

## Sodium Chloride (NaCl) Aerosol Test Final Report

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Test Article: Happy Masks Filters  
Purchase Order: 1  
Study Number: 1364581-S01  
Study Received Date: 18 Nov 2020  
Testing Facility: Nelson Laboratories, LLC  
6280 S. Redwood Rd.  
Salt Lake City, UT 84123 U.S.A.  
Test Procedure(s): Standard Test Protocol (STP) Number: STP0014 Rev 09  
Deviation(s): None

**Summary:** This procedure was performed to evaluate the particle penetration and airflow resistance properties of filtration materials. A neutralized, poly-dispersed aerosol of sodium chloride (NaCl) was generated and passed through the test article. The performance of the test article was assessed by measuring the concentration of salt particles penetrating the test article compared to the challenge concentration entering the test article. The filtration performance and airflow resistance of each test article were calculated.

The filter tester used in testing was a TSI® CERTITEST® Model 8130 Automated Filter Tester that is capable of efficiency measurements of up to 99.999%. It produced a particle size distribution with a count median diameter of  $0.075 \pm 0.020$  microns ( $\mu\text{m}$ ) and a geometric standard deviation not exceeding  $1.86 \mu\text{m}$ . The mass median diameter was approximately  $0.26 \mu\text{m}$ , which is generally accepted as the most penetrating aerosol size. All test method acceptance criteria were met. Testing was performed in compliance with US FDA good manufacturing practice (GMP) regulations 21 CFR Parts 210, 211 and 820.

Area Tested:  $100 \text{ cm}^2$   
Airflow Rate:  $85 \pm 4$  liters per minute (L/min)  
Test Side: "X" Marked Side  
Test Type: Initial Penetration (~1 min. LOAD Test)  
Conditioning Parameters:  $38 \pm 2.5^\circ\text{C}$ ,  $85 \pm 5\%$  relative humidity (RH) for  $25 \pm 1$  hour



Natalie Brady electronically approved for  
Study Director

Curtis Gerow

16 Dec 2020 15:43 (+00:00)  
Study Completion Date and Time

**Results:**

Test Article Number	Initial Airflow Resistance (mm H <sub>2</sub> O)	Particle Penetration (%)	Filtration Efficiency (%)
1	16.6	1.34	98.66
2	16.0	<0.001 <sup>a</sup>	>99.999 <sup>b</sup>
3	24.1	<0.001 <sup>a</sup>	>99.999 <sup>b</sup>
4	16.8	2.80	97.20
5	16.9	3.82	96.18

<sup>a</sup> No particle penetration was detected through this test article.

<sup>b</sup> There were no detected particles penetrating this filter during testing.