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Asbestos and Brake Linings



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ASBESTOS AND BRAKE LININGS

The contribution of asbestos from brake lining wear to ambient air pollution is infinitesimal, even in urban areas, and is "an inconsequential health factor in urban air pollution."[1]

Brakes Rely On Asbestos

The use of high heat and friction resistant chrysotile asbestos in the manufacture of motor vehicle brake linings was developed in Great Britain in 1908. Today, more than 65 years later, no other material has been found which will provide the same degree of safe, dependable stopping performance as asbestos. Throughout the world, more than 300 million motor vehicles of all types—automobiles, trucks, buses—rely on asbestos-containing brake linings to bring them to safe, sure stops, time after time after time. While formulations vary considerably, an average automobile brake lining contains approximately 55 percent asbestos by weight, while the asbestos in a truck lining constitutes around 33 percent of the total.[1] Approximately 50,000 tons of asbestos is used in the manufacture of brake linings in the United States each year.[2]

Health Questions Arose

The inhalation of excessive quantities of asbestos fiber in occupational settings can cause respiratory disease and cancer. In the mid-sixties, speculation arose whether the gradual in service wear of asbestos-containing brake linings would release potentially harmful amounts of asbestos fiber into the ambient air. This concern was heightened by repeated findings of small amounts of asbestos fiber in the lungs of some city dwellers not known to have had occupational exposure to asbestos. While it is now generally recognized by the worldwide asbestos-health medical community that these small amounts of fiber do not constitute a hazard to the health of the general public,[3,4] the question still remained unanswered what contribution emissions from asbestos-containing brake linings made to urban air pollution. The results of research undertaken to answer this question are now available.

Natural Sources

Asbestos exists naturally in small though detectable amounts in serpentine rock formations throughout the world and is constantly being released into the atmosphere through erosion by wind and water. Asbestos is thus natural to our environment and—as analysis of dated ice from the polar caps have revealed—has been for thousands or even millions of years. Thus, the mere presence of asbestos in ambient air is not prima facie evidence of pollution from brake linings or other sources. For this reason, investigations into this question have had to be conducted either on specially equipped cars and trucks under actual driving conditions or in the laboratory on sophisticated brake testing dynamometers.

Emissions Not Significant

The results of three such research projects carried out over the past six years support the conclusion that emissions from brake lining wear are *not* a significant source of asbestos in the environment.[1,2,5] Some of the results of the three studies are summarized as follows:

- When brakes are applied, the high heat of friction converts more than 99 percent of the asbestos in the lining to a non-fibrous, non-toxic material called forsterite. The two most recent investigations showed conversion ratios of 99.7 percent[2] and 99.95 percent[5] respectively.
- Total airborne emissions of free asbestos fiber from brake lining wear amount to approximately 2½ tons each year for the entire United States.[2] This is less than one-half of one percent of the total particulate emissions in a city the size of Los Angeles in a single day!
- The calculated contribution of asbestos from brake lining wear to the air in a typical urban area is less than 0.07 nanograms per cubic meter of air (a nanogram is one-billionth of a gram).[5] Scientists estimate that asbestos fiber concentrations in urban areas average between 5-10 nanograms per cubic meter. It is therefore clear that "the wear of brake lining produces, at most, a small fraction of the asbestos fiber in urban air."[5]