

DU PONT STUDY ON RESPIRATORS FOR ASBESTOS REMOVAL

The Du Pont study on respirators for asbestos removal, discussed in the 11/15/84 Bureau of National Affairs Occupational Safety and Health Reporter, measured protection factors (PF) during asbestos removal operations for a variety of models of negative pressure respirators and for one model of SCBA. The protection factors were determined while employees were involved in asbestos removal by measuring the asbestos concentrations outside (i.e., ambient levels) and inside of the respirator facepiece. This study presents two findings on the protection provided by negative pressure respirators (as discussed below), however, the data in the study does not adequately support the first finding.

- The study concludes that the negative pressure air purifying respirator PF results were not significantly below the results for the SCBA suggesting that similar protection against asbestos would be provided by both types of respirators.
- The study results indicated that all negative pressure respirator models tested resulted in PF of 5 or more for all individuals involved in the study (i.e., 17 individuals).

The data on PF for SCBA presented in this study to support the first finding consists of only two data points corresponding to two individuals wearing the same SCBA unit. This first finding would contradict a large body of data which has been obtained in previous studies on PF for negative pressure respirators and SCBA which show a large difference in the protection obtained between the two types of respirators. Finally, although the average PF from the two SCBA data points approximates the average PF for the other kinds of respirator models tested, a large fraction of the employees tested while wearing negative pressure respirators obtained PF well below the SCBA PF results. Thus this study does not contain adequate data to make the conclusion that the protection factors obtained with SCBA (or supplied air respirators) are comparable with the PF for negative pressure respirator models during asbestos removal operations.

The second finding is important because it addresses the protection obtained while employees were actually involved in asbestos removal operations. The data in the study showed that all of the employees who obtained an adequate fit with a negative pressure respirator (as determined by a saccharin mist qualitative fit test) achieved at least a PF of 5 during the operation and all but one employee achieved a PF of 10 or more during the operation for all models of negative pressure respirators included in the study. The PF determined for negative pressure respirators ranged from 5 to 5600. The study results also showed that some disposable respirators obtained PF comparable if not greater than PF for some models of reusable dual cartridge respirators.

Since the study involved only 17 individuals, it is unlikely that they represent the complete range of facial sizes and shapes in a work population.

The report does not provide any breakdown on factors such as facial size, sex, age, etc., which would help to indicate how representative a panel these individuals were. Thus this study cannot be extrapolated to all employees or all negative pressure respirators. The study does suggest, however, that most individuals would be expected to get a PF of at least 10 with the models of negative pressure respirators tested (if they have achieved an adequate fit with a qualitative fit test) during asbestos removal operations.

This study supports the continued selection and use of negative pressure respirators to control employee exposures to below the OSHA exposure limit; either the current level of 2.0 fibers/cc or the proposed level of either 0.2 or 0.5 fibers/cc. The selection of supplied air respirators or SCBA for asbestos removal operations presents significant potential safety problems associated with climbing ladders, climbing over pipes and other structures and working on staging. SCBA are particularly inappropriate for this kind of operation due to the severe restrictions imposed on physical movement when wearing an SCBA, the added weight burden and increased instability, and the significant time restriction associated with the limited air supply in a SCBA breathing air container. This study does not, however, provide adequate data to respond to the issue of whether employee exposures to asbestos should be reduced to the greatest extent possible by using respirators providing the greatest protection.