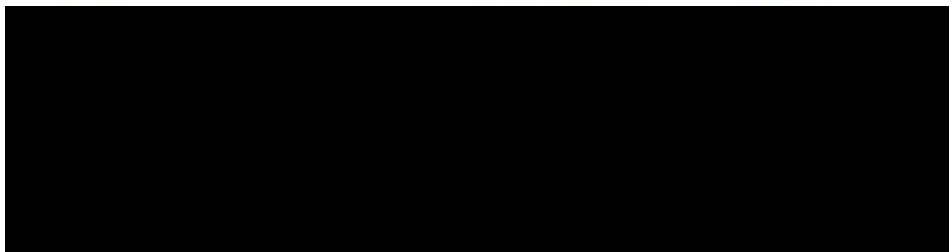


Test Report

EN 149 : 2001 + A1 : 2009

Report no: 1.12.01.10



Order(s) received: 8 December 2011 to 10 January 2012



Date(s) of tests: 9 December 2011 to 11 January 2012

Signed:



Peter Threlfall, Laboratory Supervisor.

Issued: 11 January 2012

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Summary of assessment*

Clause	Requirement	Assessment	
		HSD-F02	HSD-F02V
	Model:		
7.4	Packaging	Ltd	
7.5	Material	Ltd	Fail
7.6	Cleaning and disinfecting		
7.7	Practical performance	Ltd	Ltd
7.8	Finish of parts	Ltd	Ltd
7.9.1	Total inward leakage		Fail
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	Ltd	Ltd
7.11	Flammability		Pass
7.12	Carbon dioxide content of the inhalation air	Pass	
7.13	Head harness	Ltd	Ltd
7.14	Field of vision	Ltd	Ltd
7.15	Exhalation valve(s)		Ltd
7.16	Breathing resistance	Ltd	Pass
7.17	Clogging		
7.18	Demountable parts		NAp
9	Marking	Fail	Fail
10	Information to be supplied by the manufacturer	Fail	Fail

Key

	Shading shows the clauses requested. Any other clauses were not requested.
Pass	Requirement satisfied.
Ltd	Testing requested was insufficient completely to verify compliance with the clause. Refer to the "Result details" section for more information.
Fail	Requirement not satisfied. Refer to the "Result details" 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 specimens which were tested and are the subject of this report.

Product characteristics

Property	Characteristic	
Model	HSD-F02	HSD-F02V
Classification claimed	FFP2	FFP2
Exhalation valve(s)	None	Single
Usage designation	NH	NH

Submission details

Product	Quantity	Date Received	INSPEC specimen no. (1X0902 +)
HSD-F02 filtering half mask	30	5 December 2011	111 to 160
HSD-F02V filtering half mask	65		201 to 260

Procedures

The specimens detailed within the submissions above were used for the tests covered by this report.

Testing was performed in accordance with BS FN 149 : 2001 incorporating Corrigendum No. 1 (January 2003), and amendment A1 (2009) unless otherwise specified below. Reference should be made to the standard when reading this report.

Unless stated otherwise, specimens were tested in the condition as received by INSPEC.

- 7.7** The client instructed that practical performance testing be carried out on one specimen of each model.
- 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 PI I-3 photometer. These give similar performance to the instruments specified.
- For the 120mg exposure test, the peak penetration during exposure is reported and in addition the penetration after three minutes for comparison purposes.
- During the 120mg exposure test, the sodium chloride penetration showed continued decline and the test was terminated as the product was marked NH.
- 7.16** Exhalation resistance was tested at a continuous flow of 160 l/min.

Result details**7.4 Packaging****Model HSD-F02**

The masks were not packaged as offered for sale. Manufacturer to certify regarding the final packaging to be used. **NAs**

The masks were packaged in clear plastic bags inside a large cardboard box that gave some protection against mechanical damage or contamination before use. **Pass**

7.5 Material**Model HSD-F02**

Specimens 120 to 122 were conditioned in accordance with 8.3.1. None of the specimens conditioned suffered mechanical failure or collapse. **Pass**

Specimens 117 to 119 were conditioned in accordance with 8.3.2. None of the specimens conditioned suffered collapse. **Pass**

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

Model HSD-F02V

During inward leakage testing to 7.9.1, it was observed that specimens 201 and 204 (A.R.) and 208 (T.C.) had developed a split along the welded seam. Subsequent to testing, the other specimens were examined and a similar split was noticed on specimen 222. **Fail**

Specimens 220 to 225 were conditioned in accordance with 8.3.1. Specimen 222 was later observed to have a split along the welded seam. It could not be determined if this was due to conditioning. **NAs**

Specimens 206 to 210, 217 to 219, 226 to 231, 233, 239, 240, 246 and 247 were conditioned in accordance with 8.3.2. Specimen 208 was later observed to have a split along the welded seam. It could not be determined if this was due to conditioning. **NAs**

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

7.7 Practical performance

Model HSD-F02

Specimen and subject details:

Specimen	Subject	Pass NAs
148	PBU	
149	-	

No adverse comments were made following testing.

Model HSD-F02V

Specimen and subject details:

Specimen	Subject	Pass NAs
248	KCV	
249	-	

No adverse comments were made following testing.

7.8 Finish of parts

Model HSD-F02

None of the specimens used in the limited laboratory testing undertaken showed evidence of sharp edges or burrs.

Ltd

Model HSD-F02V

None of the specimens used in the limited laboratory testing undertaken showed evidence of sharp edges or burrs.

Ltd

7.9.1 Total inward leakage (%)

Model HSD-F02V

Subject	Specimen	Cond	Walk	Head side/side	Head up/down	Talk	Walk	Mean
SS	201	AR	20.94	20.43	18.91	15.2	19.48	18.99
PBU	202	AR	0.93	1.02	1.47	0.55	0.09	1.13
INH	203	AR	16.01	14.11	13.75	7.73	11.36	12.59
ED	205	AH	1.81	1.44	1.78	1.65	1.46	1.63
KCV	251	AR	1.71	8.15	11.25	5.06	6.92	6.62
AH	206	TC	0.78	0.72	1.18	1.22	0.66	0.91
KDS	207	TC	0.65	2.02	2.47	1.78	0.29	1.44
SNT	208	TC	0.99	1.04	1.46	5.96	2.56	2.40
GW	209	TC	0.05	0.07	0.10	0.83	0.06	0.22
	210	TC	Not tested					
Maximum permitted			11					8

35 out of 45 individual exercise results were not greater than 11%.

Fail

7 out of 9 individual wearer arithmetic means were not greater than 8%.

Fail

It was observed that specimens 201 and 208 had a split along the welded seam. It could not be determined if this occurred prior to or during the test, neither could it be determined if the high figures recorded for specimen 201 were due to this observed split

Specimen 204 was observed to have a split and was rejected prior to testing.

Subject facial dimensions:

Subject	Face Length (mm)	Face Width (mm)	Face Depth (mm)	Mouth Width (mm)
SS	108	148	120	58
PBU	116	141	90	52
INH	125	150	95	58
ED	114	138	100	47
KCV	106	143	133	56
AH	119	113	115	50
KDS	102	128	98	49
SNT	119	151	121	40
GW	117	133	120	53

7.9.2 Penetration of filter material

Model HSD-F02V

Sodium chloride

Pass

Specimen	Condition	Penetration (%)	
		After 3 mins	Max during exposure
211	A.R.	0.11	
212		0.12	
213		0.08	
220	S.W.	0.12	
221		0.16	
222		1.02	
226	M.S. + T.C.	0.11	0.11
227		0.10	0.10
228		0.21	0.21
Maximum permitted		6.0	

Paraffin oil:

Specimen	Condition	Penetration (%)	
		After 3 mins	Max during exposure
214	A.R.	0.67	
215		0.73	
216		0.59	
223	S.W.	0.73	
224		0.81	
225		0.77	
229	M.S. + T.C.	0.88	1.29
230		0.85	1.12
231		1.02	2.12
Maximum permitted		6.0	

7.10 Compatibility with skin

Model HSD-F02

No problems were encountered during limited practical performance testing.

Ltd

Total inward leakage testing was not carried out.

NAs

The likelihood of materials in contact with the skin causing irritation or other adverse effect on health was not assessed. Manufacturer to certify.

NAs

Model HSD-F02V

No problems were encountered during limited practical performance testing.

Ltd

No problems were encountered during limited total inward leakage testing.

Ltd

The likelihood of materials in contact with the skin causing irritation or other adverse effect on health was not assessed. Manufacturer to certify.

NAs

7.11 Flammability

Model HSD-F02V

Specimens 244 and 245 (A.R.) and 246 and 247 (I.C.) were tested. None of the specimens ignited.

Pass

7.12 Carbon dioxide content of the inhalation air

Model HSD-F02

Pass

Specimen	CO ₂ (%)
135	0.92
136	0.94
137	0.99
Maximum permitted	1.0

7.13 Head harness**Model HSD-F02**

The head harness was designed to allow the particle filtering half-mask to be donned and removed easily during limited practical performance testing.

Ltd

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

Ltd

Inward leakage testing was not carried out.

NAs

Model HSD-F02V

The head harness was designed to allow the particle filtering half-mask to be donned and removed easily during limited practical performance and limited total inward leakage testing.

Ltd

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

Ltd

The product did not satisfy the total inward leakage requirements. See 7.9.1 for results. However, it was not possible to determine if security of the head harness was the cause of failure.

NAs

7.14 Field of vision**Model HSD-F02**

There were no adverse comments following limited practical performance tests.

Ltd

Model HSD-F02V

There were no adverse comments following limited practical performance tests.

Ltd

7.15 Exhalation valve**Model HSD-F02V**

There were no observed problems during testing of function in all orientations. See 7.16 for results.

Pass

The valve was protected against dirt and mechanical damage by a shroud.

Pass

The product did not satisfy the leakage requirements. See 7.9 for results. However, it was not possible to determine if the valve was the cause of failure.

NAs

There were no observed problems when assessing operation after high exhalation flow. See 7.16 for results.

Pass

The valve housing withstood 10N applied for 10s. Specimens 232 (A.R.), 233 (T.C.) and 234 (M.S.) were tested.

Pass

7.16 Breathing resistance**Model HSD-F02**

Ltd

Specimen	Condition	Inhalation resistance (mbar)		Exhalation resistance (mbar)
		At 30 l/min	At 95 l/min	At 160 l/min
111	A.R.	Not requested		1.00
112				1.87
113				1.99
117	T.C.	Not requested		1.92
118				2.17
119				2.05
120	S.W.	Not requested		2.00
121				2.00
122				2.02
Maximum permitted				3.0

Model HSD-F02V

Pass

Specimen	Condition	Inhalation resistance (mbar)		Exhalation resistance (mbar)
		At 30 l/min	At 95 l/min	At 160 l/min
211	A.R.	0.33	1.16	1.30
212		0.30	1.10	1.18
213		0.27	1.09	1.36
217	T.C.	0.36	1.17	1.22
218		0.32	1.12	1.30
219		0.35	1.21	1.45
220	S.W.	0.36	1.22	1.35
221		0.35	1.28	1.49
222		0.30	1.11	1.23
238	A.R. + F.C.	0.31	1.03	1.24
239	T.C. + F.C.	0.31	1.09	1.26
240		0.31	1.09	1.22
Maximum permitted		0.7	2.4	3.0

7.18 Demountable parts**Model HSD-F02V**

No demountable parts were used.

NAs

9	Marking	
	Both models	
9.1	Packaging	
	The specimens were submitted in transparent plastic bags inside large cardboard boxes.	
	The packaging was not marked.	Fail
9.2	Particle filtering half mask	
	The particle filtering half mask was clearly and durably marked.	Pass
	The markings required by the Standard were assessed as follows.	
9.2.1	The manufacturer's identification was not present.	Fail
9.2.2	Type identification was marked.	Pass
9.2.3	The number or year of the standard were not given.	Fail
9.2.4	No classification was marked.	Fail
9.2.5	Resistance to clogging was not claimed, and the letter "D" was not marked.	NAp
9.2.6	There were no sub-assemblies or components to mark for identification.	NAp
10	Information to be supplied by the manufacturer	
	Both models	
	INSPEC Testing Services has not assessed these instructions with respect to claims made by the manufacturer outside of the requirements of the Standard, and therefore accepts no responsibility for the legitimacy of any such claims.	
	The information specified by the Standard was assessed as follows.	
10.1	The information did not accompany smallest package, an example copy was sent.	Fail
10.2	Were in the official language (English).	Pass
10.3	Contained all necessary information for trained and qualified persons apart from;	
	- application/limitations;	Fail
	- colour codes were neither used or explained;	NAp
	- use;	Fail
	- maintenance information was not given, the mask was designated single use;	NAp
10.4	Were clear and comprehensible.	Pass
10.5	Required warnings were given against various problems likely to be encountered.	Pass
10.6	Discard information was provided.	Pass
10.7	The product was marked NR and the required warning was given.	Pass

Estimates of the uncertainty of measurement

Clause	Test	Uncertainty
7.4	Packaging	-
7.5	Material	*
7.6	Cleaning and disinfecting	-
7.7	Practical performance	*
7.8	Finish of parts	-
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	+ 4.1%
7.10	Compatibility with skin	-
7.11	Flammability	*
7.12	CO ₂ content of the inhalation air	± 4.0%
7.13	Head harness	-
7.14	Field of vision	*
7.15	Exhalation valve(s)	*
7.16	Breathing resistance	± 1.8%
7.17.2	Breathing resistance after clogging	± 3.9%
7.17.3	Filter penetration after clogging - Sodium chloride	± 4.7%
7.17.3	Filter penetration after clogging - Paraffin oil	± 4.1%
7.18	Demountable parts	-

* The acceptance criterion for this test is a straightforward "Pass/Fail", rather than a numerical value. Consequently, as there is no value to be reported, uncertainty has not been reported either.

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.

ANNEX

This Annex comprises one section.

1. Photographs of the products tested. (2 pages)



