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## TEST REPORT:

### Particulate respirator-half facepiece

EN 149: 2001 +A1: 2009 Respiratory protective devices — Filtering half masks to protect against particles —  
Requirements, testing, marking

Report No: 2014-W-191

Client: Polygard (Zhangzhou) PPE CO., Ltd.

Contact: Ye Xiaolin

Model (s): 8200

Date(s) of tests: 2014.9.20-2014.10.31

## DESCRIPTION OF SAMPLES

General Information	Model	Main Components
Manufacturer	8200	Cup-shaped respirator body
Manufacturer Address	Polygard (Zhangzhou) PPE CO., Ltd.	
	Inner Dashijie Logistics Center, Pinghe County, Zhangzhou City, Fujian Province, China.	

Signed:

Issued: 2014.11.5

杨文芬 Yang Wenfen

Authorized Signatory, Lab Director

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国家劳动防护用品质量监督检验中心(北京)



Test Results

7.3 Visual inspection Pass<sup>1</sup>

The visual inspection shall include the marking and information supplied by the manufacturer.

**Note1: The visual inspection was carried out as per required by the standard.**

7.4 Package Pass

Particle filtering half masks shall be offered for sale packaged in such a way that they are protected against mechanical damage and contamination before use.

7.5 Material Pass<sup>2</sup>

Materials used shall be suitable to withstand handling and wear over the period for which the particle filtering half mask is designed to be used.

Any material from the filter media released by the air flow through the filter shall not constitute a hazard or nuisance for the wearer.

After undergoing the conditioning described in 8.3.1 none of the particle filtering half masks shall have suffered mechanical failure of the facepiece or straps.

When conditioned in accordance with 8.3.1 and 8.3.2 the particle filtering half mask shall not collapse.

**Note2: Refer to Annex A for test data.**

7.6 Cleaning and disinfecting N/A<sup>3</sup>

If the particle filtering half mask is designed to be re-usable, the materials used shall withstand the cleaning and disinfecting agents and procedures to be specified by the manufacturer.

**Note3: Non-reusable respirator.**

7.7 Practical performance Pass<sup>4</sup>

The particle filtering half mask shall undergo practical performance tests under realistic conditions.

**Note4: Refer to Annex A for test data.**

7.8 Finish of parts Pass

Parts of the device likely to come into contact with the wearer shall have no sharp edges or burrs.

7.9.1 Total inward leakage Pass<sup>5</sup>

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

**Note5: Refer to Annex A for test data.**

7.9.2 Penetration of filter material Pass<sup>6</sup>

The penetration of the filter of the particle filtering half mask shall meet the requirements of Table 1.

	Sodium chloride test 95 l/min	Paraffin oil test 95 l/min
FFP1	≤20%	≤20%
FFP2	≤6%	≤6%
FFP3	≤1%	≤1%

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**Note6: Refer to Annex A for test data.**

#### 7.10 Compatibility with skin

**Pass<sup>7</sup>**

Materials that may come into contact with the wearer's skin shall not be known to be likely to cause irritation or any other adverse effect to health.

**Note7: Refer to Annex A for test data.**

#### 7.11 Flammability

**Pass<sup>8</sup>**

When tested, the particle filtering half mask shall not burn or not to continue to burn for more than 5 s after removal from the flame.

**Note8: Refer to Annex A for test data.**

#### 7.12 Carbon dioxide content of the inhalation air

**Pass<sup>9</sup>**

The carbon dioxide content of the inhalation air (dead space) shall not exceed an average of 1,0 % (by volume)

**Note9: Refer to Annex A for test data.**

#### 7.13 Head harness

**Pass<sup>10</sup>**

The head harness shall be designed so that the particle filtering half mask can be donned and removed easily.

The head harness shall be adjustable or self-adjusting and shall be sufficiently robust to hold the particle filtering half mask firmly in position and be capable of maintaining total inward leakage requirements for the device.

**Note10: Refer to Annex A for test data.**

#### 7.14 Field of vision

**Pass<sup>11</sup>**

The field of vision is acceptable if determined so in practical performance tests.

**Note11: Refer to Annex A for test data.**

#### 7.15 Exhalation valve

**N/A<sup>12</sup>**

A particle filtering half mask may have one or more exhalation valve(s), which shall function correctly in all orientations.

If an exhalation valve is provided it shall be protected against or be resistant to dirt and mechanical damage and may be shrouded or may include any other device that may be necessary for the particle filtering half mask to comply with 7.9.

Exhalation valve(s), if fitted, shall continue to operate correctly after a continuous exhalation flow of 300 l/min over a period of 30 s.

When the exhalation valve housing is attached to the faceblank, it shall withstand axially a tensile force of 10 N applied for 10 s.

**Note12: Valve-less respirator.**

#### 7.16 Breathing resistance

**Pass<sup>13</sup>**

Classification	Maximum permitted resistance (mbar)		
	Inhalation		Exhalation
	30 l/min	95 l/min	160 l/min
FFP1	0.6	2.1	3.0
FFP2	0.7	2.4	3.0
FFP3	1.0	3.0	3.0

**Note13: Refer to Annex A for test data.**

**7.17 Clogging****N/A<sup>14</sup>****7.17.2 Breathing resistance****Pass**

Valved particle filtering half masks:

After clogging the inhalation resistances shall not exceed:

FFP1: 4 mbar, FFP2: 5 mbar, FFP3: 7 mbar at 95L/min continuous flow

The exhalation resistance shall not exceed 3 mbar at 160 L/min continuous flow

Valveless particle filtering half masks

After clogging the inhalation and exhalation resistances shall not exceed:

FFP1: 3 mbar, FFP2: 4 mbar, FFP3: 5 mbar at 95L/min continuous flow

**7.17.3 Penetration of filter material****Pass**

Sodium chloride test 95 l/min

Paraffin oil test 95 l/min

FFP1  $\leq 20\%$

$\leq 20\%$

FFP2  $\leq 6\%$

$\leq 6\%$

FFP3  $\leq 1\%$

$\leq 1\%$

**Note14: Non-reusable respirator.**

**7.18 Demountable parts****N/A<sup>15</sup>**

All demountable parts (if fitted) shall be readily connected and secured, where possible by hand

**Note15: No demountable parts.**

**9 Marking****Pass****9.1 Packaging**

The following information shall be clearly and durably marked on the smallest commercially available packaging or legible through it if the packaging is transparent.

**9.1.1** The name, trademark or other means of identification of the manufacturer or supplier.

**9.1.2** Type-identifying marking.

**9.1.3** Classification

The appropriate class (FFP1, FFP2 or FFP3) followed by a single space and then: "NR" if the particle filtering half mask is limited to single shift use only. Example: FFP3 NR, or "R" if the particle filtering half mask is re-usable. Example: FFP2 R D.

**9.1.4** The number and year of publication of this European Standard.

**9.1.5** At least the year of end of shelf life. The end of shelf life may be informed by a pictogram as shown in Figure 12a, where yyyy/mm indicates the year and month.

**9.1.6** The sentence 'see information supplied by the manufacturer', at least in the official language(s) of the country of destination, or by using the pictogram as shown in Figure 12b.

**9.1.7** The manufacturer's recommended conditions of storage (at least the temperature and humidity) or equivalent pictogram, as shown in Figures 12c and 12d.

**9.1.8** The packaging of those particle filtering half masks passing the dolomite clogging test shall be additionally marked with the letter "D". This letter shall follow the classification marking preceded by a single space.

**9.2 Particle filtering half mask**

Particle filtering half masks complying with this European Standard shall be clearly and durably marked with the following:

**9.2.1** The name, trademark or other means of identification of the manufacturer or supplier.

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**9.2.2** Type-identifying marking.

**9.2.3** The number and year of publication of this European Standard.

**9.2.4** Classification

The appropriate class (FFP1, FFP2 or FFP3) followed by a single space and then: "NR" if the particle filtering half mask is limited to single shift use only. Example: FFP3 NR, or "R" if the particle filtering half mask is re-usable. Example: FFP2 R D.

**9.2.5** If appropriate the letter D (dolomite) in accordance with clogging performance. This letter shall follow the classification marking preceded by a single space

**9.2.6** Sub-assemblies and components with considerable bearing on safety shall be marked so that they can be identified.

## **10 Information to be supplied by the manufacturer**

**Pass**

**10.1** Information supplied by the manufacturer shall accompany every smallest commercial available package.

**10.2** Information supplied by the manufacturer shall be at least in the official language(s) of the country of destination.

**10.3** The information supplied by the manufacturer shall contain all information necessary for trained and qualified persons on

application/limitations;

the meaning of any colour coding;

checks prior to use;

donning, fitting;

use;

maintenance (e.g. cleaning, disinfecting), if applicable;

storage;

the meaning of any symbols/pictograms used

**10.4** The information shall be clear and comprehensible. If helpful, illustrations, part numbers, marking shall be added.

**10.5** Warning shall be given against problems likely to be encountered, for example:

fit of particle filtering half mask (check prior to use);

it is unlikely that the requirements for leakage will be achieved if facial hair passes under the face seal;

air quality (contaminants, oxygen deficiency);

use of equipment in explosive atmosphere.

**10.6** The information shall provide recommendations as to when the particle filtering half mask shall be discarded.

**10.7** For devices marked "NR", a warning shall be given that the particle filtering half mask shall not be used for more than one shift.

## **End of Test Results**

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**Annex A: Summarization of Test Data**

Clause		Result			Assessment
7.5	Material	Simulated wearing treatment	1#	No mechanical failure	Pass
			2#	No mechanical failure	
			3#	No mechanical failure	
		Temperature conditioned	4#	No mechanical failure	
			5#	No mechanical failure	
			6#	No mechanical failure	
7.9	Practical performance	1#		No mechanical defect	Pass
		2#		No mechanical defect	
7.9.1	Total inward leakage	Individual exercise result			Pass
		As received	9#	47 out of the 50 individual exercise results $\leq 11\%$	
			10#	48 out of the 50 individual exercise results $\leq 11\%$	
			11#	47 out of the 50 individual exercise results $\leq 11\%$	
			12#	47 out of the 50 individual exercise results $\leq 11\%$	
			13#	47 out of the 50 individual exercise results $\leq 11\%$	
		Temperature conditioned	14#	48 out of the 50 individual exercise results $\leq 11\%$	
			15#	46 out of the 50 individual exercise results $\leq 11\%$	
			16#	46 out of the 50 individual exercise results $\leq 11\%$	
			17#	47 out of the 50 individual exercise results $\leq 11\%$	
			18#	47 out of the 50 individual exercise results $\leq 11\%$	
		Individual wearer arithmetic means			
		As received	9#	9 individual wearer arithmetic means $\leq 8\%$	
			10#	9 individual wearer arithmetic means $\leq 8\%$	
			11#	9 individual wearer arithmetic means $\leq 8\%$	
			12#	9 individual wearer arithmetic means $\leq 8\%$	
			13#	8 individual wearer arithmetic means $\leq 8\%$	
		Temperature conditioned	14#	8 individual wearer arithmetic means $\leq 8\%$	
			15#	8 individual wearer arithmetic means $\leq 8\%$	
			16#	9 individual wearer arithmetic means $\leq 8\%$	
			17#	9 individual wearer arithmetic means $\leq 8\%$	
			18#	8 individual wearer arithmetic means $\leq 8\%$	
7.9.2	Penetration of filter material	Sodium chloride test(95L/min)			Pass
		As received	19#	1.27%	
			20#	1.42%	
			21#	1.51%	
		Simulated wearing treatment	19#	1.49%	
			20#	1.51%	
			21#	1.19%	
		M.S+T.C	25#	1.49%	
			26#	1.51%	
			27#	1.62%	
		Paraffin oil test(95L/min)			
		As received	28#	1.81%	
			29#	1.92%	
			30#	1.87%	
		Simulated wearing treatment	31#	1.72%	
			32#	1.69%	
			33#	1.79%	
		M.S+T.C	34#	1.91%	
			35#	1.82%	
			36#	1.79%	

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Clause			Result				Assessment
7.10	Compatibility with skin	As received	9#	No irritation or any other adverse effect to health			Pass
			10#	No irritation or any other adverse effect to health			
			11#	No irritation or any other adverse effect to health			
			12#	No irritation or any other adverse effect to health			
			13#	No irritation or any other adverse effect to health			
		Temperature conditioned	14#	No irritation or any other adverse effect to health			
			15#	No irritation or any other adverse effect to health			
			16#	No irritation or any other adverse effect to health			
			17#	No irritation or any other adverse effect to health			
			18#	No irritation or any other adverse effect to health			
7.11	Flammability	As received	37#	Didn't burn			Pass
			38#	Didn't burn			
		Temperature conditioned	39#	Didn't burn			
			40#	Didn't burn			
7.12	Carbon dioxide content of the inhalation air	As received					Pass
		1#	2#	3#	Mean value		
		0.4%	0.5%	0.4%	0.4%		
7.13	Head harness	As received					Pass
		9#	Head harness can be donned and removed easily, adjustable and have sufficiently robust to hold the particle filtering half mask firmly.				
		10#	Head harness can be donned and removed easily, adjustable and have sufficiently robust to hold the particle filtering half mask firmly.				
		11#	Head harness can be donned and removed easily, adjustable and have sufficiently robust to hold the particle filtering half mask firmly.				
		12#	Head harness can be donned and removed easily, adjustable and have sufficiently robust to hold the particle filtering half mask firmly.				
		13#	Head harness can be donned and removed easily, adjustable and have sufficiently robust to hold the particle filtering half mask firmly.				
		Temperature conditioned					
		14#	Head harness can be donned and removed easily, adjustable and have sufficiently robust to hold the particle filtering half mask firmly.				
		15#	Head harness can be donned and removed easily, adjustable and have sufficiently robust to hold the particle filtering half mask firmly.				
		16#	Head harness can be donned and removed easily, adjustable and have sufficiently robust to hold the particle filtering half mask firmly.				
		17#	Head harness can be donned and removed easily, adjustable and have sufficiently robust to hold the particle filtering half mask firmly.				
		18#	Head harness can be donned and removed easily, adjustable and have sufficiently robust to hold the particle filtering half mask firmly.				
7.14	Field of vision	1#	Passed the practical performance tests				Pass
		2#	Passed the practical performance tests				

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Clause		Result				Assessment	
7.16	Breathing resistance			Inhalation		Exhalation	Pass
				30L/min	95L/min	160L/min	
		As received					
		1#	A	0.3mbar	1.2mbar	0.6mbar	
			B	0.3mbar	1.2mbar	0.6mbar	
			C	0.3mbar	1.3mbar	0.7mbar	
			D	0.2mbar	1.3mbar	0.6mbar	
			E	0.3mbar	1.2mbar	0.6mbar	
		2#	A	0.3mbar	1.2mbar	0.6mbar	
			B	0.3mbar	1.2mbar	0.7mbar	
			C	0.4mbar	1.3mbar	0.6mbar	
			D	0.4mbar	1.3mbar	0.6mbar	
			E	0.3mbar	1.3mbar	0.6mbar	
		41#	A	0.3mbar	1.2mbar	0.6mbar	
			B	0.3mbar	1.2mbar	0.6mbar	
			C	0.3mbar	1.2mbar	0.6mbar	
			D	0.3mbar	1.2mbar	0.6mbar	
			E	0.3mbar	1.2mbar	0.6mbar	
		Simulated wearing treatment					
		42#	A	0.4mbar	1.2mbar	1.3mbar	
			B	0.4mbar	1.2mbar	1.3mbar	
			C	0.4mbar	1.2mbar	1.3mbar	
			D	0.3mbar	1.2mbar	1.3mbar	
			E	0.4mbar	1.3mbar	1.3mbar	
		43#	A	0.4mbar	1.2mbar	1.2mbar	
			B	0.4mbar	1.2mbar	1.2mbar	
			C	0.4mbar	1.3mbar	1.2mbar	
			D	0.4mbar	1.2mbar	1.2mbar	
			E	0.3mbar	1.2mbar	1.3mbar	
		44#	A	0.4mbar	1.2mbar	1.3mbar	
			B	0.4mbar	1.2mbar	1.3mbar	
			C	0.4mbar	1.3mbar	1.3mbar	
			D	0.3mbar	1.2mbar	1.3mbar	
			E	0.3mbar	1.2mbar	1.3mbar	

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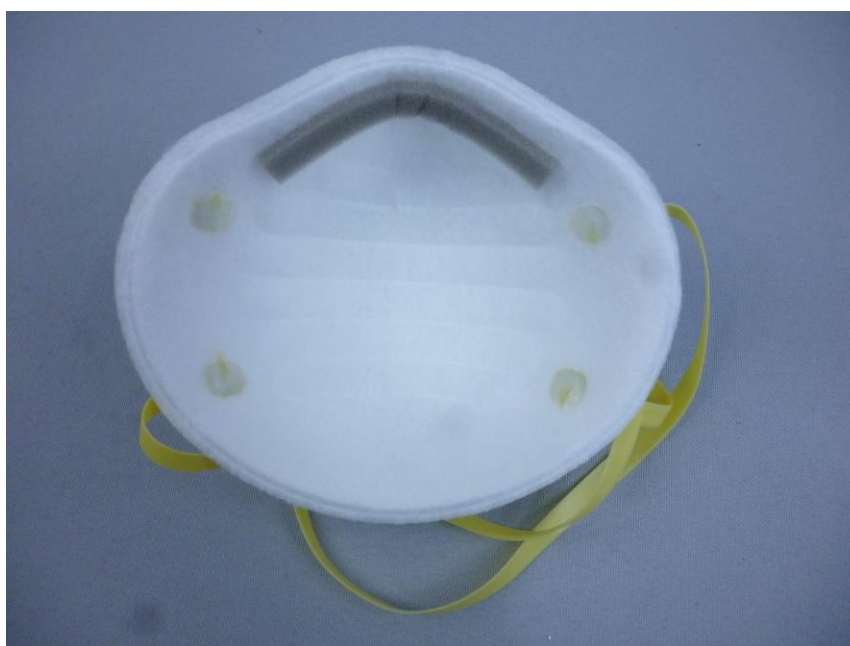


Clause		Result				Assessment	
7.16	Breathing resistance			Inhalation	Exhalation		Pass
				30L/min	95L/min	160L/min	
		Temperature conditioned					
		45#	A	0.3mbar	1.2mbar	1.3mbar	
			B	0.3mbar	1.1mbar	1.3mbar	
			C	0.3mbar	1.2mbar	1.3mbar	
			D	0.3mbar	1.3mbar	1.3mbar	
			E	0.3mbar	1.2mbar	1.3mbar	
		46#	A	0.3mbar	1.2mbar	1.3mbar	
			B	0.3mbar	1.2mbar	1.3mbar	
			C	0.3mbar	1.2mbar	1.3mbar	
			D	0.3mbar	1.2mbar	1.3mbar	
			E	0.3mbar	1.2mbar	1.3mbar	
		47#	A	0.3mbar	1.2mbar	1.2mbar	
			B	0.3mbar	1.3mbar	1.3mbar	
			C	0.3mbar	1.3mbar	1.3mbar	
			D	0.3mbar	1.3mbar	1.3mbar	
			E	0.3mbar	1.2mbar	1.3mbar	
		Flow conditioned					
		48#	A	0.3mbar	1.2mbar	1.3mbar	
			B	0.3mbar	1.2mbar	1.3mbar	
			C	0.3mbar	1.2mbar	1.3mbar	
			D	0.3mbar	1.2mbar	1.3mbar	
			E	0.3mbar	1.2mbar	1.3mbar	
		49#	A	0.4mbar	1.2mbar	1.3mbar	
			B	0.4mbar	1.3mbar	1.3mbar	
			C	0.3mbar	1.3mbar	1.3mbar	
			D	0.3mbar	1.3mbar	1.3mbar	
			E	0.3mbar	1.3mbar	1.2mbar	
		50#	A	0.3mbar	1.3mbar	1.3mbar	
			B	0.3mbar	1.2mbar	1.3mbar	
			C	0.3mbar	1.2mbar	1.3mbar	
			D	0.3mbar	1.2mbar	1.3mbar	
			E	0.3mbar	1.3mbar	1.3mbar	
		A: facing directly ahead B: facing vertically upwards C: facing vertically downwards D: lying on the left side E: lying on the right side					

### End of Annex A

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## ANNEX B PHOTOS OF SAMPLES



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**End of Annex B**

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