

Page 122
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FINDINGS REPORTED IN DUST STUDY IN ASBESTOS TEXTILE INDUSTRY

Results of environmental surveys of nine asbestos textile plants, which account for more than 80% of the workers in the industry, have revealed that dust concentrations as measured by impinger are generally below the Threshold Limit Value, and that estimates relative dustiness from membrane filter samples were in good agreement with those made from impinger samples by either concentration or body burden methods of group. The following information on the U. S. Public Health Service study was given by Jerome R. Lynch and Howard E. Ayer of the Division of Occupational Health (1014 Broadway, Cincinnati, Ohio 45202) at the American Industrial Hygiene Association meeting May 16-21.

A total of 1896 membrane filter samples and 1115 midjet impinger samples were collected using all of the usual and some of the less frequently used methods of sampling for mineral dusts. To examine the relative variability of different count methods of analysis, the variance ratio test was applied to the sample groups by different count methods in each plant and operation. In all cases, the variance ratio test indicated that the difference between the standard deviations by the different methods was not significant ($p > 0.05$) and that none of the methods could be considered less variable than the others. To investigate this further, samples on which magnesium analysis for asbestos were performed were compared with total fiber counts made on the same samples. Again, the differences between standard deviations were not significant, indicating that the variability observed is actually the variability of the environment.

Count-weight ratios obtained by magnesium analyses of membrane filters were 3,000 fibers $> 10 \mu/\mu\text{gm}$ or 5,000 fibers $> 5 \mu/\mu\text{gm}$ or 11,000 total fibers $/\mu\text{gm}$. None of the sets of ratios exhibited any less dispersion than the others. A mass median fiber volume of $50 \mu^3$ obtained from electron micrographs, yielded a count-weight ratio of 8,000 fibers $/\mu\text{gm}$ which was of the same order of magnitude as the ratio obtained by magnesium analysis.

It was concluded that the impinger is as convenient as any other method and in view of the large variance found in the environment, no less accurate than other measurements; however, it is difficult to reconcile the basing of the hygienic criteria on count dominated by grains while the fibers are thought to be the causes of disease. In this respect the counting of fibers on membrane filters appears to have an advantage, especially in industries where asbestos is only a small fraction of the airborne dust. The relevance of magnesium analysis for asbestos is unknown and the method involving the use of sophisticated and expensive laboratory equipment; however, it is hoped that the intensive study of total and respirable mass concentrations made possible by this method, will lead to the development of a relevant and convenient mass sampling method.

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