

## ISRP 2000 abstract

Presenter/author	Title	Abstract
<b>Gardner, Paul</b> Research engineer, US Army Edgewood CB Center, Aberdeen Proving Ground, MD, USA	<b>The Effect of Moisture on the Face Seal Fit of Half-Mask Respirators</b>	<p>A study was conducted to investigate the effect that moisture has on the face seal fit of half-mask particulate respirators. Respirator fit factor data were obtained while 48 subjects completed two different quantitative fit testing (QNFT) methods under ambient environmental conditions. The two QNFT methods compared were an 8-exercise ambient aerosol protocol, conducted using a commercial condensation nuclei counter fit testing device (Portacount®, TSI, Inc.), and a 10-exercise corn oil aerosol protocol that was performed in an exposure chamber using a forward light-scattering photometer. Four commercial P-100, half-mask, particulate respirators were evaluated. To simulate face sweating, the inside of the respirator facepiece was wetted with water administered from a spray bottle. Fit test trials were performed using dry and wet respirators. Statistical analysis of the dry and wet fit factor results for both QNFT methods showed that respirator fit was not significantly (<math>p &lt; 0.05</math>) degraded due to wetting of the facepiece. However, there was a trend for lower fit factors for each of the respirator models evaluated using the photometer/corn oil aerosol QNFT method. Post-hoc analysis of the Portacount® exercise data revealed significantly lower mean fit factors for the talking, grimace, and bending over exercises (<math>p &lt; 0.02</math>). The grimace exercise was observed in both QNFT methods to cause the greatest degradation in fit. These findings suggest that facial perspiration can degrade the fit of half-mask respirators and that the effect is most pronounced with exaggerated facial movements. The results of this study support the value of wetting the facepiece prior to fit testing and the use of dynamic exercises to provide a more conservative and discerning measure of fit.</p>