

An evaluation of short-term exposures of brake mechanics to asbestos during automotive and truck brake cleaning and machining activities

Richter, R.O., **B.L. Finley, D.J. Paustenbach**, P.R.D. Williams, and P.J. Sheehan

Historically, the greatest contributions to airborne asbestos concentrations during brake repair work were likely due to specific, short-duration, dustgenerating activities. In this paper, the available short-term asbestos air sampling data for mechanics collected during the cleaning and machining of vehicle brakes are evaluated to determine their impact on both short-term and daily exposures. The high degree of variability and lack of transparency for most of the short-term samples limit their use in reconstructing past asbestos exposures for brake mechanics. However, the data are useful in evaluating how reducing short-term, dust-generating activities reduced long-term exposures, especially for auto brake mechanics. Using the short-term dose data for grinding brake linings from these same studies, in combination with existing time-weighted average (TWA) data collected in decades after grinding was commonplace in rebuilding brake shoes, an average 8-h TWA of approximately 0.10 f/cc was estimated for auto brake mechanics that performed arc grinding of linings during automobile brake repair (in the 1960s or earlier). In the 1970s and early 1980s, a decline in machining activities led to a decrease in the 8-h TWA to approximately 0.063 f/cc. Improved cleaning methods in the late 1980s further reduced the 8-h TWA for most brake mechanics to about 0.0021 f/cc. It is noteworthy that when compared with the original OSHA excursion level, only 15 of the more than 300 short-term concentrations for brake mechanics measured during the 1970s and 1980s possibly exceeded the standard. Considering exposure duration, none of the short-term exposures were above the current OSHA excursion level.

Keywords: Asbestos, Brake dust, Mechanics, Industrial hygiene, Short-term samples, Exposure assessment