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Presenter/author	Title	Abstract
Cohen, Kathryn S. *U.S. Army Research Laboratory Human Research & Engineering Directorate APG, MD 21005-5425 USA*	**Seal Pressure: A New Measure of Protective Mask Performance**	Currently, protective mask seal designs are evaluated indirectly by measuring fit factor (FF), a ratio of the concentration of particles outside versus inside the mask. This paper describes an alternate process for evaluating mask seals by measuring the pressure distribution between the seal and face. The goal was to develop a relationship between FF and seal pressure. The FF and seal pressure relationship could be used to predict the seal pressure necessary to provide a specific FF or determine whether the seal pressure provided by a mask prototype is sufficient to meet a protection or FF requirement. Pressure was measured using a thin film flexible sensor placed at 11 locations around the seal of an M40 protective mask on a head form. Corresponding FF was measured using a PORTACOUNT® Plus protective mask fit tester. Measurements were made for three degrees of strap tightness over a total of 22 trials. Regression analysis was used to determine the relationship between seal pressure and FF. Data and model analysis indicated a strong relationship between FF and seal pressure (R^2=O.87). Eleven validation trials were conducted to verify predictive capability of the seal pressure and FF relationships. Passing or failing FF was correctly predicted by a single seal pressure measurement in 9 of 11 trials. Seal pressure profiles required for achieving a passing FF with the M40 mask were also determined. These findings suggest that pressure measurement may be a promising new tool for design and evaluation of protective mask seals and may also prove to be beneficial in the evaluation of other head-borne systems.