S1.5.3 - *NEW Filtration Standard for Barrier Face Coverings*

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Due to the heath care emergency in 2020, NIOSH identified a gap in standardization for community/barrier face coverings, since these were not respirators or medical masks. This type of device falls outside of NIOSH regulatory responsibility so ASTM initiated a work item within the ASTM F23.65 subcommittee to develop a standard. This work began in July of 2020 and frequent meetings were held until December, at which time a ballot was submitted. After review of the comments the standard was published in February 2021. This is a very quick process for a consensus standard development but was driven by a large group of people to meet a critical need. The title for ASTM F3502-21 is “Standard Specification for Barrier Face Coverings”. These BFCs are described as having a primary purpose of providing source control and to provide a degree of particulate filtration to reduce the amount of inhaled particulate matter. BFCs must cover both the nose and mouth and be designed in a way to minimize the leakage around the BFC. There are two main testing requirements for BFCs. The filter efficiency is measured in a manner similar to the N category (tested with NaCl) of respirators in the NIOSH 42 CFR part 84 standard. The BFC standard requires a minimum filter efficiency of 20% and a maximum pressure drop of 15 mm H2O when the BFC is tested at 85 Lpm. Two independent performance levels are specified for

both efficiency and breathability but the efficiency and air flow resistance are reported rounded to integer values of efficiency and resistance. This allows the use of the automated filter testers that are used for respirator testers by NIOSH and respirator manufacturers for both the filter testing for both the efficiency test and the filter resistance tests. It shall be noted that the filter efficiency is only an initial efficiency measurement for BFCs (respirators have a loading test) and only an inhalation pressure drop (breathability) is measured (exhalation valves are not allowed). A third requirement is for a design analysis self-declaration to minimize leakage around the mask. Quantitative testing according to newly published ASTM F3407-20 to supplement the design analysis is suggested but is optional. This test method for quantitative fit testing can for example be done with a PortaCount respirator fit tester which uses condensation particle counting technology to count sub-micrometer particles inside and outside of a mask to determine a quantitative fit factor. This new standard provides a consistent way on how to benchmark barrier face coverings for more informed user selection decisions and guidance on how to assess performance requirements for the protection for the wearer and the people around.

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Tim Johnson has a Bachelor's degree in Physics from Macalester College in St. Paul Minnesota. He has worked at TSI Incorporated for over 42 years and has worked with the Automated Filter Tester products since 1990. He is currently Senior Application Engineer in the Particle Instruments product group. He is responsible for training in particle instruments used in detecting, sizing and measuring concentrations of particles in the air. He has served on a number of product development teams developing instrumentation for counting and sizing airborne particles as well as automated filter testing equipment. He is responsible for the product applications using automated filter test equipment and components used in filter testing applications. He is a member of on the American Filtration and Separation Society (AFS). He is actively involved in the ASHRAE on the TC 2.4 committee. He is a member of ISO/TC142, expert on ISO/TC142/WG 3 (general ventilation filters) and is a co-convener of JWG11

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