtering half mask is designed to be used.</p> <p>After undergoing the conditioning described in 8.3.1 none of the particle filtering half masks shall have suffered mechanical failure of the facepiece or straps.</p> <p>Three particle filtering half masks shall be tested.</p> <p>When conditioned in accordance with 8.3.1 and 8.3.2 the particle filtering half mask shall not collapse.</p> <p>Any material from the filter media released by the air flow through the filter shall not constitute a hazard or nuisance for the wearer.</p> <p>Testing shall be done in accordance with 8.2.</p>	Pass
7.6	<p>Cleaning and disinfecting</p> <p>If the particle filtering half mask is designed to be re-usable, the materials used shall withstand the cleaning and disinfecting agents and procedures specified by the manufacturer.</p> <p>Testing shall be done in accordance with 8.4 and 8.5.</p> <p>With reference to 7.9.2, after cleaning and disinfecting the re-usable particle filtering half mask shall satisfy the penetration requirement of the relevant class.</p> <p>Testing shall be done in accordance with 8.11.</p>	N/A (3)

(1) Marking and user information not assessed, as requested by BSI Product Certification

(2) Packaging not assessed, as requested by BSI Product Certification

(3) Single use mask

Test Results (Continued).

CLAUSE	REQUIREMENTS	ASSESSMENT
7.7	<p>Practical performance</p> <p>The particle filtering half mask shall undergo practical performance tests under realistic conditions. These general tests serve the purpose of checking the equipment for imperfections that cannot be determined by the tests described elsewhere in this standard. Where practical performance tests show the apparatus has imperfections related to wearer's acceptance, the test house shall provide full details of those parts of the practical performance tests which revealed these imperfections.</p> <p>Testing shall be done in accordance with 8.4.</p>	<p>Pass</p> <p>User ID: AA1 and JS3</p> <p>See Appendix A</p>
7.8	<p>Finish of parts</p> <p>Parts of the device likely to come into contact with the wearer shall have no sharp edges or burrs.</p> <p>Testing shall be done in accordance with 8.2.</p>	<p>Pass</p>

Test Results (Continued).

CLAUSE	REQUIREMENTS	ASSESSMENT
7.9	Leakage	
7.9.1	<p>Total inward leakage</p> <p>The laboratory tests shall indicate that the particle filtering half mask can be used by the wearer to protect with high probability against the potential hazard to be expected. The total inward leakage consists of three components: face seal leakage, exhalation valve leakage (if exhalation valve fitted) and filter penetration.</p> <p>For particle filtering half masks fitted in accordance with the manufacturer's information, at least 46 out of the 50 individual exercise results (i.e. 10 subjects x 5 exercises) for total inward leakage shall be not greater than</p> <p style="padding-left: 40px;">25% for FFP1 11% for FFP2 5% for FFP3</p> <p>and, in addition, at least 8 out of the 10 individual wearer arithmetic means for the total inward leakage shall be not greater than</p> <p style="padding-left: 40px;">22% for FFP1 8% for FFP2 2% for FFP3</p> <p>Testing shall be done in accordance with 8.5.</p>	<p>Pass See Table A and Appendix A</p>

Table A: Total Inward Leakage Results

Test Panel Member	Pre-test condition	Sample No	A	B	C	D	E	Average (%)
			Walking (%)	Walking with head side to side (%)	Walking with head up & down (%)	Walking and talking (%)	Walking (%)	
AH1	AR	3	3.274	3.848	3.258	4.059	3.256	3.539
LM1	AR	4	0.339	0.317	0.792	0.173	0.107	0.346
BH1	AR	5	0.093	0.190	1.264	0.109	0.301	0.391
JS2	AR	6	0.032	0.072	0.042	0.030	0.032	0.042
JW1	AR	7	0.065	0.057	0.124	0.059	0.177	0.096
LM2	TC	8	0.184	0.270	3.174	0.141	0.218	0.797
JB1	TC	9	2.635	2.633	2.636	2.643	0.246	2.158
CB1	TC	10	3.786	3.786	3.785	3.792	3.791	3.788
JA1	TC	11	3.614	2.981	2.987	2.928	2.904	3.083
SI1	TC	12	3.722	3.736	3.722	3.777	3.729	3.737

Test Results (Continued).

CLAUSE	REQUIREMENTS	ASSESSMENT
7.9.2	<p>Penetration of filter material</p> <p>The penetration of the filter of the particle filtering half mask shall meet the requirements of Table 1 of the standard.</p> <p>A total of 9 samples of particle filtering half masks shall be tested for each aerosol. Testing in accordance with clause 8.11 of the standard using the Penetration test according to EN 13274-7, shall be performed on:</p> <ul style="list-style-type: none"> 3 samples as received, 3 samples after the simulated wearing treatment described in 8.3.1. <p>Testing in accordance with 8.11 using the Exposure test with a specified mass of test aerosol of 120 mg, and for particle filtering devices claimed to be re-usable additionally the Storage test, according to EN 13274-7, shall be performed:</p> <ul style="list-style-type: none"> for non-re-usable devices on: <ul style="list-style-type: none"> 3 samples after the test for mechanical strength in accordance with 8.3.3 followed by temperature conditioning in accordance with 8.3.2. for re-usable devices on: <ul style="list-style-type: none"> 3 samples after the test for mechanical strength in accordance with 8.3.3 followed by temperature conditioning in accordance with 8.3.2 and followed by one cleaning and disinfecting cycle according to the manufacturer's instruction. 	<p>Pass See Table B</p> <p>Pass See Table C</p> <p>N/A (1)</p>

Table B: Maximum sodium chloride penetration @ 95 l/min

Sample No	Pre-test condition	Flow through filter (l/min)	Max Specified Penetration (%)	Actual Penetration (%)
13	AR	95	6.0	0.102
14	AR	95	6.0	0.113
15	AR	95	6.0	0.191
16	SW	95	6.0	0.121
17	SW	95	6.0	0.144
18	SW	95	6.0	0.141

(1) Not a design feature of this product

Test Results (Continued).

CLAUSE	REQUIREMENTS
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7.9.2 Penetration of filter material (continued)

Table C: Maximum sodium chloride penetration

	Sample 25	Sample 26	Sample 27
Pre-test condition	Mechanical strength and Temperature Conditioning		
Flow through filter	95 l/min		
Elapsed Time in Minutes	Actual Penetration % (Maximum permitted penetration 6.0%)		
5	0.123	0.119 (1)	0.153 (1)
10	0.124 (1)	0.114	0.152
15	0.1167	0.105	0.149
20	0.104	0.095	0.137
25	0.092	0.081	0.124
30	0.074	0.067	0.112
35	0.061		
Result	Pass	Pass	Pass

After the Actual Penetration readings shown with suffix (1), the reading at 5 subsequent sampling intervals showed a decline and the testing was terminated without the 120mg exposure limit being reached, as permitted by BS EN 13274-7: 2008.

Test Results (Continued).

CLAUSE	REQUIREMENTS	ASSESSMENT
7.9.2	<p>Penetration of filter material (continued)</p> <p>The penetration of the filter of the particle filtering half mask shall meet the requirements of Table 1 of the standard.</p> <p>A total of 9 samples of particle filtering half masks shall be tested for each aerosol. Testing in accordance with 8.11 using the Penetration test according to EN 13274-7, shall be performed on:</p> <ul style="list-style-type: none"> 3 samples as received, 3 samples after the simulated wearing treatment described in 8.3.1. <p>Testing in accordance with 8.11 using the exposure test with a specified mass of test aerosol of 120 mg, and for particle filtering devices claimed to be re-usable additionally the Storage test, according to EN 13274-7, shall be performed:</p> <ul style="list-style-type: none"> for non-re-usable devices on: <ul style="list-style-type: none"> 3 samples after the test for mechanical strength in accordance with 8.3.3 followed by temperature conditioning in accordance with 8.3.2. for re-usable devices on: <ul style="list-style-type: none"> 3 samples after the test for mechanical strength in accordance with 8.3.3 followed by temperature conditioning in accordance with 8.3.2 and followed by one cleaning and disinfecting cycle according to the manufacturer's instruction. 	<p>Pass See Table D</p> <p>Pass See Table E</p> <p>N/A (1)</p>

Table D: Maximum Paraffin oil penetration @ 95 l/min

Sample No	Pre-test condition	Flow through filter (l/min)	Max Specified Penetration (%)	Actual Penetration (%)
19	AR	95	6.0	0.316
20	AR	95	6.0	0.272
21	AR	95	6.0	0.279
22	SW	95	6.0	0.489
23	SW	95	6.0	0.480
24	SW	95	6.0	0.416

(1) Not a design feature of this product

Test Results (Continued).

CLAUSE	REQUIREMENTS
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7.9.2 Penetration of filter material (continued)

Table E: Maximum paraffin oil penetration

	Sample 28	Sample 29	Sample 30
Pre-test condition	Mechanical strength and Temperature Conditioning		
Challenge concentration (mg/m ³)	20	20	20
Flow through filter	95 l/min		
Elapsed Time in Minutes	Actual Penetration % (Maximum permitted penetration 6.0%)		
3	0.866	0.693	0.778
5	0.858	0.665	0.776
10	0.936	0.755	0.913
15	1.019	0.798	0.979
20	1.044	0.832	1.040
25	1.123	0.862	1.141
30	1.138	0.900	1.152
35	1.202	0.937	1.121
40	1.247	0.970	1.255
45	1.307	1.006	1.298
50	1.377	1.032	1.237
55	1.386	1.051	1.334
60	1.428	1.068	1.393
(1)	1.407	1.071	1.407
Result	Pass	Pass	Pass

(1) A loading of 120 mg was achieved after a period of 63 minutes, 10 seconds had elapsed.

Test Results (Continued).

CLAUSE	REQUIREMENTS	ASSESSMENT																
7.10	<p>Compatibility with skin</p> <p>Materials that may come into contact with the wearer's skin shall not be known to be likely to cause irritation or any other adverse effect to health.</p> <p>Testing shall be done in accordance with 8.4 and 8.5.</p>	<p>Pass</p> <p>User ID: AA1 and JS3</p> <p>See Appendix A</p>																
7.11	<p>Flammability</p> <p>The material used shall not present a danger for the wearer and shall not be of a highly flammable nature.</p> <p>When tested, the particle filtering half mask shall not burn or not continue to burn for more than 5 seconds after removal from the flame.</p> <p>The particle filtering half mask does not have to be usable after the test.</p> <p>Testing shall be done in accordance with 8.6.</p>	<p>Pass</p>																
7.12	<p>Carbon dioxide content of inhalation air</p> <p>The carbon dioxide content of the inhalation air (dead space) shall not exceed an average of 1.0% (by volume).</p> <p>Testing shall be done in accordance with 8.7.</p> <p>Table F: Carbon dioxide content of the inhalation air</p> <table border="1"> <thead> <tr> <th>Sample No</th> <th>Pre-test condition</th> <th>Maximum Specified CO₂ (%)</th> <th>Actual CO₂ (%)</th> </tr> </thead> <tbody> <tr> <td>38</td> <td>AR</td> <td>1.0</td> <td>0.60</td> </tr> <tr> <td>39</td> <td>AR</td> <td>1.0</td> <td>0.50</td> </tr> <tr> <td>40</td> <td>AR</td> <td>1.0</td> <td>0.50</td> </tr> </tbody> </table>	Sample No	Pre-test condition	Maximum Specified CO ₂ (%)	Actual CO ₂ (%)	38	AR	1.0	0.60	39	AR	1.0	0.50	40	AR	1.0	0.50	<p>Pass</p> <p>See Table F</p>
Sample No	Pre-test condition	Maximum Specified CO ₂ (%)	Actual CO ₂ (%)															
38	AR	1.0	0.60															
39	AR	1.0	0.50															
40	AR	1.0	0.50															
7.13	<p>Head harness</p> <p>The head harness shall be designed so that the particle filtering half mask can be donned and removed easily.</p> <p>The head harness shall be adjustable or self-adjusting and shall be sufficiently robust to hold the particle filtering half mask firmly in position and be capable of maintaining total inward leakage requirements for the device.</p> <p>Testing shall be done in accordance with 8.4 and 8.5.</p>	<p>Pass</p> <p>User ID: AA1 and JS3</p> <p>See Appendix A</p>																
7.14	<p>Field of vision</p> <p>The field of vision is acceptable if determined so in practical performance tests.</p> <p>Testing shall be done in accordance with 8.4.</p>	<p>Pass</p> <p>User ID: AA1 and JS3</p> <p>See Appendix A</p>																

Test Results (Continued).

CLAUSE	REQUIREMENTS	ASSESSMENT
7.16	<p>Breathing resistance</p> <p>The breathing resistances apply to valved and valveless particle filtering half masks and shall meet the requirements of Table 2.</p> <p>A total of 9 valveless particle filtering half masks shall be tested: 3 as received, 3 after temperature conditioning in accordance with 8.3.2 and 3 after the test for simulated wearing in accordance with 8.3.1.</p> <p>Testing shall be done in accordance with 8.9.</p> <p>A total of 12 valved particle filtering half masks shall be tested: 3 as received, 3 after temperature conditioning in accordance with 8.3.2, 3 after the test for simulated wearing in accordance with 8.3.1 and 3 after the flow conditioning in accordance with 8.3.4.</p> <p>Testing shall be done in accordance with 8.9.</p>	<p>Pass See Tables G, H and I</p> <p>N/A (1)</p>

Table G: Inhalation resistance @ 30 l/min

Sample No	Pre-test condition	Continuous flow (l/min)	Max spec inhalation resistance (mbar)	Actual inhalation resistance (mbar)
13	AR	30	0.7	0.40
14	AR	30	0.7	0.41
15	AR	30	0.7	0.42
16	SW	30	0.7	0.41
17	SW	30	0.7	0.42
18	SW	30	0.7	0.43
31	TC	30	0.7	0.42
32	TC	30	0.7	0.40
33	TC	30	0.7	0.41

(1) Not a design feature of this product

Test Results (Continued).

CLAUSE	REQUIREMENTS
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7.16

Breathing resistance (continued)

Table H: Inhalation resistance @ 95 l/min

Sample No	Pre-test condition	Continuous flow (l/min)	Max spec inhalation resistance (mbar)	Actual inhalation resistance (mbar)
13	AR	95	2.4	1.22
14	AR	95	2.4	1.21
15	AR	95	2.4	1.21
16	SW	95	2.4	1.46
17	SW	95	2.4	1.41
18	SW	95	2.4	1.44
31	TC	95	2.4	1.36
32	TC	95	2.4	1.31
33	TC	95	2.4	1.35

Table I: Exhalation resistance @ 160 l/min

measured in five orientations - worst case recorded.

Sample No	Pre-test condition	Continuous flow (l/min)	Max spec exhalation resistance (mbar)	Actual exhalation resistance (mbar)
13	AR	160	3.0	1.80
14	AR	160	3.0	1.81
15	AR	160	3.0	1.78
16	SW	160	3.0	2.07
17	SW	160	3.0	2.11
18	SW	160	3.0	2.16
31	TC	160	3.0	2.12
32	TC	160	3.0	2.10
33	TC	160	3.0	2.06

Appendix A – Test Panel Data.

Test Candidate	Facial Dimensions (mm)					Gender
	Length of face	Width of face	Face depth	Width of mouth	Head Circumference	
AH1	108	124	130	46	570	Male
LM1	111	138	96	54	545	Female
BH1	120	126	120	58	565	Male
JS2	126	142	125	57	575	Male
JW1	116	126	122	48	570	Male
LM2	110	148	125	44	589	Male
JB1	114	144	108	59	574	Male
CB1	117	147	130	57	566	Male
JA1	117	134	129	49	565	Male
SI1	121	135	142	48	575	Male
AA1	125	144	130	47	581	Male
JS3	126	134	124	49	600	Male

Note: All candidates were clean shaven

Product photographs.



Front view



Side view



Inside view

*** End of Report ***