ISRP 2000 abstract

Presenter/author	Title	Abstract
Richardson, Grant Stewart Scientific leader, DERA Porton Down, Salisbury, UK	**The Effect of Testing Respirator Components with Real Breather Patterns as Opposed to Constant or Sinusoidal Flow**	Current standards outlining the test methods for both military and industrial respirators require specific components such as canisters and outlet valves to be tested under constant or sinusoidal breathing regimes. Given, (i) the performance of such components is dependent on the test flow conditions, and (ii) the occurrence of high peak flows that are observed during actual breathing cycles, potential exists for component performance to differ markedly when investigated under real breathing patterns compared to other less demanding flow regimes. The advancement of breathing machine technology at DERA Porton Down permits the accurate recording of actual breather flows, which in turn may be reproduced using a digital breathing machine. Consequently, canisters and outlet valve assemblies can be rigorously tested using a series of “real” breathing patterns representing low, medium and high work rates. In addition, other activities such as talking can be mimicked and incorporated into the test regime. This paper reports on the performance of canisters as regards (i) aerosol penetration and vapour breakthrough time, and (ii) the dynamic leakage of the outlet valve using various test flow regimes. For each work rating, the minute volume is maintained as a constant so that a true comparison may be made. Methods for deriving actual flow patterns from internal respirator pressures are also discussed. Adopting this approach permits breathing patterns to be easily recorded using a single, miniature pressure transducer as opposed to a complex and cumbersome flow arrangement.