

EUROPEAN AND AMERICAN RESPIRATOR FIT TESTING: Comparison of the Particle Penetration Test — Methods and Adaptation of the Test Equipment

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The certification and quality control of respirator filters filtering face pieces etc. as personal protection equipment is regulated and standardized world wide. In the USA 42 CFR part 84 describes how to test and classify such filters. In Europe the CEN standard EN 143 describes how to test filters for respiratory protection. While both the American regulation and the European test standard use sodium chloride and oil droplets as test aerosol both standards are substantially different such that test results obtained are not directly comparable. In November 2007 a measurement campaign was run at BGIA (accredited respirator filter certification laboratory in Sankt Augustin Germany). The goal of this campaign was to analyse if a filter tester originally designed for 42 CFR 84 compliant certification and quality control testing (TSI model 8130) can be modified to give results which are equivalent to the results obtained using European EN 143 compliant test equipment. It was found that modifications of both the paraffin oil and NaCl aerosol generation system are necessary (and sufficient) to obtain EN 143 equivalent results. Following these modifications comparison measurements with different grades of both glass fiber and electrostatic filter media resulted in particle penetrations which were in good agreement over a wide range of penetrations from 0.002% to 10%.