

Test Report

EN 149 : 2001 + A1 : 2009

Particle filtering half masks

Report no: 1.14.11.51

Client: INSPEC Certification Services
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Salford
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M6 6AJ
United Kingdom

(on behalf of): JINHUA MEIXIN PROTECTIVE EQUIPMENT FACTORY

Client order: TA14/0109

Order(s) received: 27 October to 24 November 2014

Model(s): 2005
2005V
2006
2006V

Date(s) of tests: 30 October to 24 November 2014



Signed:

Peter Threlfall, Laboratory Supervisor

Issued: 27 November 2014

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Summary of assessment*

Clause		Assessment			
	Model:	2005	2005V	2006	2006V
7.4	Packaging	Ltd			Ltd
7.5	Material	Ltd	Ltd	Ltd	Ltd
7.6	Cleaning and disinfecting				
7.7	Practical performance	Ltd			Ltd
7.8	Finish of parts		Ltd		Ltd
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		Ltd
7.10	Compatibility with skin				
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				
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.
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	2005	2005V	2006	2006V
Classification claimed	FFP1 and FFP2 NR	FFP1 and FFP2 NR	FFP1 and FFP2 NR	FFP1 and FFP2 NR
Exhalation valve(s)	None	Single	None	Single

Submission details

Product	Quantity	Date received	INSPEC specimen no. (1B0568 +)
2005 filtering half mask	25	24 October 2014	104 to 160
2005V filtering half mask	45		211 to 260
2006 filtering half mask	25		311 to 360
2006V filtering half mask	45		401 to 460

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 (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 only of models 2005 and 2006V 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.

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 NR.

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

Result details**7.4 Packaging****Model: 2005**

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 that gave some protection against mechanical damage or contamination before use.

Pass**Model: 2006V**

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 that gave some protection against mechanical damage or contamination before use.

Pass**7.5 Material****Model: 2005**

The materials used were able to withstand handling and wear during the limited laboratory testing carried out.

Ltd

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 122 were conditioned in accordance with 8.3.1. None of the specimens conditioned suffered mechanical failure or collapse.

Pass

Specimens 106 to 108 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: 2005V**

The materials used were able to withstand handling and wear during the limited laboratory testing carried out.

Ltd

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 225 were conditioned in accordance with 8.3.1. None of the specimens conditioned suffered mechanical failure or collapse.

Pass

Specimens 226 to 231 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: 2006

The materials used were able to withstand handling and wear during the limited laboratory testing carried out.

Ltd

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

NAs

Specimens 320 to 322 were conditioned in accordance with 8.3.1. None of the specimens conditioned suffered mechanical failure or collapse.

Pass

Specimens 317 to 319 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: 2006V**

The materials used were able to withstand handling and wear during the limited laboratory testing carried out.

Ltd

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

NAs

Specimens 423 to 425 were conditioned in accordance with 8.3.1. None of the specimens conditioned suffered mechanical failure or collapse.

Pass

Specimens 406 to 410, 417 to 419, 429 to 431, 433, 439, 440, 446 and 447 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: 2005****Specimen and subject details:**

Specimen	Subject
148	KRB
149	-

Pass**NAs**

No adverse comments were made following testing.

Model: 2006V**Specimen and subject details:**

Specimen	Subject
448	AH
449	-

Pass**NAs**

The subject tied a knot in the bottom strap in order to achieve a fit.

No adverse comments were made following testing.

7.8 Finish of parts**Model: 2005V**

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

Ltd**Model: 2006V**

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: 2005**

Subject	Specimen	Cond	Walk	Head side/ side	Head up/down	Talk	Walk	Mean
BH	104	A.R.	0.47	0.47	0.71	0.55	0.37	0.51
DSW	151	A.R.	1.03	0.43	1.38	3.77	2.78	1.88
INH	106	T.C.	3.92	4.41	3.44	2.78	3.02	3.51
PBU	107	T.C.	0.76	0.69	0.79	0.90	0.49	0.73
JAD	108	T.C.	0.27	0.33	0.40	1.14	0.35	0.50
Maximum permitted (FFP1)			25					22
Maximum permitted (FFP2)			11					8

All 25 individual exercise results were not greater than 25% (FFP1).

Ltd

All 25 individual exercise results were not greater than 11% (FFP2).

Ltd

All 5 individual wearer arithmetic means were not greater than 22% (FFP1).

Ltd

All 5 individual wearer arithmetic means were not greater than 8% (FFP2).

Ltd

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

Model: 2006V

Subject	Specimen	Cond	Walk	Head side/ side	Head up/down	Talk	Walk	Mean
KDS	401	A.R.	6.84	7.32	9.44	5.71	5.69	7.00
BH	402	A.R.	1.73	2.65	1.15	1.47	2.38	1.88
INH	403	A.R.	5.64	5.64	7.81	5.39	6.95	6.28
ED	404	A.R.	3.69	4.90	4.27	2.13	3.16	3.63
DSW	451	A.R.	4.26	8.48	5.22	3.74	4.85	5.31
RAR	406	T.C.	4.27	6.05	5.35	4.32	4.37	4.87
GW	408	T.C.	2.71	1.84	2.57	4.51	2.68	2.86
KRB	409	T.C.	4.87	4.71	7.81	3.20	3.34	4.79
AH	410	T.C.	5.13	7.32	7.29	7.45	7.18	6.87
PT	456	T.C.	0.65	0.93	0.89	0.73	0.64	0.77
Maximum permitted (FFP1)			25					22
Maximum permitted (FFP2)			11					8

All 50 individual exercise results were not greater than 25% (FFP1).

Pass

All 50 individual exercise results were not greater than 11% (FFP2).

Pass

All 10 individual wearer arithmetic means were not greater than 22% (FFP1).

Pass

All 10 individual wearer arithmetic means were not greater than 8% (FFP2).

Pass

Subjects KDS, AH and DSW commented that the bottom strap was loose fitting.

Subjects SMT and VE 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)
BH	120	139	108	54
INH	125	153	95	58
PBU	116	141	90	52
JAD	113	136	120	54
KDS	102	128	98	49
ED	114	138	100	47
DSW	118	137	125	50
RAR	116	138	117	46
PT	118	139	120	54
GW	117	133	120	53
KRB	108	130	108	49
AH	119	113	115	50
SMT	117	131	115	40
VE	116	132	115	45
MLT	109	136	103	41

7.9.2 Penetration of filter material**Model: 2005V****Sodium chloride**

Specimen	Condition	Penetration (%)	
		After 3 minutes	Max. during exposure
211	A.R.	0.18	
212		0.12	
213		0.21	
220	S.W.	0.26	
221		0.18	
222		0.14	
226	M.S. + T.C.	0.45	0.45
227		0.52	0.52
228		0.39	0.39
Maximum permitted (FFP1)		20	
Maximum permitted (FFP2)		6.0	

Pass**Pass**

Paraffin oil:

Specimen	Condition	Penetration (%)	
		After 3 minutes	Max. during exposure
214	A.R.	0.85	
215		0.78	
216		0.81	
223	S.W.	0.49	
224		0.46	
225		0.43	
229	M.S. + T.C.	1.35	2.14
230		1.13	1.81
231		2.03	3.27
Maximum permitted (FFP1)		20	
Maximum permitted (FFP2)		6.0	

Pass**Pass****Model: 2006V****Paraffin oil**

Specimen	Condition	Penetration (%)	
		After 3 minutes	Max. during exposure
414	A.R.	Not requested	
415			
416			
423	S.W.	0.42	
424		0.42	
425		0.43	
429	M.S. + T.C.	1.07	1.81
430		1.13	1.92
431		1.13	1.92
Maximum permitted (FFP1)		20	
Maximum permitted (FFP2)		6.0	

NAs**NAs****NAs****Pass****Pass****Pass****Pass****Pass****Pass****7.11 Flammability****Model: 2006V**

Specimens 444 and 445 (A.R.) and 446 and 447 (T.C.) were tested. None of the specimens ignited.

Pass

7.12 Carbon dioxide content of the inhalation air**Model: 2006****Pass**

Specimen	CO ₂ (%)
335	0.59
336	0.64
337	0.66
Maximum permitted	1.0

7.13 Head harness**Model: 2005**

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: 2006V**

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

Ltd

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

Ltd

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

Pass**7.14 Field of vision****Model: 2005**

There were no adverse comments following limited practical performance tests.

Ltd**Model: 2006V**

There were no adverse comments following limited practical performance tests.

Ltd

7.15 Exhalation valve**Model: 2006V**

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 satisfied leakage requirements for the limited testing carried out. See 7.9 for results.

Ltd

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 432 (A.R.), 433 (T.C.) and 434 (M.S.) were tested.

Pass**7.16 Breathing resistance****Model: 2006****Ltd**

Specimen	Condition	Inhalation resistance (mbar)		Exhalation resistance (mbar)
		At 30 l/min	At 95 l/min	At 160 l/min
311	A.R.	Not requested		2.67
312				2.64
313				2.52
317	T.C.	Not requested		2.61
318				2.45
319				2.48
320	S.W.	Not requested		2.59
321				2.57
322				2.86
Maximum permitted (FFP1)				3.0
Maximum permitted (FFP2)				3.0

Model: 2006V

Specimen	Condition	Inhalation resistance (mbar)		Exhalation resistance (mbar)
		At 30 l/min	At 95 l/min	At 160 l/min
411	A.R.	0.55	1.74	1.80
412		0.55	1.76	1.78
413		0.59	1.83	1.81
417	T.C.	0.44	1.44	1.67
418		0.44	1.48	1.68
419		0.46	1.47	1.53
423	S.W.	0.53	1.76	1.72
424		0.50	1.63	1.84
425		0.46	1.49	1.74
438	A.R. + F.C.	0.53	1.76	1.85
439	T.C. + F.C.	0.51	1.66	1.81
440		0.49	1.56	1.73
Maximum permitted (FFP1)		0.6	2.1	3.0
Maximum permitted (FFP2)		0.7	2.4	3.0

Pass**Pass****7.18 Demountable parts****Model: 2006V**

No demountable parts were used.

NAP

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	$\pm 4.7\%$
7.9.2	Penetration of filter material - Sodium chloride	$\pm 4.8\%$
7.9.2	Penetration of filter material - Paraffin oil	$\pm 4.2\%$
7.10	Compatibility with skin	Not applicable
7.11	Flammability	See Note 1
7.12	CO ₂ content of the inhalation air	$\pm 4.0\%$
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	$\pm 2.1\%$
7.17.2	Breathing resistance after clogging	$\pm 3.9\%$
7.17.3	Filter penetration after clogging - Sodium chloride	$\pm 4.7\%$
7.17.3	Filter penetration after clogging - Paraffin oil	$\pm 4.1\%$
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.

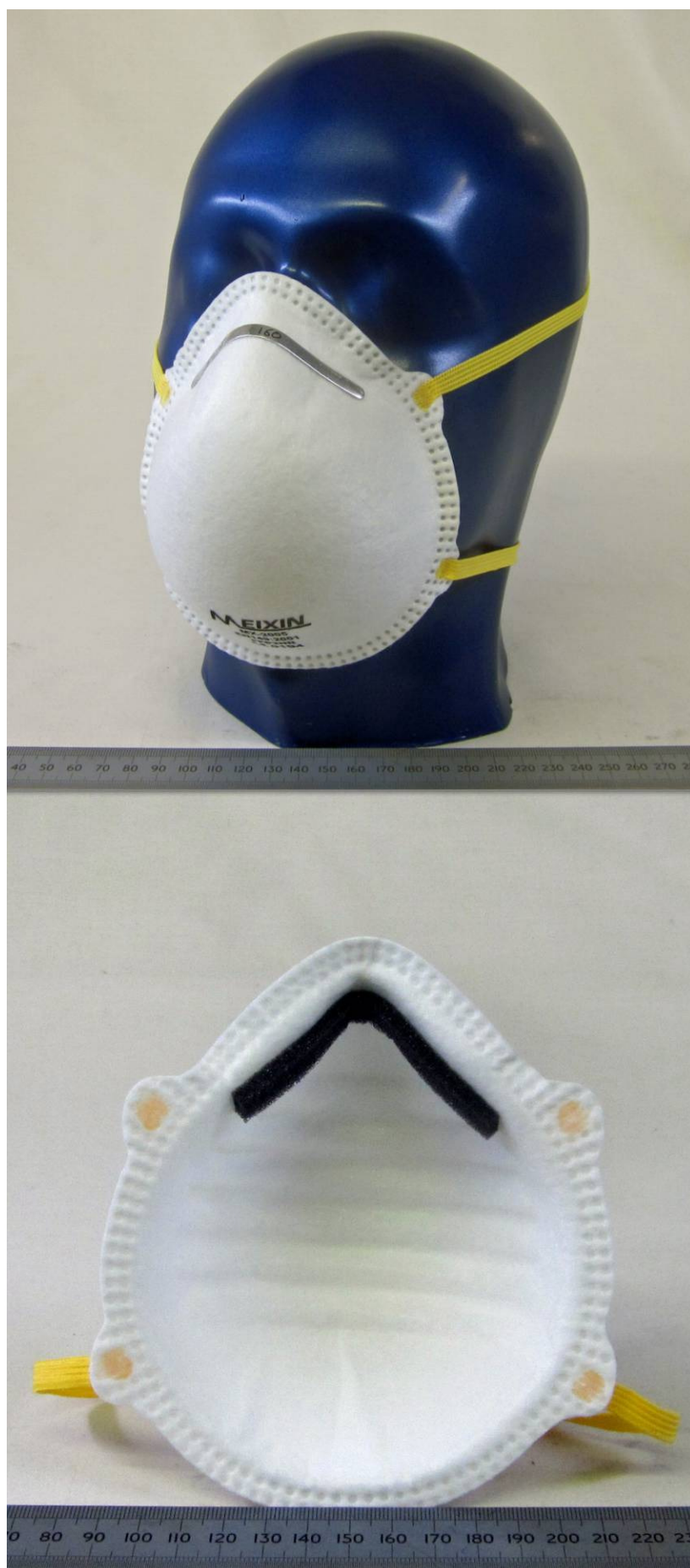
It should be noted that the above values have not been taken into account when making assessment to the pass/fail criteria.

ANNEX

This Annex comprises one section.

1. Photographs of the products tested. (4 pages)

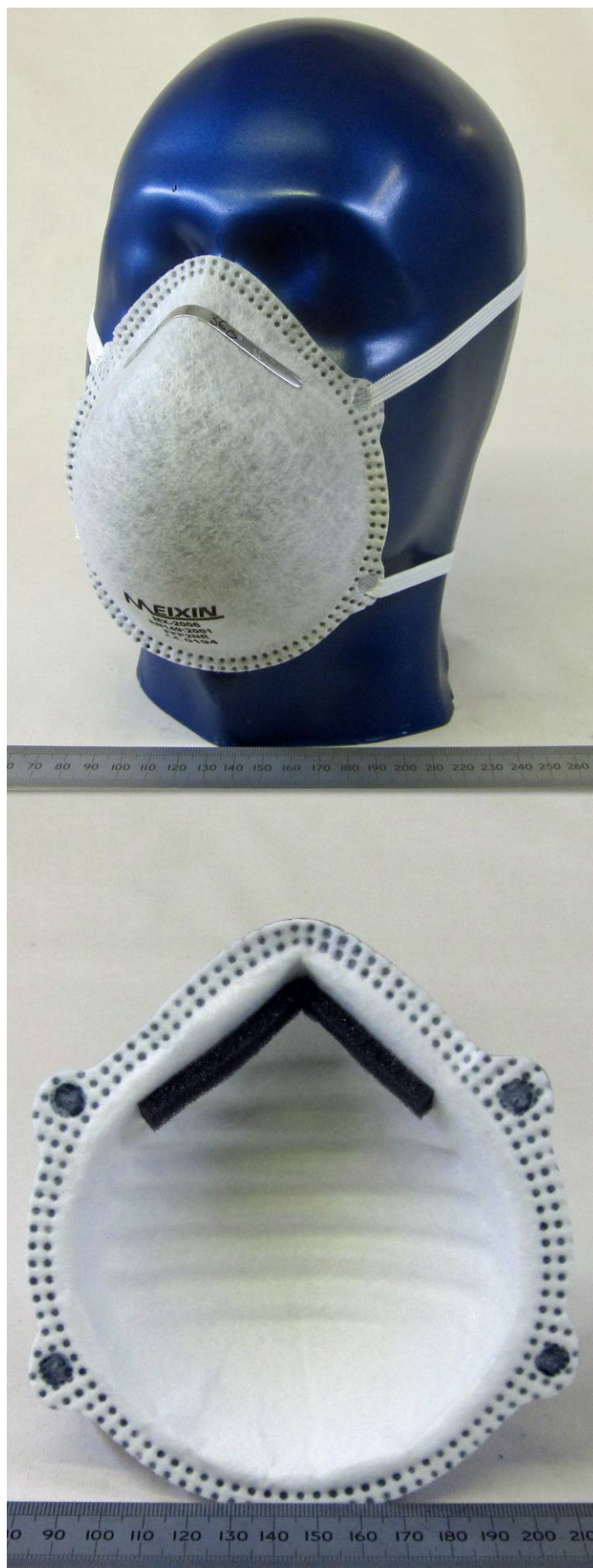
Jinhua Meixin Protective Equipment Factory's Model 2005 filtering half mask



Jinhua Meixin Protective Equipment Factory's Model 2005V filtering half mask



Jinhua Meixin Protective Equipment Factory's Model 2006 filtering half mask



Jinhua Meixin Protective Equipment Factory's Model 2006V filtering half mask

