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Measurement Report

MEASUREMENT OF INITIAL FILTRATION EFFICIENCY AND INITIAL RESISTANCE OF RESPIRATORS From Lot MT1

For

Strata Engineering / Vitacore Group
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DESCRIPTION Respirators, from Lot MT1 were labeled as indicated in the results table and tested for initial filtration efficiency and initial resistance using a TSI 8130A Automated Filter Tester.

MEASUREMENT The initial filtration efficiencies and pressure drop across the respirator (initial resistance) was determined on the date(s) indicated using the facilities listed on the results table, by measurement on a TSI 8130A Automated Filter Tester in NRC according to procedure MS-6.3 Rev1.0 Loading Tests for Evaluation of Filter Efficiency of Respirators. The procedure is consistent with the letter of request from PHAC to NRC dated 2020-04-17.

The respirators were challenged for 5 minutes under a flow of 85 L/min \pm 4 L/min in which an aerosol of NaCl particles were generated to a concentration less than 200 mg/m³. The NaCl particles were generated by a TSI Aerosol Generator Model 8118A and neutralized to their Boltzmann equilibrium state. The NaCl particle sizes generated are considered to have a count mean diameter of 75 \pm 20 nm with a geometric standard deviation not exceeding 1.86. The laboratory temperature was between 20 °C and 28 °C, and relative humidity between 20 % and 40 %. If the respirator underwent conditioning as described in Note 3, it is indicated in the results table; "C" for conditioned, "U" for unconditioned.

**EQUIPMENT
& CALIBRATION****NRC Test Facility M36-406B**

The TSI 8130A Automated Filter Tester, S/N 1572006438 has received a Certificate of Conformance issued by TSI on 2020-04-17 and has been validated through comparison. The TSI upstream and downstream photometers Module 8175200802 have been factory calibrated 2020-04-21 (20200421 Cal Report Photometer sn8175200802.pdf). The TSI mass flowmeter Model 4045, S/N 40451938005 is traceable to the SI through NIST and TSI procedure 10000021269 (20190916 Cal Report TSI 4045 Flow Meter sn40451938005.pdf). Pressure measurements are traceable to the SI through NIST via Dwyer Certificate of Calibration 20DWY09-296 (20200108 Cal Report Dwyer 20DWY09-296 Pressure gauge 475-1-FM snS353493-002). Humidity and Temperature were measured using a Control Company / Traceable Products digital hygrometer Model 4085, S/N 200248740 and is traceable to the SI through NIST via Certificate of Calibration 4085-11238003 (4085-11238003 Control Hygrometer sn200248740.pdf).

NRC Test Facility M36-B119

The TSI 8130A Automated Filter Tester, S/N 1572006430 has received a Certificate of Conformance issued by TSI on 2020-04-07 and has been validated through comparison. The TSI upstream and downstream photometers Module 8175195103 have been factory calibrated 2020-04-07 (20200407 Cal Report Photometer sn8175195103.pdf). The TSI mass flowmeter Model 4045, S/N 40452008005 is traceable to the SI through NIST and TSI procedure 10000021269 (20200222 Cal Report TSI 4045 Flow Meter sn40452008005.pdf). Pressure measurements are traceable to the SI through NIST via Dwyer Certificate of Calibration 20DWY09-296 (20200108 Cal Report Dwyer 20DWY09-296 Pressure gauge 475-1-FM snS353493-002). Humidity and Temperature were measured using a Control Company / Traceable Products digital hygrometer Model 4085, S/N 200248740 and is traceable to the SI through NIST via Certificate of Calibration 4085-10915502 (4085-10915502 Control Hygrometer sn192681402.pdf).

RESULTS

The results of initial resistance and initial filtration efficiencies.

Label	Date Tested (yyyy-mm-dd)	C/U	Test Facility	Initial Resistance [Pa]	Initial Filtration [%]
076_MT1_R_001	2020-07-17	C	M36-B119	124	97.5
076_MT1_R_002	2020-07-17	C	M36-B119	124	98.2
076_MT1_R_003	2020-07-17	C	M36-B119	154	96.5
076_MT1_R_004	2020-07-17	C	M36-B119	164	98.4
076_MT1_R_005	2020-07-17	C	M36-B119	144	98.5
076_MT1_R_006	2020-07-17	C	M36-B119	136	98.3
076_MT1_R_007	2020-07-17	C	M36-B119	136	98.5
076_MT1_R_008	2020-07-17	C	M36-B119	156	98.2
076_MT1_R_009	2020-07-17	C	M36-B119	131	97.7
076_MT1_R_010	2020-07-17	C	M36-B119	177	98.2
076_MT1_R_011	2020-07-17	C	M36-406B	162	98.1
076_MT1_R_012	2020-07-17	C	M36-406B	135	98.1
076_MT1_R_013	2020-07-17	C	M36-406B	141	98.4
076_MT1_R_014	2020-07-17	C	M36-406B	156	98.2
076_MT1_R_015	2020-07-17	C	M36-406B	171	98.4
076_MT1_R_016	2020-07-17	C	M36-406B	171	97.9
076_MT1_R_017	2020-07-17	C	M36-406B	194	97.7
076_MT1_R_018	2020-07-17	C	M36-406B	137	98.3
076_MT1_R_019	2020-07-17	C	M36-406B	149	97.0
076_MT1_R_020	2020-07-17	C	M36-406B	157	98.3

Average	151	98.0
Std. Dev.	19	0.5
Max	194	98.5
Min	124	96.5
Range	70	2.0

NOTES

1. Measurement uncertainties specified in this report are expanded uncertainties representing a confidence level of approximately 95% obtained by multiplying the combined standard uncertainty (one standard deviation) by a coverage factor of $k=2$. For more detailed information, refer to the *Guide to the Expression of Uncertainty in Measurement* (JCGM 100:2008).
2. The measurement results correspond to the performance of the respirator at the time and under the conditions of testing. The pressure uncertainty is estimated to be 6 Pa. Uncertainties in temperature and relative humidity are 0.5 °C and 1.5 % respectively. Uncertainties corresponding to the long term stability, ambient conditions and manner of use should be accounted for by the user.

3. Conditioning of respirators if indicated was performed for 25 ± 1 hour at $85 \% \pm 5\%$ relative humidity and $38 \text{ }^\circ\text{C} \pm 2.5 \text{ }^\circ\text{C}$ and tested within in 10 hours of extraction from the conditioning chamber as indicated in NIOSH standard procedure TEB-APR-STP-0059.
4. Any queries regarding this report or the services provided by the Metrology Research Centre should be addressed to:

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