

PLAINTIFF'S
EXHIBIT
FD-196

A COMPARISON OF IMPINGER AND MEMBRANE FILTER TECHNIQUES FOR EVALUATING AIR SAMPLES IN ASBESTOS PLANTS

Howard E. Ayer, Jeremiah R. Lynch, Julius H. Fannery
Division of Occupational Health, Public Health Service
Department of Health, Education and Welfare
Cincinnati, Ohio

INTRODUCTION

Although data had been presented by a number of other authors,¹ the more definitive studies of health hazards in the United States asbestos industry are probably those of the Pennsylvania Department of Labor and Industry in 1935² and the U. S. Public Health Service and the North Carolina State Board of Health in 1937.³ These studies of asbestos plants correlated exposure to asbestos dust with the incidence of asbestosis among workers. The exposure was evaluated by the same instruments and methods used in studies of other dusty trades (e.g., granite finishing, cement manufacturing).⁴ The sampling instrument used was the Greenburg-Smith impinger, and samples obtained were counted in the sampling liquid using a 1 mm. deep counting cell, allowing the particles to settle for at least 20 minutes and counting the settled particles with a microscope equipped with a 16 mm. 10x objective. In the studies which correlated dust exposure with asbestosis it was found that the incidence and severity of asbestosis increased with increasing dust exposure, and that those workers exposed to dust concentrations of less than 5 million particles per cubic foot (mppcf) did not develop asbestosis even after long-continued exposure. Because epidemiologic studies in the U. S. are based on the impinger method, this method has been adopted as a standard by those concerned with prevention of asbestosis. Using the impinger to evaluate effectiveness of environmental controls, it has been possible to notably reduce the incidence and severity of asbestosis.

In Great Britain a customary procedure in monitoring air in asbestos processing plants has been to count only the fibers collected in air samples. The thermal precipitator, Owens jet sampler and other instruments have been used for sampling, but the most common air sampling method at the present time is probably membrane filtration. After sampling, the filter is treated to render it transparent, and fibers are counted using a microscope equipped with a 2 mm. or 4 mm. objective. Fiber concentrations determined by these methods have not been compared to criteria developed in the U.S.A., because these fiber-counting methods do not yield results directly comparable to those obtained by the impinger sampling and counting method.

A study of being carried on Health Service. Departments. T membrane filter size and other cl only one aspect sampling to fiber microscope obje. It should be e pinger counts a being proposed presented, rather pinger counts t dication of the i membrane filter of better inform dust exposure.

Impinger

The impinger in silicosis-prodi of quartz and larger. The asac 10x objective to or 1 mm. depth minimum size. essentially the a equentialy by th gienists,⁵ the A Textile Institut sampling medi: may be used. In as the sampling pinger. When U plants, few asbe doubtedly been when all particle as fibers, the fib pinger dust cou methods reveal diameter — hund

8000 0994

80.29