

Filter penetration test Face masks (NEN-EN 149)



Certificate number: 140420DELE006

Customer

Company : **FPMask International b.v.**
Street : **Beethovenlaan 7**
ZIP code : **5216XK**
City : **Den Bosch**

Object

ID number : **TNE80**
Supplier : **FPMask International b.v.**
Brand : **FP Mask**
Type : **Multi Layer System**
Class : **NA**

Method of investigation

The tests were performed in accordance with Kalibra protocol PR-VAL-017. This protocol is based on the requirements in accordance with NEN-EN149 and test methods as described in NEN-EN 13274-7. Reference standards have been used to perform the measurements as stated under "Reference equipment".

Test results

Results are presented at the sheets below.
Test results are tested against the requirements as stated in NEN-EN 149.
The results only say something about the efficiency of the tested masks and do not give any guarantees about the further functionality of the masks in accordance with the standard.

Reference equipment

Reg. No.	Description	Type	Cal. Date	Due Date
X079-01	Aerosol generator	Topas 226	nvt	nvt
150702012	Deeltjesteller	Handheld 3016	1-apr-2020	1-mei-2021
130744019	Deeltjesteller	Handheld 3016	1-nov-2019	1-dec-2020
T95351537007	Anemometer	TSI 9535	19-okt-1905	1-nov-2020
70066	Drukmeter	Fluke 992	8-nov-2019	1-dec-2020

Performed by

Date : **14-apr-2020**
Validation Engineer : **Dennis Leeuwenkuyl**
Result : **Comply to the requirements of FFP1**

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Summary test results

ID number : **TNE80**
Supplier : **FPMask International b.v.**
Brand : **FP Mask**
Type : **Multi Layer System**
Class : **NA**

To determine the particle penetration of the masks, tests were carried out on 3 different masks.
At least 5 measurements were taken per mask. Below is the average of 5 measurements.

Classification in accordance with NEN-EN 149

Class : Efficiency @ 95 l/min
FFP 1 : $\geq 80\%$
FFP 2 : $\geq 94\%$
FFP 3 : $\geq 99\%$

Test medium : NaCl
Flow : 32 l/min in test set-up with a face velocity of 0,11m/s (approx. 95 l/min over total mask)

	Average efficiency for particles $\geq 0,3\mu\text{m}$	Conclusion (class)	Average efficiency for particles $\geq 0,5\mu\text{m}$	Conclusion (class)
Mask 1	84,90%	Comply to P1	92,27%	Comply to P1
Mask 2	90,14%	Comply to P1	95,35%	Comply to P2
Mask 3	90,07%	Comply to P1	95,24%	Comply to P2

Overall average	88,37%	Comply to P1
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94,29%	Comply to P2
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Overall conclusion:

Comply to the requirements of class P1 (Particle of 0,3um)

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Measurement results

ID number : TNE80
 Supplier : FPMask International b.v.
 Brand : FP Mask
 Type : Multi Layer System
 Class : NA

Mask	Measurement	Particle size	Upstream	Downstream	Efficiency	Average
1	1	≥ 0,3µm	269.162.382	40.850.593	84,8%	84,9%
	2		269.897.633	41.351.002	84,7%	
	3		271.745.297	40.880.963	85,0%	
	4		270.454.192	41.084.023	84,8%	
	5		271.028.762	39.961.723	85,3%	
	1	≥ 0,5µm	63.134.147	4.944.759	92,2%	92,3%
	2		63.129.556	4.926.749	92,2%	
	3		64.042.794	4.930.633	92,3%	
	4		63.590.766	4.930.633	92,2%	
	5		63.938.262	4.837.049	92,4%	
2	1	≥ 0,3µm	271.159.779	26.709.541	90,1%	90,1%
	2		273.064.652	26.689.765	90,2%	
	3		273.091.138	27.244.558	90,0%	
	4		275.276.057	27.273.869	90,1%	
	5		276.852.857	27.057.390	90,2%	
	1	≥ 0,5µm	63.843.619	2.971.729	95,3%	95,4%
	2		64.216.895	2.947.715	95,4%	
	3		65.183.810	3.069.550	95,3%	
	4		65.740.723	3.097.096	95,3%	
	5		65.847.726	3.017.991	95,4%	
3	1	≥ 0,3µm	275.920.549	26.662.219	90,3%	90,1%
	2		275.804.717	27.091.999	90,2%	
	3		275.254.880	27.402.768	90,0%	
	4		275.677.585	27.749.205	89,9%	
	5		273.448.523	27.770.394	89,8%	
	1	≥ 0,5µm	65.746.373	2.999.627	95,4%	95,2%
	2		65.997.813	3.079.085	95,3%	
	3		64.507.888	3.177.613	95,1%	
	4		65.535.544	3.140.180	95,2%	
	5		64.772.395	3.131.351	95,2%	

Resistance over mask @ 95lpm *

Mask 1	22	Mask 2	22	Mask 3	22
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* the resistance is measured at a flow of approx. 30 lpm. Tests are executed over an surface of 44 cm². The reported values are a factor 3 compared to the measured values.

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Photo('s) of tested masks

