Test Report

Product Services

Report No	255/4941766 — This Report consists of 11 pages
Licence/Cert. No	CE 70730
Client	Handan Hengyong Protective and Clean Products Company Limited 300 Gongnong Road Shijiazhuang Hebei Republic of China 050051
Authority & date	BSI Product Service: Service Management Order No 4941766 Dated 11 January 2007. Equipment Record No 10083262
Items tested	Model: Thirty (30) off Handan Hengyong HY9320 FFP1/2 Foldable Masks
Specification	Limited testing to BS EN 149:2001 Respiratory protective devices – Filtering half masks to protect against particles
Results	See Assessment Summary
Prepared by	J Veasey — Test Engineer A Harding — Test Engineer
Authorized by	D Mackie — Senior Engineer
Issue Date	22 January 2007
Conditions of issue	This Test Report is issued subject to the conditions stated in current issue of *PS082* 'General conditions relating to acceptance of 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 Product 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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BSI PRODUCT SERVICES
BS EN 149:2001

SPECIFICATION:- Limited testing to BS EN 149:2001 Respiratory protective devices - Filtering half masks to protect against particles
(see Assessment Summary for details)

CLIENT/MANUFACTURER: Handan Hengyong Protective and Clean Products Company Limited

MODEL: HY9320 FFP1/2 Foldable Masks

NUMBER OF SAMPLES & SIZES: 15 tested of 30 submitted for test

ER NO:10083262

DATE RECEIVED: 11January 2006
DATE STARTED: 11 January 2006

MANUFACTURER'S CLAIMED EQUIPMENT PERFORMANCE:-
Filter classification: FFP1/2

INTRODUCTION

The samples detailed above were submitted by the Client for a limited test programme.

This Report should be read in conjunction with the Specifications referenced above

Unless specified all testing was performed in accordance with EN 149:2001

ASSESSMENT SUMMARY

An Assessment Summary is presented on page 3.

BSI PRODUCT SERVICES
BS EN 149:2001

ASSESSMENT SUMMARY

CLAUSE NO AND TITLE		ASSESSMENT	LOCATION
7	**REQUIREMENTS**		
7.1	**General**	Pass(4)	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**	Pass	Page 5
7.9	**Leakage**		
7.9.1	Total inward leakage	N/As (1)	-
7.9.2	Penetration of filter material	Pass	Pages 6 & 7
7.10	**Compatibility with skin**	N/As (1)	-
7.11	**Flammability**	N/As (1)	-
7.12	**Carbon dioxide content of inhalation air**		Page 8
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 9 to 11
7.17	**Clogging**	N/Ap (3)	-
7.18	**Demountable parts**	N/Ap (2)	-
9	**Marking**	N/As (1)	-
10	**Information to be supplied by the manufacturer**	N/As (1)	-

N/Ap: Not Applicable N/As: Not Assessed

(1) Not required by BSI Product Certification.

(2) Not applicable to this product.

(3) Option not claimed

(4) All requirements requested by Product Certification Passed

BSI PRODUCT SERVICES
BS EN 149:2001

EXAMINATION AND TEST (CONTINUED)

Model Type :- HY9320 FFP1/2 Foldable Masks

CLAUSE	REQUIREMENT	ASSESSMENT
7 7.1	**REQUIREMENTS** **General** In all tests all samples shall meet the requirements.	Pass (2)
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.	-
7.3	**Visual Inspection** The visual inspection shall also include the marking and the information supplied by the manufacturer.	N/As (1)
7.4	**Packaging** 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. Test in accordance with clause 8.2 of the standard.	N/As (1)
7.5	**Material** Materials used are suitable to withstand handling and wear over the period for which the particle filtering half mask is designed to be used.	N/As (1)
	After undergoing the conditioning described in clause 8.3.1 of the standard none of the particle filtering half masks shall have suffered mechanical failure of the facepiece or straps.	N/As (1)
	When conditioned in accordance with clauses 8.3.1 and 8.3.2 the particle filtering half mask shall not collapse.	N/As (1)
	Any material from the filter media released by the air flow through the filter shall not constitute a hazard or nuisance for the wearer. Test in accordance with clause 8.2 of the standard.	N/As (1)

N/Ap: Not Applicable N/As: Not Assessed

(1) Not required by BSI Product Certification.

(2) All requirements requested by Product Certification Passed

BSI PRODUCT SERVICES
BS EN 149:2001

EXAMINATION AND TEST (CONTINUED)

Model Type :- HY9320 FFP1/2 Foldable Masks

CLAUSE	REQUIREMENT	ASSESSMENT
7.6	**Cleaning and disinfecting** If the particle filtering half mask is designed for more than a single shift (i.e. not designed for single use only) the materials used shall withstand the cleaning and disinfecting agents recommended by the manufacturer. Test in accordance with clauses 8.4 and 8.5 of the standard.	N/Ap (2)
7.7	**Practical performance** 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. Test in accordance with clause 8.4 of the standard.	N/As (1)
7.8	**Finish of parts** Parts of the device likely to come into contact with the wearer shall have no sharp edges or burrs. Test in accordance with clause 8.2 of the standard.	Pass

N/Ap: Not Applicable N/As: Not Assessed

(1) Not required by BSI Product Certification.

(2) Not applicable to this product.

BSI PRODUCT SERVICES
BS EN 149:2001
EXAMINATION AND TEST (CONTINUED)

Model Type :- HY9320 FFP1/2 Foldable Masks

CLAUSE	REQUIREMENT	ASSESSMENT
7.9 7.9.2	**Leakage (continued)** Penetration of filter material (Continued next page) The penetration of the filter of the particle filtering half mask shall meet the requirements of Table 1 of the standard. A total of 12 particle filtering half masks shall be tested for each aerosol: 3 as received, 3 after temperature conditioning in accordance with clause 8.3.2, 3 after the simulated wearing treatment described in clause 8.3.1, and 3 after the test for mechanical strength in accordance with clause 8.3.3. Test in accordance with clause 8.11 of the standard.	See Table B

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

Sample No	Pre-test condition	Flow through filter (l/min)	Max Specified Penetration (%)	Actual Penetration (%)	
1	AR	95	6.0	0.6289	Pass
2	AR	95	6.0	0.0949	Pass
3	AR	95	6.0	0.2545	Pass
4	TC	95	6.0	0.3933	Pass
5	TC	95	6.0	0.5713	Pass
6	TC	95	6.0	0.0985	Pass
7	SW	95	6.0	0.0390	Pass
8	SW	95	6.0	0.2666	Pass
9	SW	95	6.0	0.0205	Pass
10	MS	95	6.0	0.3263	Pass
11	MS	95	6.0	0.7162	Pass
12	MS	95	6.0	0.6491	Pass

AR: As Received
SW: Simulated Wear
TC: Temperature Conditioned
MS: Mechanical strength

BSI PRODUCT SERVICES
BS EN 149:2001
EXAMINATION AND TEST (CONTINUED)

Model Type :- HY9320 FFP1/2 Foldable Masks

CLAUSE	REQUIREMENT	ASSESSMENT
7.9 7.9.2	**Leakage (continued)** Penetration of filter material (Continued) The penetration of the filter of the particle filtering half mask shall meet the requirements of Table 1 of the standard. A total of 12 particle filtering half masks shall be tested for each aerosol: 3 as received, 3 after temperature conditioning in accordance with clause 8.3.2, 3 after the simulated wearing treatment described in clause 8.3.1, and 3 after the test for mechanical strength in accordance with clause 8.3.3. Test in accordance with clause 8.11 of the standard.	See Table C

Table C. Maximum paraffin oil penetration @ 95 l/min

Sample No	Pre-test condition	Flow through filter (l/min)	Max Specified Penetration (%)	Actual Penetration (%)	
1	AR	95	6.0	0.25	Pass
2	AR	95	6.0	0.20	Pass
3	AR	95	6.0	0.26	Pass
4	TC	95	6.0	0.60	Pass
5	TC	95	6.0	0.55	Pass
6	TC	95	6.0	0.23	Pass
7	SW	95	6.0	0.15	Pass
8	SW	95	6.0	0.50	Pass
9	SW	95	6.0	0.11	Pass
10	MS	95	6.0	0.40	Pass
11	MS	95	6.0	0.70	Pass
12	MS	95	6.0	0.80	Pass

AR: As Received
SW: Simulated Wear
TC: Temperature Conditioned
MS: Mechanical strength

BSI PRODUCT SERVICES
BS EN 149:2001
EXAMINATION AND TEST (CONTINUED)

Model Type :- HY9320 FFP1/2 Foldable Masks

<table>
<tr><th>CLAUSE</th><th>REQUIREMENT</th><th>ASSESSMENT</th></tr>
<tr><td>7.11</td><td>Flammability</td><td>N/As (1)</td></tr>
<tr><td>7.12</td><td>Carbon dioxide content of inhalation air
The carbon dioxide content of the inhalation air (dead space) shall not exceed an average of 1.0% (by volume). Test in accordance with clause 8.7 of the standard.

Table D: Carbon dioxide content of the inhalation air
<table>
<tr><th>Sample No</th><th>Pre-test condition</th><th>Maximum Specified CO_2 (%)</th><th>Actual CO_2 (%)</th></tr>
<tr><td>13</td><td>AR</td><td>1.0</td><td>0.74</td></tr>
<tr><td>14</td><td>AR</td><td>1.0</td><td>0.85</td></tr>
<tr><td>15</td><td>AR</td><td>1.0</td><td>0.76</td></tr>
</table></td><td>See Table D</td></tr>
<tr><td></td><td>A total of 9 valveless filtering half masks shall be tested: 3 as received, 3 after temperature conditioning in accordance with clause 8.3.2, and 3 after the test for simulated wearing in accordance with clause 8.3.1. Test in accordance with clause 8.9 of the standard.

A total of 12 valved particle filtering half masks shall be tested: 3 as received, 3 after temperature conditioning in accordance with clause 8.3.2, 3 after the test for simulated wearing in accordance with clause 8.3.1, and 3 after the flow conditioning in accordance with clause 8.3.4. Test in accordance with clause 8.9 of the standard.</td><td>See Tables E, F and G

See Tables E, F and G</td></tr>
<tr><td>7.13</td><td>Head harness
The head harness shall be designed so that the particle filtering half mask can be donned and removed easily. 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. Test in accordance with clauses 8.4 and 8.5 of the standard.</td><td>N/Ap (1)</td></tr>
</table>

N/Ap: Not Applicable N/As: Not Assessed

(1) Not required by BSI Product Certification.

(2) Not applicable to this product.

BSI PRODUCT SERVICES
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EXAMINATION AND TEST (CONTINUED)

Model Type :- HY9320 FFP1/2 Foldable Masks

CLAUSE	REQUIREMENT	ASSESSMENT
7.14	**Field of vision** The field of vision is acceptable if determined so in practical performance tests. Test in accordance with clause 8.4.	N/Ap (1)
7.15	**Exhalation valves** A particle filtering half mask may have one or more exhalation valve(s), which shall function correctly in all orientations. Test in accordance with clauses 8.2 and 8.9.1 If an exhalation valve is provided it shall be protected against, or be resistant to, dirt and mechanical damage and may be shrouded or may include any other device that may be necessary for the particle filtering half mask to comply with 7.9. Test in accordance with clause 8.2 of the standard. Exhalation valve(s), if fitted, shall continue to operate correctly after a continuous exhalation flow of 300 l/min over a period of 30 s. Test in accordance with clause 8.3.4. When the exhalation valve housing is attached to the faceblank, it shall withstand axially a tensile force of 10 N applied for 10 seconds. Test in accordance with clause 8.8.	N/Ap (1)
7.16	**Breathing resistance** The breathing resistances apply to valved and valveless particle filtering half masks and shall meet the requirements of Table 2 of the standard. A total of 9 valveless filtering half masks shall be tested: 3 as received, 3 after temperature conditioning in accordance with clause 8.3.2, and 3 after the test for simulated wearing in accordance with clause 8.3.1. Test in accordance with clause 8.9 of the standard. A total of 12 valved particle filtering half masks shall be tested: 3 as received, 3 after temperature conditioning in accordance with clause 8.3.2, 3 after the test for simulated wearing in accordance with clause 8.3.1, and 3 after the flow conditioning in accordance with clause 8.3.4. Test in accordance with clause 8.9 of the standard.	(See Tables E, F and G) (See Tables E, F and G)

N/Ap: Not Applicable

(1) Not applicable to this product.

BSI PRODUCT SERVICES
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EXAMINATION AND TEST (CONTINUED)

Model Type :- HY9320 FFP1/2 Foldable Masks

CLAUSE	REQUIREMENT	ASSESSMENT
7.16	**Breathing resistance (continued)**	

Table E: Inhalation resistance @ 30 l/min

Sample No	Pre-test condition	Continuous flow (l/min)	Maximum specified inhalation resistance (mbar)	Actual inhalation resistance (mbar)	
1	AR	30	0.6	0.33	Pass
2	AR	30	0.6	0.35	Pass
3	AR	30	0.6	0.33	Pass
4	TC	30	0.6	0.30	Pass
5	TC	30	0.6	0.33	Pass
6	TC	30	0.6	0.32	Pass
7	SW	30	0.6	0.38	Pass
8	SW	30	0.6	0.33	Pass
9	SW	30	0.6	0.34	Pass

Table F: Inhalation resistance @ 95 l/min

Sample No	Pre-test condition	Continuous flow (l/min)	Maximum specified inhalation resistance (mbar)	Actual inhalation resistance (mbar)	
1	AR	95	2.1	0.99	Pass
2	AR	95	2.1	1.04	Pass
3	AR	95	2.1	0.99	Pass
4	TC	95	2.1	0.91	Pass
5	TC	95	2.1	0.98	Pass
6	TC	95	2.1	0.99	Pass
7	SW	95	2.1	1.10	Pass
8	SW	95	2.1	0.97	Pass
9	SW	95	2.1	1.04	Pass

AR: As Received
SW: Simulated Wear

TC: Temperature Conditioned
FT: Flow tested at 300 l/min for 30 seconds

BSI PRODUCT SERVICES
BS EN 149:2001

EXAMINATION AND TEST (CONTINUED)

Model Type :- HY9320 FFP1/2 Foldable Masks

<table>
<tr><th>CLAUSE</th><th>REQUIREMENT</th><th>ASSESSMENT</th></tr>
<tr><td>7.16</td><td>Breathing resistance (continued)

Table G: Exhalation resistance @ 160 l/min measured in five orientations - worst case recorded.
<table>
<tr><th>Sample No</th><th>Pre-test condition</th><th>Continuous flow (l/min)</th><th>Maximum specified exhalation resistance (mbar)</th><th>Actual exhalation resistance (mbar)</th></tr>
<tr><td>1</td><td>AR</td><td>160</td><td>3.0</td><td>1.53</td></tr>
<tr><td>2</td><td>AR</td><td>160</td><td>3.0</td><td>1.58</td></tr>
<tr><td>3</td><td>AR</td><td>160</td><td>3.0</td><td>1.52</td></tr>
<tr><td>4</td><td>TC</td><td>160</td><td>3.0</td><td>1.50</td></tr>
<tr><td>5</td><td>TC</td><td>160</td><td>3.0</td><td>1.63</td></tr>
<tr><td>6</td><td>TC</td><td>160</td><td>3.0</td><td>1.59</td></tr>
<tr><td>7</td><td>SW</td><td>160</td><td>3.0</td><td>1.75</td></tr>
<tr><td>8</td><td>SW</td><td>160</td><td>3.0</td><td>1.64</td></tr>
<tr><td>9</td><td>SW</td><td>160</td><td>3.0</td><td>1.71</td></tr>
</table></td><td>Pass</td></tr>
</table>

AR: As Received
SW: Simulated Wear
TC: Temperature Conditioned
FT: Flow tested at 300 l/min for 30 seconds