



Test Report



Report No	255/7297330/2 of 4	This Report consists of 9 pages
Licence/Certificate No	CE 79995	
Client	Handan Hengyong Protective & Clean Products Co Ltd 1-1-1201, 455 Gongnong Road, Shijiazhuang, Hebei CN 050051	
Authority & date	BSI Product Services: Service Management Order No 7297330 dated 2 October 2008 Equipment Record No 10100995	
Items tested	HY8910 FFP1 Horizontal Fold-flat Disposable Mask – (Non valve) Thirty (30) samples submitted	
Specification	Article 11A Audit test to BS EN 149:2001 + A1: 2009 Respiratory protective devices – Filtering half masks to protect against particles– Incorporating Corrigendum July 2002. See Assessment Summary	
Results	See Assessment Summary	
Prepared by	M K Thompson	 Technical Engineer
Authorized by	M Mayo	 Laboratory Manager
Issue Date	29 October 2009	
Conditions of issue	This Test Report is issued subject to the conditions stated in current issue of CP0322 'Conditions of Contract for Testing'. 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 the Managing Director, BSI Testing Services, who reserves 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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BS EN 149:2001 + A1: 2009

SPECIFICATION: Article 11A Audit testing to BS EN 149:2001 Respiratory protective devices - Filtering half masks to protect against particles
Incorporating Corrigendum No 1 (See Assessment Summary for details)

CLIENT/MANUFACTURER: Handan Hengyong Protective & Clean Products Co Ltd

MODEL: HY8910 FFP1 Horizontal Fold-flat Disposable Mask – (Non valve)

BUILD STANDARD: As per Certified Product

NUMBER OF SAMPLES: 30

ER NO: 10100995

DATE RECEIVED: 23 September 2009

DATE STARTED: 12 October 2009

FILTER CLASSIFICATION: FFP1

INTRODUCTION

The samples detailed above were submitted by the Client for an Article 11A audit assessment.

The samples were assessed against Clause 7.9.2 'Penetration of filter material' and Clause 7.16 'Breathing Resistance' only at the request of BSI Product Certification.

This Report describes the Article 11A Audit assessment for Model HY9610. Reports 255/7297330/1 of 4, 255/7297330/3 of 4 and 255/7297330/4 of 4 describe the assessments of Models HY9610, HY9622 and HY8922 respectively.

This Report should be read in conjunction with the Specification referenced above.

ASSESSMENT SUMMARY

An Assessment Summary is presented on page 3.

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ASSESSMENT SUMMARY

CLAUSE NO AND TITLE		ASSESSMENT	LOCATION
7	REQUIREMENTS		
7.1	General	-	Page 4
7.2	Nominal values and tolerances	-	Page 4
7.3	Visual inspection	N/As (1)	-
7.4	Packaging	N/As (1)	-
7.5	Material	N/As (1)	-
7.6	Cleaning and disinfecting	N/As (1)	-
7.7	Practical performance	N/As (1)	-
7.8	Finish of parts	N/As (1)	-
7.9	Leakage	-	-
7.9.1	Total inward leakage	N/As (1)	-
7.9.2	Penetration of filter material	Pass	Pages 4-7
7.10	Compatibility with skin	N/As (1)	-
7.11	Flammability	N/As (1)	-
7.12	Carbon dioxide content of inhalation air	N/As (1)	-
7.13	Head harness	N/As (1)	-
7.14	Field of vision	N/As (1)	-
7.15	Exhalation valve(s)	N/As (1)	-
7.16	Breathing resistance	Pass	Pages 8-9
7.17	Clogging	N/As (1)	-
7.18	Demountable parts	N/As (1)	-
9	Marking	N/As (1)	-
10	Information to be supplied by the manufacturer	N/As (1)	-

N/As: Not Assessed

(1) Not required by BSI Product Certification.

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EXAMINATION AND TEST

Model Type:- HY8910 FFP1 Horizontal Fold-flat Disposable Mask – (Non valve)

CLAUSE	REQUIREMENT	ASSESSMENT																																			
7	REQUIREMENTS																																				
7.1	General In all tests all samples shall meet the requirements.	-																																			
7.2	Nominal values and tolerances 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 ±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 ± 1°C.	-																																			
7.9 7.9.2	Leakage Penetration of filter material The penetration of the filter of the particle filtering half mask shall meet the requirements of Table 1 of the standard. 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: <ul style="list-style-type: none">- 3 samples as received,- 3 samples after the simulated wearing treatment described in clause 8.3.1 of the standard. Testing in accordance with Clause 8.11 of the standard 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: <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 clause 8.3.3 of the standard followed by temperature conditioning in accordance with clause 8.3.2 of the standard. Table A. Maximum sodium chloride penetration @ 95 l/min <table><tr><th>Sample No</th><th>Pre-test condition</th><th>Flow through filter (l/min)</th><th>Max Specified Penetration (%)</th><th>Actual Penetration (%)</th></tr><tr><td>1</td><td>AR</td><td>95</td><td>20</td><td>0.5316</td></tr><tr><td>2</td><td>AR</td><td>95</td><td>20</td><td>0.6066</td></tr><tr><td>3</td><td>AR</td><td>95</td><td>20</td><td>0.8566</td></tr><tr><td>7</td><td>SW</td><td>95</td><td>20</td><td>0.8587</td></tr><tr><td>8</td><td>SW</td><td>95</td><td>20</td><td>0.1745</td></tr><tr><td>9</td><td>SW</td><td>95</td><td>20</td><td>0.5260</td></tr></table>	Sample No	Pre-test condition	Flow through filter (l/min)	Max Specified Penetration (%)	Actual Penetration (%)	1	AR	95	20	0.5316	2	AR	95	20	0.6066	3	AR	95	20	0.8566	7	SW	95	20	0.8587	8	SW	95	20	0.1745	9	SW	95	20	0.5260	Pass See Table A
Sample No	Pre-test condition	Flow through filter (l/min)	Max Specified Penetration (%)	Actual Penetration (%)																																	
1	AR	95	20	0.5316																																	
2	AR	95	20	0.6066																																	
3	AR	95	20	0.8566																																	
7	SW	95	20	0.8587																																	
8	SW	95	20	0.1745																																	
9	SW	95	20	0.5260																																	

AR: As Received

SW: Simulated Wear

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BS EN 149:2001 + A1: 2009

EXAMINATION AND TEST (CONTINUED)

Model Type:- HY8910 FFP1 Horizontal Fold-flat Disposable Mask – (Non valve)

Table B. Maximum sodium chloride penetration

	Sample 10	Sample 11	Sample 12
Pre-test condition	Mechanical strength and Temperature Conditioning		
Flow through filter	95 l/min		
Elapsed Time in Minutes	Actual Penetration % (Maximum permitted penetration 20.0%)		
5	0.8488	0.7640	0.7211
10	0.8667 (1)	0.8159	0.8129
15	0.8442	1.0909 (1)	0.8617
20	0.7877	1.0100	0.8943
25	0.6740	0.9716	0.8962 (1)
30	0.5999	0.8758	0.8748
35	0.5241	0.7832	0.8274
40		0.6713	0.7753
45			0.6652
50			0.5922
55			
60			
65			
70			
75			
80			
85			
90			
95			
100			
105			
110			
Assessment:	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.

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EXAMINATION AND TEST (CONTINUED)

Model Type:- HY8910 FFP1 Horizontal Fold-flat Disposable Mask – (Non valve)

CLAUSE	REQUIREMENT	ASSESSMENT																																			
7.9 7.9.2	<p>Leakage (continued)</p> <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. 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 clause 8.3.1 of the standard. <p>Testing in accordance with Clause 8.11 of the standard 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 clause 8.3.3 of the standard followed by temperature conditioning in accordance with clause 8.3.2 of the standard. <p>Table C. Maximum Paraffin oil penetration @ 95 l/min</p> <table><tr><th>Sample No</th><th>Pre-test condition</th><th>Flow through filter (l/min)</th><th>Max Specified Penetration (%)</th><th>Actual Penetration (%)</th></tr><tr><td>1</td><td>AR</td><td>95</td><td>20.0</td><td>1.45</td></tr><tr><td>2</td><td>AR</td><td>95</td><td>20.0</td><td>2.17</td></tr><tr><td>3</td><td>AR</td><td>95</td><td>20.0</td><td>1.59</td></tr><tr><td>7</td><td>SW</td><td>95</td><td>20.0</td><td>1.08</td></tr><tr><td>8</td><td>SW</td><td>95</td><td>20.0</td><td>0.77</td></tr><tr><td>9</td><td>SW</td><td>95</td><td>20.0</td><td>1.12</td></tr></table>	Sample No	Pre-test condition	Flow through filter (l/min)	Max Specified Penetration (%)	Actual Penetration (%)	1	AR	95	20.0	1.45	2	AR	95	20.0	2.17	3	AR	95	20.0	1.59	7	SW	95	20.0	1.08	8	SW	95	20.0	0.77	9	SW	95	20.0	1.12	<p>Pass See Table C and D</p>
Sample No	Pre-test condition	Flow through filter (l/min)	Max Specified Penetration (%)	Actual Penetration (%)																																	
1	AR	95	20.0	1.45																																	
2	AR	95	20.0	2.17																																	
3	AR	95	20.0	1.59																																	
7	SW	95	20.0	1.08																																	
8	SW	95	20.0	0.77																																	
9	SW	95	20.0	1.12																																	

AR: As Received

SW: Simulated Wear

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EXAMINATION AND TEST (CONTINUED)

Model Type:- HY8910 FFP1 Horizontal Fold-flat Disposable Mask – (Non valve)

Table D. Maximum paraffin oil penetration

	Sample 10	Sample 11	Sample 12
Pre-test condition	Mechanical strength and Temperature Conditioning		
Challenge concentration (mg/m ³)			
Flow through filter	95 l/min		
Elapsed Time in Minutes	Actual Penetration % (Maximum permitted penetration 20.0%)		
3	3.87	2.98	3.09
5	3.91	3.43	3.29
10	4.10	3.87	3.49
15	4.29	4.32	3.70
20	4.81	4.10	4.10
25	5.69	4.54	4.30
30	5.69	4.77	4.70
35	5.69	4.77	4.91
40	5.69	4.94	4.87
45	6.36	5.43	5.06
50	6.36	5.66	5.45
55	5.61	5.66	5.64
60	6.33	5.88	5.83
65	6.55	6.33	6.21
70	6.77	6.55	6.72
75	7.00	6.77	6.43
Assessment:	Pass	Pass	Pass

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

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EXAMINATION AND TEST (CONTINUED)

Model Type:- HY8910 FFP1 Horizontal Fold-flat Disposable Mask – (Non valve)

CLAUSE	REQUIREMENT	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 of the standard.</p> <p>Test in accordance with clause 8.9 of the standard.</p> <p>A total of 9 valveless particle filtering half masks shall be tested: 3 as received, 3 after temperature conditioning in accordance with clause 8.3.2 of the standard and 3 after the test for simulated wearing in accordance with clause 8.3.1 of the standard.</p> <p>Table E : Inhalation resistance @ 30 l/min</p> <table><tr><th>Sample No</th><th>Pre-test condition</th><th>Continuous flow (l/min)</th><th>Max spec inhalation resistance (mbar)</th><th>Actual inhalation resistance (mbar)</th></tr><tr><td>1</td><td>AR</td><td>30</td><td>0.6</td><td>0.27</td></tr><tr><td>2</td><td>AR</td><td>30</td><td>0.6</td><td>0.19</td></tr><tr><td>3</td><td>AR</td><td>30</td><td>0.6</td><td>0.19</td></tr><tr><td>4</td><td>TC</td><td>30</td><td>0.6</td><td>0.22</td></tr><tr><td>5</td><td>TC</td><td>30</td><td>0.6</td><td>0.21</td></tr><tr><td>6</td><td>TC</td><td>30</td><td>0.6</td><td>0.28</td></tr><tr><td>7</td><td>SW</td><td>30</td><td>0.6</td><td>0.27</td></tr><tr><td>8</td><td>SW</td><td>30</td><td>0.6</td><td>0.22</td></tr><tr><td>9</td><td>SW</td><td>30</td><td>0.6</td><td>0.19</td></tr></table>	Sample No	Pre-test condition	Continuous flow (l/min)	Max spec inhalation resistance (mbar)	Actual inhalation resistance (mbar)	1	AR	30	0.6	0.27	2	AR	30	0.6	0.19	3	AR	30	0.6	0.19	4	TC	30	0.6	0.22	5	TC	30	0.6	0.21	6	TC	30	0.6	0.28	7	SW	30	0.6	0.27	8	SW	30	0.6	0.22	9	SW	30	0.6	0.19	<p>Pass (See Tables E, F and G)</p>
Sample No	Pre-test condition	Continuous flow (l/min)	Max spec inhalation resistance (mbar)	Actual inhalation resistance (mbar)																																																
1	AR	30	0.6	0.27																																																
2	AR	30	0.6	0.19																																																
3	AR	30	0.6	0.19																																																
4	TC	30	0.6	0.22																																																
5	TC	30	0.6	0.21																																																
6	TC	30	0.6	0.28																																																
7	SW	30	0.6	0.27																																																
8	SW	30	0.6	0.22																																																
9	SW	30	0.6	0.19																																																

AR: As Received
SW: Simulated Wear

TC: Temperature Conditioned

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EXAMINATION AND TEST (CONTINUED)

Model Type:- HY8910 FFP1 Horizontal Fold-flat Disposable Mask – (Non valve)

CLAUSE	REQUIREMENT					ASSESSMENT
7.16	Breathing resistance (continued)					
	Table F: Inhalation resistance @ 95 l/min					
	Sample No	Pre-test condition	Continuous flow (l/min)	Max spec inhalation resistance (mbar)	Actual inhalation resistance (mbar)	
	1	AR	95	2.1	0.72	Pass
	2	AR	95	2.1	0.63	Pass
	3	AR	95	2.1	0.59	Pass
	4	TC	95	2.1	0.64	Pass
	5	TC	95	2.1	0.68	Pass
	6	TC	95	2.1	0.69	Pass
	7	SW	95	2.1	0.75	Pass
	8	SW	95	2.1	0.76	Pass
	9	SW	95	2.1	0.62	Pass
	Table G: 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)	
	1	AR	160	3.0	1.01	Pass
	2	AR	160	3.0	1.10	Pass
	3	AR	160	3.0	1.11	Pass
	4	TC	160	3.0	1.01	Pass
	5	TC	160	3.0	0.98	Pass
	6	TC	160	3.0	0.97	Pass
	7	SW	160	3.0	1.16	Pass
	8	SW	160	3.0	1.27	Pass
	9	SW	160	3.0	1.00	Pass