



Report name: *Three-Ply Surgical Mask Testing*

Date: 05/17/2020

Report number: 199-1247

### Laboratory Data

Report No: 199-1247

Date: 05/17/2020

Test Laboratory: *Safety & Environmental Laboratory*

Operator: *Hossein Yousefi*

Supervisor: *Prof. Asghar Sadighzadeh*

Particle Counter(s): *Particle Counter(s): Condensation Particle Counter (Grimm) and Laser Particle Counter (Grimm)*

Manometer: *Kimo MP 202*

### Device Manufacturer's Data

Manufacturer: *FANPAYA Co.*

Product Name: *Three-Ply Surgical Mask*

Product Model declared by manufacturer: -

Test requested by: *FANPAYA Co.*

Sample obtained from: *Dr. Noorpoor AliReza*

### Test Conditions

Temperature (°C): 27

RH (%): <15

Air flow rate (l/min)<sup>1</sup>: 5, 10, 15, 20, 25, 30

<sup>1</sup>Liter Per minute





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## Three-Ply Surgical Mask test

Note: Mask surface area used for test is 100 cm<sup>2</sup>.

### I. Pressure drop $\Delta P$ as a function of air flow rate $Q$

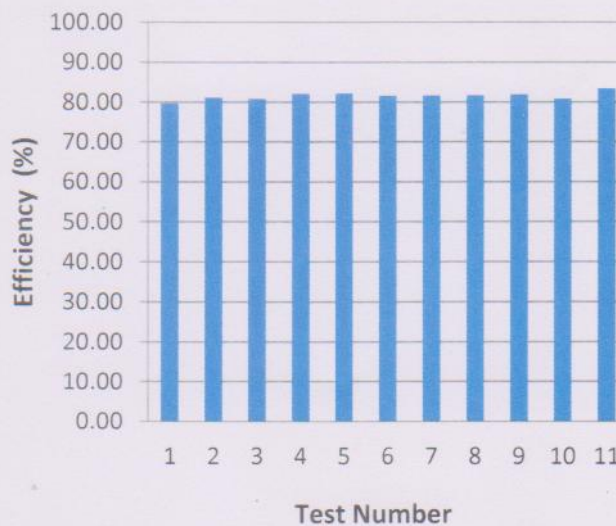
$Q$ (l/min)	5	10	15	20	25	30
$\Delta P$ (P <sup>2</sup> )	5	12	18	25	31	36

### II. Efficiency $E$

#### a. Total removal efficiency for aerosol particle with diameter $\geq 3$ nm<sup>3</sup>

Data extracted by Condensation Particle Counter (CPC)

Average removal efficiency for aerosol particles with diameter  $\geq 3$  nm: 81.61 %



<sup>2</sup> Pascale  
<sup>3</sup> nanometer



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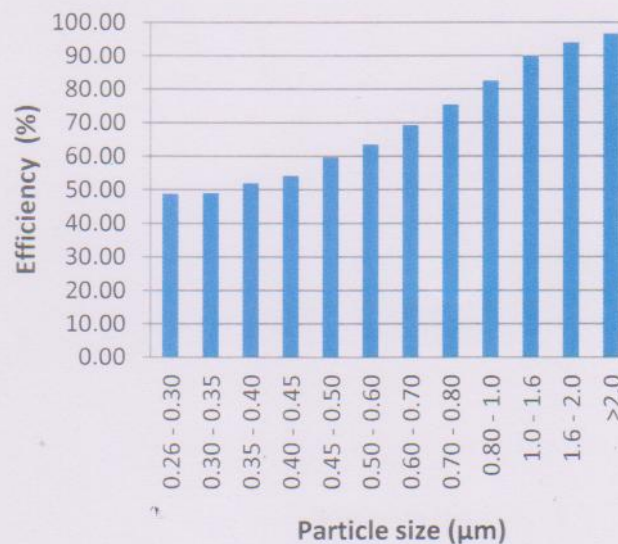
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b. Removal efficiency in term of aerosol particle size (Dp)

Data extracted from Laser Particle Counter (Grimm)

particle size Dp ( $\mu\text{m}$ )	Average of 40 measures $N_i^4$ (p/l) <sup>5</sup>	Average of 40 Measures $N_j^6$ (p/l)	Efficiency (%)	Flow rate Q (l/min)
0.26 - 0.30	1.95E+04	9.99E+03	48.85	30
0.30 - 0.35	1.38E+04	7.02E+03	49.10	
0.35 - 0.40	6.97E+03	3.34E+03	52.01	
0.40 - 0.45	2.16E+03	9.87E+02	54.29	
0.45 - 0.50	1.75E+03	7.06E+02	59.69	
0.50 - 0.60	1.24E+03	4.51E+02	63.51	
0.60 - 0.70	1.02E+03	3.13E+02	69.30	
0.70 - 0.80	5.50E+02	1.35E+02	75.53	
0.80 - 1.0	7.27E+02	1.26E+02	82.67	
1.0 - 1.6	4.62E+02	4.50E+01	90.26	
1.6 - 2.0	1.84E+02	1.10E+01	94.05	
>2.0	3.22E+02	1.06E+01	96.71	



<sup>4</sup> Particles Number concentration in upstream of the mask

<sup>5</sup> Particle per liter

<sup>6</sup> Particles Number concentration in downstream of the mask