Particle Filtration Efficiency (PFE) and Differential Pressure (Delta P) Final Report

Report No.	PFE20210929-04
Sponsor	Tawat Machine Tech Limited Partnership
Address	228 Moo. 10, T.BanKlang, Muang Lamphun, Lamphun 51000
Study Number	192219-S04
Testing Date	29 September 2021
Expired Date	28 September 2022
Testing Facility	RUEE, Research Unit of Applied Electric Field in Engineering
Test Procedure	PFE Standard Test Method: PTSM0001 Rev 3

Summary: This procedure was performed to evaluate the non-viable particle filtration efficiency of the test article and employed the basic particle filtration method described in ASTM F2299-03. Polystyrene Latex (PSL) were nebulized Mono-dispersedly and passed through the test article. The test procedure measures filtration efficiency by comparing between the particle concentration count in the upstream and the downstream ones.

Filtered and dried air is passed through an atomizer to produce an aerosol containing suspended latex spheres. This aerosol is then passed through a charge neutralizer. The aerosol is then mixed and diluted with additional preconditioned air to produce a stable, neutralized, and dried aerosal of latex spheres.

One-minute particle concentration count were performed, with and without the test article in the system. The filtration efficiency was calculated using the average number of particles penetrating the test article compared to the average of the control values.

Area of Test:	17.80 cm^2
Particle Size:	0.1 µm
Face Velocity:	10.6 cm/s
Environment:	24 ±3°C and 59 ±5% relative humidity (RH) for 4 hours
References:	TSI Classifier Model 3082 S/N: 3082001807003,
	TSI CPC Model 3788 S/N: 3788180801,
Average Filtration Efficiency:	99.69%

Test Article Number	Upstream Counts (particles/cm^3)	Downstream Counts (particles/cm^3)	Filtration Efficiency
1	14,251.00	45.23	99.68%
2	14,326.00	48.95	99.66%
3	14,105.00	38.52	99.73%
4	14,269.00	41.05	99.71%
5	14,322.00	45.26	99.68%

Study Director Assoc. Prof. Dr. Panich Intra

29-Sep-2021

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Test Procedure Delta P Standard Test Method: DPSTM0001 Rev 1

Summary: This Delta P test is performed to determine the breathability of test articles by measuring the differential air pressure on either side of the test article, using a manometer, at a constant flow rate.

Area of Test: 4.9 cm^2

Delta P Flow Rate: 8 L/min

References: Dwyer Manometer Model 1211-30 S/N: S677041
Dwyer Manometer Model 1211-30 S/N: S231662
Dwyer Flow Controller Model GFC-1111 S/N: G142241-1C

Test Article Number	Delta P (mmH_2O)	Delta P (mmH_2O/cm^2)	Delta P (Pa/cm^2)
1	25.40	5.18	50.83
2	25.40	5.18	50.83
3	25.40	5.18	50.83
4	25.40	5.18	50.83
5	25.40	5.18	50.83

*** End of Report ***

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Reference Note:

TF98 White

Study Director Assoc. Prof. Dr. Panich Intra

29-Sep-2021
Study Completion Date