



FALL VIRTUAL CONFERENCE

S1.4: Mask Filtration Efficiency – a New Perspective

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ABSTRACT

During the height of COVID-19 pandemic in the USA, the Particle Science & Technology Laboratory (PSTL) at Southwest Research Institute (SwRI) shifted some of its focus from particle emissions R&D to mask filtration efficiency R&D and testing to help US manufacturers and various stakeholders with a flexible R&D and a quick turnaround service. The PSTL is the only ISO 17025 A2LA accredited calibration laboratory for various particle counters and sizers. First, the service was offered as pro-bono for several months, and later it became a commercial service. The focus was on respirator masks such as N95, KN95, Level 1/2/3 surgical masks, and decontaminated masks using heat and/or hydrogen peroxide. This is in addition to different types of mask materials and applications ranging in efficiency from 8% to 99%.

For the presentation, we will give some background on our approach and will report on the filtration efficiency of several filter media or mask types. We will also discuss several parameters that will impact the filtration efficiency such as neutralized vs un-neutralized particles, velocity, and particle size. We will show that the current approach of mask testing may not protect well against most penetrating particles and the size distribution definition for testing N95 masks is broadly defined. Contrary to that, we will show that the stringency of mask testing for N95 may not be necessary for hospital use, especially in the middle of a pandemic. Such relaxation will allow for more materials to be qualified as N95 respirator masks.