

Comparing Real-Time Fit Factors to Traditional Fit Factors by OSHA Exercise for N95 Respirators

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ABSTRACT

Objectives: This project compares respirator fit using two methods: 1) the traditional OSHA fit test using a single Portacount and alternating measurements of particle concentration inside and outside the respirator and 2) a newly-developed “real-time” method that uses two Portacounts simultaneously measuring inside and outside particle concentrations.

Methods: Sixteen human subjects of varying face size (width and length) were recruited. After donning an N95 FFR subjects randomly performed a traditional or a real-time fit test, followed immediately by the opposite test without removing the respirator. For each test, subjects completed the 8 exercises as prescribed by the OSHA protocol. Fit factors were compared by fit test method and by order of tests for each exercise and for all exercises combined using a correlation analysis.

Results: The real-time fit factors ranged from 1 to 1,226. Traditional fit factors ranged from 2 to 2,020; Pearson’s correlation coefficients (r) of the fit factors for individual exercises ranged from 0.03 to 0.76 when compared by fit test and from 0.12 to 1.00 when compared by order of tests.

Conclusions: The significantly high correlation between overall fit factors for the traditional and real-time fit test suggest that the new real-time method can be used in future experiments to further examine the effect of specific workplace tasks on respirator fit. Lower correlation was seen in exercises after grimace suggesting that respirator fit may be dependent on the re-seating of the respirator on the face immediately after significant facial movement.

I would prefer to give a platform presentation and not a poster presentation