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PERSONAL PROTECTIVE EQUIPMENT EU TYPE-EXAMINATION TEST REPORT

EN 149:2001+A1:2009
Particle filtering half mask

The examination and testing of Personal Protective Equipment were carried out in accordance with
MSZ EN ISO/IEC 17025:2005 standard
by GÉPTESZT Kft. Notified Body, identified under number 2233 in the EU

Customer:	QCS automotive s.r.o. Address: Námestí Svaté Trojice 257, Opava, 74601, CZECH REPUBLIC
Model:	Czech Royal Protection Respirator FFP2 Model# 20-01
Classification:	FFP2 NR
Exhalation valve:	NO
Inhalation valve:	NO
Uses:	non reusable
Project number:	GT284
Test report number:	VD35/284/2104/E/2233
Project worksheet number:	VD-34-2021-284
Date of the test:	2021.03.11-03.25.
Samples received date:	2021.03.10.
Sample numbers:	284-1 - 284-46
Attachment:	no

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Budai Dániel
Director of Laboratory



Relevant standards, directives and requirements:

EN 149:2001+A1:2009 Filtering half masks to protect against particles

Description of the sample

The foldable mask is sold in white colour and consists of 5 layers:

Layer 1: Spunbond 40g

Layer 2: Meltblown 25 g

Layer 3: Hot Air Cotton

Layer 4: Meltblown 25 g

Layer 5: Spunbond 20g

The nose clip is made of aluminium+PE. The earloop is made of elastic cord.



**Short description of EU-type tests:**

Requirement	Test method	Description	Result
7.4	8.2	Packaging	Passed
7.5	8.2	Material	Passed
7.6	8.11	Cleaning and disinfecting	NA
7.7	8.4	Practical performance	Passed
7.8	8.2	Finish of parts	Passed
7.9.1	8.5	Total inward leakage	Passed
7.9.2	8.11	Penetration of filter material: NaCl	Passed
7.9.2	8.11	Penetration of filter material: paraffin oil	Passed
7.10	8.4 and 8.5	Compatibility with skin	Passed
7.11	8.6	Flammability	Passed
7.12	8.7	Carbon dioxide content of the inhalation air	Passed
7.13	8.4 and 8.5	Head harness	Passed
7.14	8.4	Field of vision	Passed
7.15	8.2, 8.3.4, 8.8	Exhalation valve(s)	NA
7.16	8.9	Breathing resistance	Passed
7.17	8.10	Clogging	NA
7.18	8.2	Demountable parts	NA
9	-	Marking	Passed
10	-	Information to be supplied by the manufacturer	Passed

Analysis and details of EU-type test results:**7.4 Packaging**

5/10/20 pieces of masks are packed in a varnished hardened paper.

The packaging gives enough protection against mechanical damage or contamination.

PASSED

7.5 Material

- conditioning S.W.: Sample nr: 284-16 to 284-18
None of the particle filtering half masks have suffered mechanical failure of the facepiece or straps.
- conditioning T.C.: Sample nr.: 284-41 to 284-43
Particle filtering half masks did not collapse.

PASSED

7.6 Cleaning and disinfecting (only for reusable masks)

Because the mask is non-reusable, this test was not carried out.

NA

7.7 Practical performance

The particle filtering half masks are tested by practical performance tests under realistic conditions.

1. Walking test for 10 min
2. Work simulation tests:
 - walking on the level with headroom of $(1,3 \pm 0,2)$ m for 5 min;
 - crawling on the level with headroom of $(0,70 \pm 0,05)$ m for 5 min;
 - filling a small basket 20x in 10 min;

Subjects	Samples	Conditioning	Result
GL	284-1	A.R.	PASSED
MZS	284-2	A.R.	PASSED

There were not any imperfections related to the wearer's acceptance.

PASSED



7.8 Finish of parts

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

PASSED

7.9.1 Total inward leakage

With sodium chloride aerosol. The masks were in good condition.

Number of subjects were replaced, because of not fitting/facial dimensions:0.....

Subjects facial dimensions				
Subject	Face length, mm	Face width, mm	Face depth, mm	Mouth width, mm
GL	90	85	80	50
NT	122	134	142	57
SA	110	120	120	50
VB	100	110	80	75
BL	110	140	130	50
NA	130	120	130	50
MD	117	120	108	60
DF	108	136	105	55
BD	120	130	135	55
RE	115	138	112	48

Subject	Sample	Cond.	Total inward leakage, %					Mean, %
			Walk	Head left/right	Head up/down	Talk	Walk	
GL	284-3	A.R.	3,42	4,05	3,36	4,35	3,97	3,83
NT	284-4	A.R.	3,91	3,41	3,89	3,81	4,56	3,92
SA	284-5	A.R.	4,31	4,08	3,36	2,34	3,74	3,57
VB	284-6	A.R.	3,52	3,37	3,47	1,20	3,13	2,94
BL	284-7	A.R.	3,61	3,42	3,79	6,01	3,80	4,13
NA	284-8	T.C.	2,48	3,38	3,64	4,94	3,15	3,52
MD	284-9	T.C.	3,45	4,33	3,86	2,53	4,23	3,68
DF	284-10	T.C.	2,30	2,97	2,79	2,06	3,41	2,71
BD	284-11	T.C.	0,77	1,02	1,00	0,60	0,97	0,87
RE	284-12	T.C.	2,46	2,19	2,51	3,70	2,38	2,65

50 out of the 50 individual exercise results for total inward leakage were not greater than 11 % and
10 out of the 10 individual wearer arithmetic means for the total inward leakage were not greater than 8%.

PASSED

7.9.2 Penetration of filter material: NaCl

NaCl aerosol: concentration: 4-12 mg/m³, flow: 95 l/min

Sample	Conditioning	Penetration, %	Exposure, %
284-13	A.R.	0,38	NA
284-14	A.R.	0,37	NA
284-15	A.R.	0,38	NA
284-16	S.W.	0,38	NA
284-17	S.W.	0,36	NA
284-18	S.W.	0,39	NA
284-19	M.S→T.C.	NA	0,40
284-20	M.S→T.C.	NA	0,38
284-21	M.S→T.C.	NA	0,44
Maximum permitted:		6 %	

The penetration of the filter material did not exceed the maximum permitted 6 % in case of any masks.

PASSED



7.9.2 Penetration of filter material: paraffin oil

Paraffin aerosol: concentration: 15-25 mg/m³, flow: 95 l/min

Sample	Conditioning	Penetration, %	Exposure, %
284-22	A.R.	0,60	NA
284-23	A.R.	0,52	NA
284-24	A.R.	0,48	NA
284-25	S.W.	0,57	NA
284-26	S.W.	0,54	NA
284-27	S.W.	0,57	NA
284-28	M.S→T.C.	NA	0,60
284-29	M.S→T.C.	NA	0,58
284-30	M.S→T.C.	NA	0,57
Maximum permitted:		6 %	

The penetration of the filter material did not exceed the maximum permitted 6 % in case of any masks.

PASSED

7.10 Compatibility with skin

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

During the Practical performance test there were no problems.

During the Total inward leakage test there were no problems.

PASSED

7.11 Flammability

Sample	Conditioning
284-33	T.C.
284-34	T.C.
284-31	A.R.
284-32	A.R.

The materials used do not present a danger for the wearer and are not of highly flammable nature. The samples did not burn.

PASSED

7.12 Carbon dioxide content of the inhalation air

Air supplied from breathing machine: 25 cycles/min and 2,0 l/stroke, carbon dioxide content of exhaled air 5 V/V%, air flow 0,5 m/s.

Ambient carbon dioxide level: 0,08 % (less than 0,1 %.)

Sample	CO ₂ , V/V%
284-35	0,48
284-36	0,48
284-37	0,52
Average	0,49

The carbon dioxide content of the inhalation air (dead space) did not exceed an average of 1,0 V/V %.

PASSED

7.13 Head harness

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 part 7.9.1. for results.

PASSED

**7.14 Field of vision**

Sample
284-1
284-2

During the practical performance test the field of vision was not affected adversely by wearing mask.

PASSED

7.15 Exhalation valve(s)

NA

7.16 Breathing resistance

Sample	Conditioning	Inhalation resistance		Exhalation resistance 160 l/min				
		30 l/min	95 l/min	ahead	vert.upwards	vert downwards	left	right
284-38	A.R.	0,52	1,84	2,94	2,95	2,94	2,93	2,94
284-39	A.R.	0,52	1,82	2,93	2,93	2,92	2,92	2,92
284-40	A.R.	0,55	1,87	2,95	2,95	2,94	2,95	2,95
284-41	T.C.	0,52	1,74	2,83	2,84	2,83	2,83	2,82
284-42	T.C.	0,51	1,76	2,80	2,81	2,81	2,80	2,81
284-43	T.C.	0,53	1,77	2,81	2,82	2,80	2,81	2,80
284-44	S.W.	0,53	1,91	2,87	2,88	2,87	2,88	2,87
284-45	S.W.	0,55	1,96	2,90	2,90	2,90	2,89	2,90
284-46	S.W.	0,54	1,93	2,88	2,89	2,88	2,87	2,87
Maximum permitted		0,7	2,4	3,0				

None of the measured values exceeded the maximum values.

PASSED

7.17 Clogging

The optional dolomit clogging test was not required by manufacturer.

NA

7.18 Demountable parts

The device does not contain demountable parts.

NA

9. Marking

The marking information is complete and clearly and durably marked on the packaging.

The marking information is complete and clearly and durably marked on the particle filtering half mask.

PASSED

10. Information to be supplied by the manufacturer

Information to be supplied by the manufacturer accompany every smallest commercial available package and contain all information necessary for trained and qualified persons.

PASSED

Result of EU-type test:

The above described **Czech Royal Protection Respirator FFP2 Model# 20-01 particle filtering half mask** at the time of the test **conformed** to the test requirements of EN 149:2001+A1:2009 class FFP2 NR at the close date of test report.