RESPIRABLE ASBESTOS FIBERS

A number of questions arise regarding respirable asbestos fibers. What length of fiber is respirable? What is the particle-to-mass ratio? Should all fibers, whatever their length or diameter, be counted? If not, can any instrument be designed to select the right size distribution in the atmosphere?

Timbrell[219] has studied the deposition of fibrous material in the respiratory system. Fibers 50 or even 200 μ long are found in the lungs because the free-falling speed depends largely on the diameter. Thus, particles less than 3.5 μ (most asbestos particles are less than 0.5 μ) in diameter can possibly penetrate deeply into the lung. The more symmetrical a fiber is, the greater its chance of penetrating. The largest compact particles normally found in the lung are about 10 μ in diameter. Limitation on the lengths of the fibers which reach pulmonary air spaces is imposed by the nasal hairs and the small diameters of the respiratory bronchioles. These limitations are summarized in Table 23.

Respirable fibers have been defined by the British Occupational Hygiene Society[205] as fibers less than 200 μ long, less than 3.5 μ in diameter, and having a length-to-breadth ratio of 3:1. Only the fibers longer than 5 μ in length are counted.

PRODUCED BY FORD