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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 17025:2018** standard
by GÉPTESZT Kft. Notified Body, identified under number 2233 in the EU

Customer:	**PPE Germany GmbH** Address: Karlsruher Str. 18, 10711 Berlin, Germany
Model:	**DODO**
Classification:	**FFP2 NR**
Exhalation valve:	**no**
Inhalation valve:	**no**
Uses:	**non reusable (NR)**
Project number:	**GT409**
Test report number:	**VD35/409/2111/E/2233**
Project worksheet number:	**VD-34-2021-409**
Date of the test:	**2021.10.13. – 2021.11.02.**
Samples received date:	**2021.10.12.**
Sample numbers:	**409-1 – 409-46**
Attachment:	**no**

GÉPTESZT KFT.
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Issued: **Budapest, 2021.11.06.**

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 contains these components:

	Item description	Material	Specification
Layer 1	Outer layer 1	Spunbond 40gsm ±6%	Polypropylene
Layer 2	Filter layer 2	Meltblown 25gsm ±6%	Polypropylene
Layer 3	Filter layer 3	Meltblown 25gsm ±6%	Polypropylene
Layer 4	Inner layer 4	Spunbond 25gsm ±6%	Polypropylene
nose clip	Nose strip	4mm ±10%	plastic coated double wire
earloop	Ear band	flat hollow string 4mm ±10%	Polyamid 81% Elasthan 19%

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
10/20 pcs masks in carton with masks individually packed in flowpack.
The packaging gives enough protection against mechanical damage or contamination.
PASSED

7.5 Material
- conditioning S.W.: Sample nr: 409-16 to 409-18
  None of the particle filtering half masks have suffered mechanical failure of the facepiece or straps.
- conditioning T.C.: Sample nr.: 409-41 to 409-43
  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 ± 0,2) m for 5 min;
   - crawling on the level with headroom of (0,70 ± 0,05) m for 5 min;
   - filling a small basket 20x in 10 min;

Subjects	Samples	Conditioning	Result
BP	409-1	A.R.	PASSED
SA	409-2	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
VBA	110	115	115	55
NT	122	134	142	57
NA	115	100	125	50
DF	108	136	105	55
GZ	154	149	113	65
OJ	130	105	107	54
RE	115	138	112	48
PA	120	165	120	70
TZS	100	125	125	50

Subject	**Sample**	**Cond.**	**Total inward leakage, %**					**Mean, %**
			Walk	**Head left/right**	**Head up/down**	**Talk**	**Walk**	
GL	409-3	A.R.	2,98	9,25	9,34	7,38	5,03	6,80
VBA	409-4	A.R.	4,49	4,64	6,24	10,63	5,60	6,32
NT	409-5	A.R.	2,85	3,26	2,37	1,38	1,23	2,22
NA	409-6	A.R.	2,43	3,12	4,24	3,74	4,51	3,61
TZS	409-7	A.R.	3,58	3,47	3,33	4,57	3,62	3,71
PA	409-8	T.C.	3,79	4,30	3,51	6,41	3,65	4,33
DF	409-9	T.C.	5,46	4,49	4,87	7,86	5,40	5,62
GZ	409-10	T.C.	2,87	2,48	2,38	2,73	2,51	2,59
RE	409-11	T.C.	3,92	3,90	5,77	4,08	4,45	4,42
OJ	409-12	T.C.	4,11	4,28	4,49	6,19	3,95	4,60

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/m^3, flow: 95 l/min

Sample	**Conditioning**	**Penetration, %**	**Exposure, %**
409-13	A.R.	0,15	NA
409-14	A.R.	0,15	NA
409-15	A.R.	0,73	NA
409-16	S.W.	0,02	NA
409-17	S.W.	0,05	NA
409-18	S.W.	0,05	NA
409-19	M.S→T.C.	NA	0,14
409-20	M.S→T.C.	NA	0,08
409-21	M.S→T.C.	NA	0,26
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/m^3, flow: 95 l/min

Sample	Conditioning	Penetration, %	Exposure, %
409-22	A.R.	0,25	NA
409-23	A.R.	0,22	NA
409-24	A.R.	0,27	NA
409-25	S.W.	0,16	NA
409-26	S.W.	0,15	NA
409-27	S.W.	0,38	NA
409-28	M.S→T.C.	NA	0,87
409-29	M.S→T.C.	NA	1,44
409-30	M.S→T.C.	NA	0,61
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
409-33	T.C.
409-34	T.C.
409-31	A.R.
409-32	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: 0,07 % (less than 0,1 %.)

Sample	CO_2, V/V%
409-35	0,43
409-36	0,42
409-37	0,46
Average	**0,44**

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
409-1
409-2

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, mbar		Exhalation reistance, mbar 160 l/min				
		30 l/min	95 l/min	ahead	vert.upwards	vert downwards	left	right
409-38	A.R.	0,27	0,82	1,36	1,36	1,37	1,36	1,36
409-39	A.R.	0,30	0,96	1,41	1,42	1,43	1,42	1,41
409-40	A.R.	0,28	0,90	1,33	1,33	1,32	1,31	1,32
409-41	T.C.	0,26	0,80	1,29	1,30	1,31	1,30	1,30
409-42	T.C.	0,25	0,79	1,24	1,25	1,26	1,26	1,25
409-43	T.C.	0,26	0,81	1,27	1,27	1,26	1,25	1,26
409-44	S.W.	0,28	0,86	1,33	1,34	1,34	1,33	1,32
409-45	S.W.	0,27	0,87	1,37	1,38	1,37	1,38	1,37
409-46	S.W.	0,28	0,92	1,42	1,42	1,41	1,41	1,42
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 **DODO 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.

E N D O F T H E T E S T R E P O R T