INSPEC

UKAS TESTING 0316

56 LESLIE HOUGH WAY • SALFORD • GREATER MANCHESTER • M6 6AJ • UNITED KINGDOM
Email: testing@inspec-international.com Website: www.inspec-international.com
Tel: +44 (0) 16 17 37 06 99 Fax: +44 (0) 16 17 36 01 01

Test Report

EN 149 : 2001

Report no:	07.04.08
Client:	INSPEC Asia Pacific Room 805 Suncome Liauw's Plaza 738 Shang Cheng Road, Pu Dong Shanghai 200120 China
Client order:	TS07/3539
Order(s) received:	13 February 2007
Manufacturer:	Shanghai Dasheng Health Product Manufacture Co Ltd
Model(s):	DTC3X, DTC3X-F
Date(s) of tests:	5 March to 3 April 2007

Conditions:

Opinions, comments and interpretations expressed herein are outside the scope of UKAS accreditation and shown in italics in this report. Any INSPEC interpretations are referenced in this report and copies are available upon request.

Tests marked ☒ are not included in the UKAS accreditation schedule for INSPEC.

Samples will be disposed of four weeks from the date of this report.

Checked: M.P. Formstone M.P. Formstone Approved: P. Threlfall P. Threlfall

Issued: 3 April 2007

Summary of assessment*

Clause		Assessment	
		DTC3X	DTC3X-F
7.4	Packaging		
7.5	Material		Ltd
7.6	Cleaning and disinfecting		
7.7	Practical performance	Ltd	
7.8	Finish of parts		
7.9.1	Total inward leakage		Pass
7.9.2	Penetration of filter material: Sodium chloride		Pass
7.9.2	Penetration of filter material: Paraffin oil		Pass
7.10	Compatibility with skin		
7.11	Flammability		
7.12	Carbon dioxide content of the inhalation air	Pass	
7.13	Head harness	Ltd	
7.14	Field of vision	Ltd	
7.15	Exhalation valve(s)		Ltd
7.16	Breathing resistance	Pass	
7.17	Clogging		
7.18	Demountable parts		
9	Marking		
10	Information to be supplied by the manufacturer		

Key

	Highlighting shows the clauses requested for each model. Any other clauses were not requested.
Pass	Requirement satisfied.
Ltd	Testing was insufficient to completely verify compliance with clause. Refer to "Procedures / Result detail".
Fail	Requirement not satisfied. Refer to the "Result detail" section for more information.
NAs	Assessment not carried out.
NAp	Requirement not applicable.
NT	Requested but not tested due to early termination following failure.

* Assessment relates only to those items tested in this report.

Product characteristics

Property	Characteristic	
Model	DTC3X	DTC3X-F
Classification	Undetermined	Undetermined
Exhalation valve(s)	None	Single
Usage	Single	Single

Sample details

Product	Quantity	Received	INSPEC no. (S116 +)
DTC3X filtering facepiece	10	14 Feb 07	101 – 158
DTC3X-F filtering facepiece	50		201 – 259

Procedures

Testing was performed in accordance with EN 149 : 2001, unless specified otherwise below.

7.7 The client instructed that practical performance testing be carried out on one sample of the DTC3X model only.

Practical performance tests were conducted in simulation of the practical use of the apparatus under the conditions prevailing in the gallery area of the laboratory. The exercises undertaken and the equipment used were as specified in the standard.

7.9.2 Filter penetration testing by the paraffin oil method was carried out using a modified Phoenix SG-20 aerosol generator and a Phoenix model JM-6000 photometer or a TEC Services' model PH-3 photometer. These give similar performance to the instruments specified.

7.16 Exhalation resistance was tested at a continuous flow of 160 l/min.

In addition, the client requested testing to establish filter penetration performance during exposure to 120mg of test aerosol. Results are included at the end of the "Result detail" section. ☒

This testing was carried out in accordance with 7.9.2 extended to 120mg exposure, on samples as follows.

Three samples were tested against each test aerosol, following mechanical strength conditioning in accordance with 8.3.3 and temperature conditioning in accordance with 8.3.2.

Peak penetration during exposure is reported and the penetration after three minutes for comparison purposes.

Result detail

7.5 Material

Model DTC3X

Samples 223 to 228 were conditioned in accordance with 8.3.1. **Pass**

Samples 206 to 210, 217 to 222 and 253 to 259 were conditioned in accordance with 8.3.2. **Pass**

The effects of filter media release were not assessed. Manufacturer to certify. **NAs**

7.7 Practical performance

Model DTC3X

Sample and subject details:

Sample	Subject	
148	MDC	**Pass**
149	-	**NAs**

No adverse comments were made following testing.

7.9.1 Total inward leakage (%)

Model DTC3X-F

Subject	Sample	Cond	Walk	Head side/side	Head up/down	Talk	Walk	Mean
PBU	**201**	**AR**	0.14	0.25	1.92	0.15	0.16	0.52
BH	**202**	**AR**	0.60	0.49	0.65	0.32	0.60	0.53
CDW	**203**	**AR**	0.07	0.08	0.07	0.10	0.08	0.08
RMH	**204**	**AR**	0.09	0.08	0.07	0.13	0.06	0.09
MDC	**205**	**AR**	0.24	0.27	0.50	0.63	0.42	0.41
JU	**206**	**TC**	0.15	0.15	0.19	0.28	0.23	0.20
CPB	**207**	**TC**	0.25	0.18	1.19	4.39	0.34	1.27
INH	**208**	**TC**	0.13	0.09	0.11	0.14	0.09	0.11
NRA	**209**	**TC**	1.00	1.53	0.66	0.21	0.25	0.73
PT	**210**	**TC**	0.45	0.32	0.27	0.25	0.16	0.29
Maximum permitted (FFP3)			**5**					**2**

All 50 individual exercise results were less than 5% **Pass**

All 10 individual wearer arithmetic means were less than 2% **Pass**

Subject facial dimensions:

Subject	Length (mm)	Width (mm)	Depth (mm)	Width (mm)
PBU	116	141	90	52
BH	125	136	109	52
CDW	117	151	121	60
RMH	112	148	117	49
MDC	120	146	114	57
JU	119	153	135	53
CPB	116	154	121	62
INH	125	153	95	58
NRA	124	137	107	49
PT	118	139	120	54

7.9.2 Penetration of filter material

Model DTC3X-F

Sodium chloride: **Pass**

Sample	Condition	Penetration (%)
211	**A.R.**	0.15
212		0.10
213		0.10
217	**T.C.**	0.10
218		0.08
219		0.10
223	**S.W.**	0.16
224		0.11
225		0.09
229	**M.S.**	0.16
230		0.10
231		0.10
Maximum permitted (FFP3)		**1.0**

Paraffin oil: **Pass**

Sample	Condition	Penetration (%)
214	**A.R.**	0.19
215		0.21
216		0.24
220	**T.C.**	0.38
221		0.35
222		0.36
226	**S.W.**	0.22
227		0.20
228		0.27
232	**M.S.**	0.90
233		0.21
234		0.23
Maximum permitted (FFP3)		**1.0**

7.12 Carbon dioxide content of the inhalation air

Model DTC3X **Pass**

Sample	CO_2 (%)
111	0.77
112	0.82
113	0.83
Maximum permitted	**1.0**

7.13 Head harness

The head harness was donned and removed easily during limited practical performance and total inward leakage testing.

The head harness was self-adjusting and there were no adverse comments regarding security following limited practical performance and total inward leakage testing.

The product satisfied the total inward leakage requirements. See 7.9.1 for results. **Pass**

7.14 Field of vision

Model DTC3X

There were no adverse comments following limited practical performance tests.

7.15 Exhalation valve

Model DTC3X-F

The valve housing withstood 10N applied for 10s. Samples 212 (A.R.), 219 (T.C.) and 229 (M.S.) were tested. **Pass**

7.16 Breathing resistance **Pass**

Model DTC3X

Sample	Condition	Inhalation resistance (mbar)		Exhalation resistance (mbar)
		At 30 l/min	At 95 l/min	At 160 l/min
111	**A.R.**	0.43	1.60	2.32
112		0.41	1.58	2.35
113		0.46	1.63	2.50
117	**T.C.**	0.41	1.52	2.26
118		0.40	1.56	2.30
119		0.42	1.55	2.33
123	**S.W.**	0.44	1.50	2.42
124		0.63	2.18	2.94
125		0.45	1.56	2.44
Maximum permitted (FFP2)		**0.7**	**2.4**	**3.0**

Sample 124 (S.W.) did not meet the inhalation resistance requirements for classification FFP1, however it did meet the requirements for both FFP2 and FFP3.

Additional Performance Testing

Model DTC3X-F

Penetration of filter material (Sodium Chloride)

Sample	Condition	Penetration (%)	
		after 3 min	max. during exposure ☒
253	M.S. + T.C.	0.07	0.07
254		0.08	0.08
255		0.24	0.25
Maximum permitted (FFP3)		1.0	

Penetration of filter material (Paraffin Oil)

Sample	Condition	Penetration (%)	
		after 3 min	max. during exposure ☒
257	M.S. + T.C.	0.28	0.38
258		0.29	0.40
259		0.37	0.43
Maximum permitted (FFP3)		1.0	

ANNEX

This Annex comprises two sections.

1. Estimates of the uncertainty of measurement (1 page)

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Estimates of the uncertainty of measurement

Clause	Test	Uncertainty
7.9.1	Total inward leakage	4.7%
7.9.2	Penetration of filter material - Sodium chloride	4.7%
7.9.2	Penetration of filter material - Paraffin oil	5.0%
7.12	CO_2 content of the inhalation air	4.0%
7.16	Breathing resistance	1.8%
7.17.2	Breathing resistance after clogging	1.8%
7.17.3	Filter penetration after clogging - Sodium chloride	4.7%
7.17.3	Filter penetration after clogging - Paraffin oil	5.0%

Values expressed as a percentage (%) are relative.

It should be noted that the above values have not been taken into account when making assessment to the pass/fail criteria