3M

Technical Performance Bulletin OH&ESD

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Replaces all previously published materials on this subject until superseded.

3M™ M-400 Series Helmets
Assigned Protection Factor

On August 24, 2006, the Occupational Safety and Health Administration (OSHA) amended its regulation for respiratory protection by adding definitions and requirements for Assigned Protection Factors (APFs). According to OSHA 29 CFR 1910.134 (d)(3)(i)(A), APF Table 1 footnote 4, "The employer must have evidence provided by the respirator manufacturer that testing of these respirators [*hoods and helmets*] demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF [*Workplace Protection Factor*] or SWPF [*Simulated Workplace Protection Factor*] study or equivalent testing…"

To satisfy this requirement, the following study was conducted to support of an APF of 1000 for the M-400 Series Helmets when used in combination with approved 3M systems.

Respirators Tested[1]	M-405 Helmet Assembly, BT-20L and BT-20S breathing tubes, and GVP Powered Air Purifying Respirator (PAPR) set at 6 CFM.
Test Type	Small particle (NaCl) quantitative performance testing
Test subjects	25 Member NIOSH Bivariate Fit Test Panel
Exercises performed[2]	Normal breathing Deep breathing Head movements Stair climbing Callisthenic arm movements Reading rainbow passage On hands and knees - turn head side to side Tire pumping Normal breathing

Criteria[3]	95% or more of test subjects must achieve a fit factor of greater than 10,000
Conclusion	All test criteria above were met; therefore this testing supports an APF of 1000 for the M-400 Series Helmets when used in combination with approved 3M systems.
For Information	Contact 3M OH&ES Technical Service at 1-800-243-4630

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1 Additional approved system combinations (powered air purifying and continuous flow supplied air) were tested in smaller supplemental panels to confirm similar performance.

2 Selected from exercises outlined in: NIOSH CET-PAPR-STP-CBRN-0553, *Determination of Laboratory Respirator Protection Level (LRPL) Quantitative Medium Flow, Deep Probe, Corn Oil, Fit Factor Performance Test for CBRN Loose-Fitting PAPR* and NIOSH PAPR or RCT-APR-STP-0005-05a-06, *Determination of Qualitative Isoamyl Acetate (IAA) Facepiece Fit, Air-Purifying Respirators.*

3 Current 3M criteria for small particle quantitative performance testing for hoods and helmets.

3M Occupational Health and Environmental Safety Division
3M Center, Building 235-2W-70
St. Paul, MN 55144-1000