

Variability of Fit Testing and Its Effect on Total Inward Leakage Testing

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Total inward leakage testing in the laboratory is performed in some countries to try to assure that respirators have good fitting qualities. In the United States, NIOSH recently provided notice that advancements in fit testing made it possible to add a fitting requirement to the certification process. The agency is currently doing benchmark testing to develop a total inward leakage test that would be part of certification. Two major issues for a certification test on face fitting involve the definition of an acceptable criterion and the reproducibility of face fitting tests on a panel of people. Modeling of respirator performance indicates the poorest performing respirator is one for which 50 to 70% of the population of users have fit factors less than 100. Repeat measures of fit on panels of people with varying face sizes shows that fit is a highly variable quantity. The high variability of fit makes the separation of "poor" fitting respirator from "good" fitting respirators difficult. It is expected that a fit test panel could have as many as 50% register fit factors of less than 100 and still provide acceptable respirator performance in the workplace.