

Test Report

EN 149 : 2001 + A1 : 2009

Particle filtering half masks

Report no: 1.19.06.28

Client: INSPEC Certification Services
56 Leslie Hough Way
Salford
Manchester
M6 6AJ
United Kingdom

Manufacturer: Jiangyin Chang-hung Industrial Manufacturing Factory LLC

Client order: TS19/6099

Order(s) received: 15 May 2019

Model(s): CDN-P3
CDN-P3C

Date(s) of tests: 16 May to 21 June 2019

Signed: 

Issued: 29 June 2019

Heather Webb, Laboratory Supervisor

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Opinions, comments and interpretations expressed in this report are shown in italics.

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Summary of assessment*

Clause	Model:	Assessment (see Key)	
		CDN-P3	CDN-P3C
7.4	Packaging	Ltd	
7.5	Material	Ltd	Ltd
7.6	Cleaning and disinfecting		
7.7	Practical performance	Ltd	Pass
7.8	Finish of parts	Ltd	Pass
7.9.1	Total inward leakage	Ltd	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	Ltd	Ltd
7.11	Flammability		Pass
7.12	Carbon dioxide content of the Inhalation air		Pass
7.13	Head harness	Ltd	Pass
7.14	Field of vision		Pass
7.15	Exhalation valve(s)	Ltd	Ltd
7.16	Breathing resistance		Pass
7.17	Clogging		
7.18	Demountable parts		NAp
8	Marking		
10	Information to be supplied by the manufacturer		

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.
NAa	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	CDN-P3	CDN-P3C
Classification claimed	FFP3 NR	
Exhalation valve(s)	One	

Submission details

Product	Quantity	Date received	INSPEC specimen no. (1G0248 +)
GRANDE CDN-P3 FFP3 NR filtering half mask	55	7 May 2019	103 to 163
GRANDE CDN-P3C FFP3 NR filtering half mask	65		201 to 260

Procedures

Specimens were selected at random from the submission(s) detailed above.

Testing was performed in accordance with BS EN 149 : 2001 incorporating corrigendum No. 1 (July 2002) and amendment A1 (March 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 only of model CDN-P3.

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.

7.9.1 At client's request, total inward leakage testing of model CDN-P3 was conducted on two specimens following temperature conditioning (T.C.) in accordance with 8.3.2 and on three specimens in the "as received" (A.R.) state only.

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.

For the 120 mg exposure test, the peak penetration during exposure is reported and in addition the penetration after three minutes for comparison purposes.

During the 120 mg exposure test, the sodium chloride penetration showed continued decline and the test was terminated as the product was marked NR.

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

Result details**7.4 Packaging****Model: CDN-P3**

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 in a printed carton boxes that gave some protection against mechanical damage or contamination before use.

Pass

7.5 Material**Model: CDN-P3**

The materials used were able to withstand handling and wear during laboratory testing.

Pass

The effect on materials from "in-use" environmental factors could not be evaluated during laboratory tests. Manufacturer to certify regarding such factors.

NAs

Specimens 120 to 125 were conditioned in accordance with 8.3.1. None of the specimens conditioned suffered mechanical failure or collapse.

Pass

Specimens 106, 107, 126 to 131, 133, 156, 157 and 161 to 163 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: CDN-P3C

The materials used were able to withstand handling and wear during laboratory testing.

Pass

The effect on materials from "in-use" environmental factors could not be evaluated during laboratory tests. Manufacturer to certify regarding such factors.

NAs

Specimens 220 to 222 were conditioned in accordance with 8.3.1. None of the specimens conditioned suffered mechanical failure or collapse.

Pass

Specimens 206 to 210, 217 to 219, 233, 239, 240, 246, 247 and 256 to 258 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

7.7 Practical performance**Model: CDN-P3****Specimen and subject details:**

Specimen	Subject
148	CKN
-	-

Pass**NAs**

The subject commented that there was some deformation of the nose band while talking.

Model: CDN-P3C**Specimen and subject details:**

Specimen	Subject
248	AH
250	RW

Pass**Pass**

No adverse comments were made following testing.

7.8 Finish of parts**Model: CDN-P3**

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

Ltd**Model: CDN-P3C**

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

Ltd

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7.9.1 Total Inward leakage (%)**Model: CDN-P3**

Subject	Specimen	Cond	Walk	Head side/ side	Head up/down	Talk	Walk	Mean
KRB	151	A.R.	0.52	0.48	0.48	0.79	0.63	0.58
INH	152	A.R.	1.14	1.00	0.82	0.59	0.52	0.81
SAH	105	A.R.	0.01	0.01	0.08	0.02	0.01	0.03
BH	106	T.C.	0.04	0.25	0.16	0.13	0.11	0.14
EM	158	T.C.	0.03	0.03	0.03	0.08	0.03	0.03
Maximum permitted					5			2

All 25 individual exercise results were not greater than 5%.

Ltd

All five individual wearer arithmetic means were not greater than 2%.

Ltd

Subject JLS was excluded from the test panel as they were unable to achieve a satisfactory fit.

Model: CDN-P3C

Subject	Spec.	Cond.	Walk	Head side/ side	Head up/down	Talk	Walk	Mean
INH	201	A.R.	0.38	0.24	0.41	0.23	0.16	0.29
SAH	202	A.R.	0.05	0.02	0.03	0.05	0.02	0.03
BH	203	A.R.	0.08	0.10	0.11	0.15	0.07	0.10
RW	251	A.R.	< 0.01	0.08	2.07	0.03	0.01	0.44
EM	254	A.R.	0.08	0.19	0.06	0.06	0.01	0.08
AH	206	T.C.	0.07	0.07	0.08	0.11	0.08	0.08
KDS	207	T.C.	0.20	0.70	0.07	0.26	0.18	0.28
GW	208	T.C.	0.35	0.29	0.22	0.80	1.57	0.64
PBU	209	T.C.	0.14	0.12	0.24	0.32	0.21	0.20
KRB	210	T.C.	1.04	0.72	0.71	0.53	0.58	0.71
Maximum permitted					5			2

All 50 individual exercise results were not greater than 5%.

Pass

All ten individual wearer arithmetic means were not greater than 2%.

Pass

Subjects ED, NRA and JLS were excluded from the test panel as they were unable to achieve a satisfactory fit.

Subject facial dimensions:

Subject	Face Length (mm)	Face Width (mm)	Face Depth (mm)	Mouth Width (mm)
INH	125	153	95	58
SAH	112	141	123	46
AH	119	113	115	50
PBU	116	141	90	52
KRB	108	130	108	49
KDS	102	128	98	49
GW	117	133	120	53
BH	120	139	108	54
RW	107	134	106	46
EM	122	142	127	51
ED	114	138	100	47
NRA	114	138	116	50
JLS	122	151	120	51



7.9.2 Penetration of filter material

Model: CDN-P3

Sodium chloride:

Pass

Specimen	Condition	Penetration (%)	
		After 3 minutes	Max. during exposure
111	A.R.	0.39	
112		0.14	
113		0.03	
120	S.W.	0.01	
121		0.03	
122		0.03	
126	M.S. + T.C.	0.04	0.04
127		0.04	0.04
128		0.02	0.02
Maximum permitted		1.0	

Paraffin oil:

Pass

Specimen	Condition	Penetration (%)	
		After 3 minutes	Max. during exposure
114	A.R.	0.05	
115		0.05	
116		0.06	
123	S.W.	0.06	
124		0.07	
125		0.06	
129	M.S. + T.C.	0.11	0.16
130		0.07	0.10
131		0.07	0.11
Maximum permitted		1.0	

7.10 Compatibility with skin**Model: CDN-P3**

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**Model: CDN-P3C**

No problems were encountered during practical performance testing.

Pass

No problems were encountered during total inward leakage testing.

Pass

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: CDN-P3C**

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

Pass**7.12 Carbon dioxide content of the Inhalation air****Model: CDN-P3C****Pass**

Specimen	CO ₂ (%)
235	0.60
236	0.62
237	0.66
Maximum permitted	1.0

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7.13 Head harness**Model: CDN-P3**

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 satisfied the total inward leakage requirements for the limited testing carried out. See 7.9.1 for results.

Ltd

Model: CDN-P3C

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

Pass

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

Pass

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

Pass

7.14 Field of vision**Model: CDN-P3C**

There were no adverse comments following practical performance tests.

Pass

7.15 Exhalation valve**Model: CDN-P3**

Assessment of function in all orientations was not requested.

NA

Assessment of the valve's protection was not requested.

NA

Assessment of the product against the leakage requirements of clause 7.9 was not requested.

NA

Assessment of the effect of high exhalation flow was not requested.

NA

The valve housing withstood 10 N applied for 10 s. Specimens 132 (A.R.), 133 (T.C.) and 134 (M.S.) were tested.

Pass

Model: CDN-P3C

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 cover.

Pass

The product satisfied leakage requirements. See 7.9 for results.

Pass

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

Pass

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

Pass

7.16 Breathing resistance**Model: CDN-P3C****Pass**

Specimen	Condition	Inhalation resistance (mbar)		Exhalation resistance (mbar)
		At 30 l/min	At 95 l/min	At 160 l/min
211	A.R.	0.58	2.05	2.53
212		0.52	1.97	2.47
213		0.55	2.01	2.48
217	T.C.	0.59	2.10	2.52
218		0.51	1.98	2.42
219		0.51	1.98	2.37
220	S.W.	0.62	2.21	2.64
221		0.59	2.21	2.69
222		0.61	2.13	2.69
238	A.R. + F.C.	0.56	1.99	2.48
239	T.C. + F.C.	0.55	2.21	2.42
240		0.54	2.05	2.38
Maximum permitted		1.0	3.0	3.0

7.18 Demountable parts**Model: CDN-P3C**

No demountable parts were used.

NAp

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Estimates of the uncertainty of measurement

Clause	Test	Uncertainty
7.4	Packaging	Not applicable
7.5	Material	See Note 1
7.6	Cleaning and disinfecting	Not applicable
7.7	Practical performance	See Note 1
7.8	Finish of parts	Not applicable
7.9.1	Total inward leakage	± 4.8%
7.9.2	Penetration of filter material - Sodium chloride	± 4.8%
7.9.2	Penetration of filter material - Paraffin oil	± 6.3%
7.10	Compatibility with skin	Not applicable
7.11	Flammability	See Note 1
7.12	CO ₂ content of the Inhalation air	± 8.0%
7.13	Head harness	Not applicable
7.14	Field of vision	See Note 1
7.15	Exhalation valve(s)	See Note 1
7.16	Breathing resistance	± 7.2%
7.17.2	Breathing resistance after clogging	± 10.6%
7.17.3	Filter penetration after clogging - Sodium chloride	± 4.8%
7.17.3	Filter penetration after clogging - Paraffin oil	± 6.3%
7.18	Demountable parts	Not applicable

Note 1 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.

Note 2 The uncertainty value is based on a standard uncertainty multiplied by a coverage factor $k = 2$, which provides for a confidence level of approximately 95%. Values expressed as a percentage (%) are relative.

Note 3 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)

END OF REPORT



Jiangyin Chang-hung Industrial Manufacturing Factory LLC
Model: CDN-P3 FFP3 NR filtering half mask



Jiangyin Chang-hung Industrial Manufacturing Factory LLC
model: CDN-P3C FFP3 NR filtering half mask

