

RESPIRATOR ARTICLE ABSTRACTS

We review the articles published in the American Industrial Hygiene Association Journal (AIHJ) and the Applied Occupational and Environmental Hygiene Journal for information that is applicable to the field of respiratory protection; we then publish abstracts of these articles. We appreciate the cooperation of the American Industrial Hygiene Association and the American Conference of Governmental Hygienists in allowing us to do this.—Ed.

"Review of Respirator Performance Testing in the Workplace: Issues and Concerns," by A. R. Johnston, W. R. Myers, C. E. Colton, J. S. Birkner, C. E. Campbell, *American Industrial Hygiene Association Journal*, November, **53**(11):705–712, 1992.

Performance capability of respirators has traditionally been evaluated by testing components of the respirator (e.g., filter efficiency), facepiece fit, total inward leakage, or some other measure of performance evaluated under laboratory conditions. In recent years, increased emphasis has been placed on development of test methods suitable for evaluating respirator performance in the workplace. The goal of such testing is to evaluate the level of protection provided by respirators in the work environment. The AIHA Respiratory Protection Committee believes that workplace testing of respirators has the potential to be an excellent tool for increasing knowledge about the effectiveness of respiratory protection. However, a number of technical issues remain to be addressed before optimal test protocols and data analysis methods can be defined. The progress made to date in workplace testing will be reviewed, and broader discussion about key elements that must be considered when developing guidelines for testing respirator in the workplace will be initiated.

"Determination of Program Protection Factors for Half-Mask Respirators Used at a Mineral Sands Separation Plant," by Gregory S. Hewson and Martin I. Ralph, *American Industrial Hygiene Association Journal*, November, **53**(11):713-720, 1992.

A study was conducted at a mineral sands separation plant to evaluate the workplace performance of half-mask filter cartridge respirators. Inhalation exposure was estimated by measuring the dust and radioactivity concentration inside the respirator while it was worn or hanging around the worker's neck. The program protection factor was determined by simultaneously measuring inside-mask and ambient (outside-mask) concentrations. A total of 27 tests were conducted, covering three brands of half-mask respirators; facial hair on test subjects ranged from clean-shaven to bearded. Program protection factors varied from 1.8 to 13 for dust exposure and 2.5 to 21 for radioactivity exposure. The geometric mean program protection factor over all tests was 5.1 (geometric standard deviation [GSD] = 1.7) for dust exposure and 7.5 (GSD = 1.7) for radioactivity exposure. A minimum program protection factor of 3.5 could be applied to ambient airborne concentration data to obtain a conservative, but more realistic, estimate of inhalation exposure on a worker category basis.

"A New Sampling Technique That Allows Quantitative Fit Testing by Using the Employee's Own Respirator," by Brian R. Johnson, Kyle A. Bjork, Jeffrey B. Weed, *American Industrial Hygiene Association Journal*, December, 53(12): 776-779, 1992.

A new in-mask sampling technique has been developed that enhances current quantitative respirator fit test methods. This new sampling technique eliminates the need for a permanently modified (probed) respirator for conducting fit tests. With this new technique, a sample was drawn from the breathing zone inside the respirator by means of a sampling adapter, which was temporarily attached between one of the air-purifying filters and the facepiece before a fit test was performed. To ensure that the performance of the respirator was not altered, the sampling adapter was designed so that all major functional aspects of the respirator were unchanged. This new sampling technique was evaluated on human test subjects by simultaneous sampling from a probed respirator by using two quantitative respirator fit test instruments. One instrument sampled through a conventional respirator probe; the other used the new method. Test results show that equivalent fit test data were obtained with both sampling techniques.

