

MEMORANDUM

Asbestos

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

TO : The Assistant Secretary for Health
Through: ES/PHS
Director, CDC

DATE: DEC 15 1976

FROM : Director, National Institute for
Occupational Safety and Health

PLAINTIFF'S EXHIBIT

HW-538

SUBJECT: Evaluation of Data on Health Effects of Asbestos Exposure and Revised
Recommended Numerical Environmental Limits

The National Institute for Occupational Safety and Health (NIOSH) recommend that occupational exposure to all types of asbestos be controlled so that no worker will be exposed to an airborne concentration of asbestos in excess of 100,000 fibers over 5 μ m in length per cubic meter on an 8-hour time-weighted average (TWA) basis. In addition, no worker will be exposed to peak concentrations in excess of 500,000 such fibers per cubic meter of air based on 15-minute sampling periods.

Previously, in a criteria document transmitted to the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, on January 21, 1972, NIOSH recommended that occupational exposure to asbestos be limited to 2,000,000 fibers over 5 μ m in length per cubic meter of air, determined as a time-weighted average exposure for an 8-hour workday, and to a peak concentration of 10,000,000 fibers over 5 μ m in length per cubic meter, determined by a minimum sampling time of 15 minutes. That recommended standard was designed primarily to prevent asbestosis. Recognizing that there was then insufficient information to establish a standard to prevent such other asbestos-related diseases as pulmonary, pleural, and peritoneal neoplasms, NIOSH had included in its calculations a safety factor intended to guard against neoplasms more adequately than unmodified environmental limits based solely on prevention of asbestosis. The current recommendation of a stricter standard was formed after review of both the most pertinent publications considered in the 1972 document and papers published during the four years since that document was transmitted to OSHA.

The recent literature reviewed has shown that the British standard of 2,000,000 fibers per cubic meter, adopted in 1969 and implemented in May of 1970, has not halted the development of radiographic abnormalities of the chest in workers in asbestos-using establishments. Another study has reported that miners exposed to fibers from amosite asbestos in airborne concentrations of less than 2,000,000 fibers per cubic meter (average concentration 250,000 fibers per cubic meter) have twice the likelihood of the general population of dying from either malignant or nonmalignant respiratory disease. Other papers have demonstrated that the risk of developing cancer after mixed exposure of factory workers to chrysotile, amosite, and crocidolite asbestos is dose-related.

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Furthermore, one paper reported that an excess mortality from lung cancer was found in 65 men who had been exposed to an unmeasured concentration of amosite asbestos for less than one month thirty years previously. The mortality rate was determined on an age-specific basis.

The present indications are that concentrations of asbestos fibers of 100,000 per cubic meter will occur rarely except in the asbestos-processing industry. Asbestos-containing fireproofing and anechoic linings of air-ducts and plenums, although they are possible sources of asbestos fiber, probably are not major polluters of air within buildings.

Currently it is not possible to establish a safe exposure level for the carcinogenic activity of asbestos. Therefore, the exposure values now recommended by NIOSH are based on what NIOSH considers to be the lowest concentration at which asbestos fibers can be monitored reliably using phase-contrast fiber counting procedures. After a thorough review and evaluation of all available sampling and analysis methods, NIOSH believes that phase-contrast microscopy is the only generally available and practical technique for routine monitoring at the recommended environmental limit.

The recommended TWA standard of 100,000 fibers greater than 5 μ m in length per cubic meter of air is intended to (1) protect against the noncarcinogenic effects of asbestos and (2) materially reduce the risk of asbestos-induced cancer. Because it is not possible to specify a safe exposure level for a carcinogen, only a ban on the use of asbestos can ensure complete protection against this mineral's carcinogenic effect. Therefore, emphasis should be placed on prohibiting the occupational use of asbestos in other than completely closed operations and on substituting other products whenever possible. Asbestos should be replaced, where technically feasible, by substitutes with the lowest possible chronic toxicities.

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