

ISRP 2002 abstract

Presenter/author	Title	Abstract
Zhuang, Ziqing <i>National Personal Protection Laboratory, NIOSH, Pittsburgh, Pennsylvania, USA</i>	Correlation between Quantitative Fit Factors and Protection Factors Measured under Actual Workplace Environments at a Steel Foundry	<p>Past studies have found little to no correlation between workplace protection factors and quantitative fit factors (FFs). The purpose of this new study was to investigate the correlation between FFs and protection factors (PF) for half-facepiece, air-purifying respirators under actual workplace environments at a steel foundry. Fifteen burners, welders, and chippers wore two respirator models. Each worker donned a respirator twice per day for two days. Quantitative FFs were first obtained for each donning using the PortaCount Plus in a separate room. Without redonning the respirators, workers performed normal work for one to two hours, and protection factors were measured by collecting ambient and in-facepiece samples simultaneously. A second fit-test was conducted without redonning the respirator. Fit factors were obtained by averaging the results from the first and second fit-tests.</p> <p>The resulting FFs had a geometric mean (GM) of 400 (range=10-6010) and a geometric standard deviation (GSD) of 6.1. The protection factors had a GM of 920 (range=13-230000) and a GSD of 17.8. The protection factors were found to be significantly correlated with the FFs ($R^2=0.55$ and $p\text{-value}=0.0001$). This field study has, therefore, shown fit factor to be a meaningful indicator of respirator performance under actual workplace environments.</p>