Test Report

BSi Product Services

Report No	255/7010537 This Report consists of 10 pages
Licence/Cert. No	CE 70730
Client	Handan Hengyong Protective and Clean Products Company Limited 1-1-1201, 455 Gongnong Road Shijiazhuang, Hebei Republic of China 050051
Authority & date	BSI Product Services: Service Management Order No 7010537 dated 1 March 2007 Equipment Record No10086295
Items tested	Model: Fifty (50) off Handan Hengyong FFP3 Large Conical Masks
Specification	Limited testing to BS EN 149:2001 Respiratory protective devices – Filtering half masks to protect against particles Incorporating Corrigendum No 1 & BS EN 143:2000 Incorporating Corrigenda Nos 1 and 2 and Amendment No 1 Respiratory protective devices
Results	See Assessment Summary
Prepared by	N Rolls N Roll Test Technician
Authorized by	M Thompson MThompson Senior Engineer
Issue Date	28 June 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.

UKAS TESTING 0135

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BS EN 149:2001

SPECIFICATION:- Limited testing to BS EN 149:2001 Respiratory protective devices – Filtering half masks to protect against particles Incorporating Corrigendum No 1 & BS EN 143:2000 Incorporating Corrigenda Nos 1 and 2 and Amendment No 1 Respiratory protective devices (see Assessment Summary for details)

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

MODEL: FFP3 Large Conical Masks

NUMBER OF SAMPLES & SIZES: Thirty (30) samples submitted

ER NO: 10086295

DATE RECEIVED: 15 February 2007
DATE STARTED: 15 march 2007

MANUFACTURER'S CLAIMED EQUIPMENT PERFORMANCE:-
Filter classification: FFP3

INTRODUCTION

The samples detailed above were a certified model submitted by the Client for a Limited test programme to assess the product.

EN 149 specifies that the penetration of filter material assessment is to be conducted in accordance with EN 143. The EC Presumption of Conformity of EN 143 has been withdrawn due to concerns regarding the validity of the specified filter penetration tests and an amendment, referenced above, has been drafted to resolve the issue. As the product had not previously been assessed to this amendment additional penetration tests to the requirements of the draft have been included in the test programme in order to demonstrate the products compliance with the Basic Health and Safety Requirements of the EC Personal Protective Equipment Directive in respect of filter penetration.

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

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

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**	N/As (1)	-
7.2	**Nominal values and tolerances**	N/As (1)	-
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	Pass	Page 4
7.9.2	Penetration of filter material	N/As (1)	-
(3)	Penetration of filter material in accordance with BS EN 143:2000/ A1:2006	Pass	Pages 5 - 6
7.10	**Compatibility with skin**	N/As (1)	-
7.11	**Flammability**	N/As (1)	-
7.12	**Carbon dioxide content of inhalation air**	Pass	Page 7
7.13	**Head harness**	N/As (1)	-
7.14	**Field of vision**	N/As (1)	-
7.15	**Exhalation valve(s)**	N/Ap (2)	-
7.16	**Breathing resistance**	N/As (1)	-
7.17	**Clogging**	Pass	Pages 8 - 9
7.18	**Demountable parts**	N/Ap (2)	-
9	**Marking**	N/As (1)	-
10	**Information to be supplied by the manufacturer**	N/As (1)	-
APPENDIX A: Test Panel Data		-	Page 9

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

(1) Testing not requested by BSI Product Certification.
(2) Not a design feature of this mask.
(3) See Introduction on Page 2.
(4) See Page 9.

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EXAMINATION AND TEST (CONTINUED)

Model Type :- FFP3 Large conical masks HY9630 & HY9632

CLAUSE	REQUIREMENT	ASSESSMENT
7.9 7.9.1	**Leakage** Total inward leakage 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 is fitted) and filter penetration. 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 25% for FFP1, 11% for FFP2, 5% for FFP3 and, in addition, at least 8 out of the 10 individual wearer arithmetic means for the total inward leakage shall be not greater than 22% for FFP1, 8% for FFP2, 2% for FFP3. Test in accordance with clause 8.5 of the standard.	Pass See Table A

Table A: Total Inward Leakage Results

Test Panel Member	Pre-test condition	Sample No	A Walking (%)	B Walking with head side to side (%)	C Walking with head up & down (%)	D Walking and talking (%)	E Walking (%)	Average (%)
MT2	AR	AR1	0.0055	0.0218	0.0105	0.0053	0.0024	0.0091
GB1	AR	AR2	0.0601	0.0317	0.0118	0.0071	0.0131	0.0248
JN1	TC	TC3	0.0314	0.0130	0.0112	0.0120	0.0065	0.0148
RH1	TC	TC4	0.0544	0.1193	0.0614	0.0233	0.0272	0.0571
AT1	TC	TC5	0.0080	0.0089	0.0110	0.0160	0.0071	0.0102

AR: As Received TC: Temperature Conditioned

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EXAMINATION AND TEST (CONTINUED)

Additional testing to EN 143:2000, Clause 8.7, filter penetration - sodium chloride.

EN 143:2000 + A1 2006

CLAUSE	REQUIREMENT/TEST PROCEDURE (paraphrased)	ASSESSMENT
8.7.2	**For single shift use filters** Test the filter until it has been exposed to 120 mg of Sodium Chloride unless the penetration shows a continued decline over a 5 minute period or over 5 sampling intervals, whichever is the greater. Maximum permitted penetration 1.0%.	See Table B below

Table B: Filter penetration - Sodium Chloride

	Sample 6	Sample 7	Sample 8
Pre-test condition	Mechanical strength and Temperature Conditioning		
Flow through filter	95 l/min		
Elapsed Time in Minutes	Actual Penetration % (Maximum permitted penetration 1.0%)		
5	0.314188	0.183726	0.086740 (1)
10	0.283208	0.178347	0.081204
15	0.280856	0.162716	0.075992
20	0.257878	0.156035	0.070936
25	0.374863	0.160436	0.065087
30	0.350314	0.195012	0.059193
35	0.345564	0.201620	
40	0.375376	0.179630	
45	0.469577	0.179112	
50	0.556360	0.171430	
55	0.538014	0.169931	
60	0.520358	0.180074	
65	0.586495	0.192309	
70	0.621231	0.194678	
75	0.573382	0.216946	
80	0.603173	0.226131	
85	0.342883	0.223598	
90	0.342881	0.229002	
95	0.389236	0.215349	
100	0.358411	0.221910	
105	0.319419	0.219642	
110	0.319419 (2)	0.215421	
115		0.223695 (2)	
Assessment:	Pass	Pass	Pass

(1) 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 clause 7.8.2.

(2) The filter has been exposed to 120 mg of Sodium Chloride.

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EXAMINATION AND TEST (CONTINUED)

Additional testing to EN 143:2000, Clause 8.7, filter penetration - Paraffin Oil penetration.

EN 143: 2000 + A1 2006

CLAUSE	REQUIREMENT/TEST PROCEDURE (paraphrased)	ASSESSMENT
8.7.2	**For single shift use filters** Test the filter until it has been exposed to 120 mg of Paraffin Oil. Maximum permitted penetration 1.0%.	See Table below C

Table C Filter penetration - Paraffin Oil

	Sample 6	Sample 7	Sample 8
Pre-test condition	Mechanical strength and Temperature Conditioning		
Flow through filter	95 l/min		
Elapsed Time in Minutes	Actual Penetration % (Maximum permitted penetration 1.0%)		
3	0.85	0.23	0.83
5	0.85	0.30	0.83
10	0.85	0.25	0.83
15	0.90	0.29	0.83
20	0.90	0.25	0.92
25	0.90	0.29	0.83
30	0.85	0.33	0.83
35	0.90	0.29	0.92
40	0.85	0.29	0.92
45	0.90 (2)	0.29	0.92
50	0.60	0.29	0.96
55	0.60	0.29	0.96
60	0.60	0.29	0.96
63(1)	0.60	0.29	0.96
Assessment:	Pass	Pass	Pass

(1) A loading of 120 mg was achieved after a period of 63 minutes had elapsed.
(2) Final penetration value 0.60%. Chamber concentration drift, resulting in samples taken between 3 and 45 mins void.

EXAMINATION AND TEST (CONTINUED)

Model Type :- FFP3 Large conical masks HY9630 & HY9632

CLAUSE	REQUIREMENT	ASSESSMENT
7.12	**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	Pass See Table D

Sample No	Pre-test condition	Maximum Specified CO_2 (%)	Actual CO_2 (%)	
9	AR	1.0	0.75	Pass
10	AR	1.0	0.55	Pass
11	AR	1.0	0.70	Pass

CLAUSE	REQUIREMENT	ASSESSMENT
7.17 7.17.1	**Clogging** General For single-use devices only, the clogging test is an optional test. Devices designed to be resistant to clogging, shown by a slow increase of breathing resistance when loaded with dust, shall be subjected to the treatment described in clause 8.10. The specified breathing resistances shall not be exceeded before the required dust load of 833 mg.h/m^3 is reached.	Pass Pass
7.17.2 7.17.2.1	**Breathing Resistance** Valved particle filtering half masks	N/Ap (1)
7.17.2.2	Valveless particle filtering half masks After clogging the inhalation and exhalation resistance shall not exceed: - FFP1: 3 mbar - FFP2: 4 mbar - FFP3: 5 mbar at 95 l/min continuous flow. Test in accordance with clause 8.9.	Pass (See Tables E and F)

N/Ap: Not Applicable AR: As Received

(1) Not applicable to this product. The samples are valveless particle filtering half masks.

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EXAMINATION AND TEST (CONTINUED)

CLAUSE	REQUIREMENT					ASSESSMENT
7.17.2	**Breathing resistance (continued)** Table E: Inhalation resistance - post clogging					
	Sample No	Pre-test condition	Continuous flow through filter (l/min)	Maxi spec inhalation resistance (mbar)	Actual inhalation resistance (mbar)	
	12	AR	95	5.0	1.77	Pass
	13	TC	95	5.0	2.11	Pass
	14	TC	95	5.0	2.13	Pass
	Table F: Exhalation resistance - post clogging measured in five orientations - worst case recorded					
	Sample No	Pre-test condition	Continuous flow through filter (l/min)	Max spec exhalation resistance (mbar)	Actual exhalation resistance (mbar)	
	12	AR	95	5.0	2.12	Pass
	13	TC	95	5.0	2.52	Pass
	14	TC	95	5.0	2.59	Pass

AR: As Received TC: Temperature Conditioned

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EXAMINATION AND TEST (CONTINUED)

CLAUSE	REQUIREMENT	ASSESSMENT
7.17.3	Filter penetration All types (valved and valveless) of particle filtering half masks claimed to meet the clogging requirement shall also meet the penetration requirements given in 7.9.2 after the treatment. Test in accordance with clause 8.11 of the standard	Pass See Tables G and H

Table G: Sodium chloride penetration - post clogging

Sample No	Pre-test condition	Flowrate through filter (l/min)	Max spec. penetration (%)	Actual penetration (%)	
12	AR	95	1	0.402220	Pass
13	TC	95	1	0.103263	Pass
14	TC	95	1	0.131004	Pass

Table H: Paraffin oil penetration - post clogging

Sample No	Pre-test condition	Flowrate through filter (l/min)	Max spec. penetration (%)	Actual penetration (%)	
12	AR	95	1	0.52	Pass
13	TC	95	1	0.55	Pass
14	TC	95	1	0.60	Pass

AR: As Received TC: Temperature Conditioned

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APPENDIX A - TEST PANEL DATA

	FACIAL DIMENSIONS (mm)				
Initials	Length of face	Width of face	Face depth	Width of mouth	Sex
GB1	125	160	120	55	M
JN1	130	150	135	55	M
MT2	119	150	130	51	M
RH1	129	138	138	50	M
AT1	120	152	100	50	M

Note: All persons were clean shaven.