

It is important to note that coverage by this standard because an employee's asbestos exposure is "occupational" will not impose unnecessary requirements. In most cases where the source of "occupational exposure" is unrelated to the employer's operations, the only applicable requirement is to initially monitor the levels of exposure, set out in paragraph (d)(2) of this section. In most of these situations, the employer would not be required to monitor his employees exposures, rather he may estimate exposures using historical data or scientific expert opinion (d)(2)(iii). It is expected that building owners may be consulted to ascertain the identity, location and condition of asbestos products in their buildings. Although building owners, per se, do not incur any specific obligations under this standard, OSHA believes that they may be able to give reliable information concerning asbestos in some cases.

OSHA did not explore in detail the complex area of asbestos contamination in buildings because the available evidence shows that buildings containing even disturbed asbestos expose employees to levels considerably below the action level adopted in this standard (e.g. Alliance for Safe Building Brief to EPA, Ex. 311-D,E). Also other federal agencies, particularly EPA, are exploring in detail aspects of this problem (see EPA Docket Number OPTS-211012). For these reasons OSHA is not adopting specific regulatory language in this area and leaves open to evidence in enforcement proceedings whether "occupational exposure" is involved and whether the employer adequately applied the relevant provisions of this standard to protect occupationally exposed employees.

The two OSHA standards, general industry and construction concerning occupational exposure to asbestos, are intended to cover all industries covered by the Act. The general industry standard covers all activities and operations which are not covered by the construction standard. These industries and operations include ship repair and rebuilding, manufacturing, secondary processing, and brake and clutch repair. It should be noted that the applicability of the construction standard depends on the operations performed. Accordingly, if the employees of a manufacturer perform construction activities, their exposures are covered by the construction standard. As discussed in the preamble to the construction standard, construction activities are defined in 29 CFR 1910.12(b) as work for construction, alteration and/or repair, including painting and decorating.

Further, construction work is specifically defined to include, "the erection of new electric transmission and distribution lines and equipment, and the alteration, conversion and improvement of the existing transmission and distribution lines and equipment." 29 CFR 1910.12(d).

As noted above, ship repair and shipbreaking activities are covered by the general industry standard. OSHA believes the provisions of the general industry asbestos standard are appropriate for the operations involving asbestos which will occur on ships.

Automotive brake and clutch repair work is also covered by the general industry standard. Based on data submitted to the record it appears highly probable that most asbestos exposures for employees repairing and removing brake linings will be less than 0.1 f/cc on a TWA basis if employees use work practices and controls detailed in Appendix F (see Section XII). These controls mainly involve using a solvent mist on the linings or using HEPA-filtered vacuums to remove the dust. Therefore, although covered by this standard, no other requirements are expected to apply to brake and clutch repair employers.

2. Paragraph (b). Definitions.

Asbestos

OSHA raised two issues in the April proposal concerning the definition of asbestos. One issue was the addition of the phrase "and any of these minerals that has been chemically treated and/or altered" to the definition of asbestos. The other issue was the mineralogical "correctness" of the definition.

Some investigators have hypothesized that in addition to the physical characteristics of the fiber, the surface chemical properties account for part of its biological activity (Exs. 228, 227A). This hypothesis has led to research with the goal of reducing toxicity of asbestos by modifying the surface properties of the fiber.

Societe Nationale de l'Amiante (SNA), a Canadian company that mines and manufactures asbestos products, has been actively engaged in the chemical modification of chrysotile fibers. They have examined a number of possible reagents that might "passivate" (reduce the biological activity) chrysotile and have focused on the use of phosphorus gas to modify fibers (Ex. 338). Their process is a dry treatment using phosphorus oxychloride (POCl₃) gas, and the treated product is a phosphated chrysotile fiber which the SNA calls "chrysophosphate" (Exs. 228). The treated chrysotile has been compared with untreated chrysotile in *in vitro*

tests for hemolytic potential and the cytotoxic response of pulmonary macrophages. SNA reported that the treated chrysotile is less active in the tests than the untreated chrysotile (Ex. 228, 227). The treated chrysotile is currently being tested in longterm bioassays where animals are exposed to the material through inhalation and injection (Ex. 338).

At the hearing, Mr. Richard Lemen of NIOSH indicated that the results of the *in vitro* testing did not provide adequate data upon which to base any decision to exclude chemically treated asbestos from the standard (Tr. 6/21, p. 188). Dr. Arthur Langer, who has performed some of the *in vitro* testing on the chemically modified chrysotile, agreed that longterm bioassays are needed, and he called for additional *in vitro* testing and for tests to determine the stability of the chemically altered structure (Tr. 7/3, p. 97). Although Dr. Langer clearly stated that modified asbestos fibers should be regulated by the standard, he went on to state that "[t]he modification of asbestos should be viewed as an important factor in risk reduction in the future" (Ex. 220).

In his testimony at the hearing, Mr. Mark Lalancette of SNA acknowledged the need for continuing regulation of chemically treated asbestos (Tr. 7/5, p. 9). The SNA did not request that OSHA exclude phosphated chrysotile from the definition of asbestos, but requested that OSHA indicate that this particular modification of the definition be regarded as "only an interim measure designed to clarify the regulation's scope until full toxicological data are available to make distinctions" (Ex. 338). The SNA requested that OSHA "be receptive to reviewing such toxicology data when they are developed to determine the extent to which standard revisions are appropriate, given such new knowledge," (Ex. 338) a request echoed by the Asbestos Information Association (Ex. 328 p. 1-33).

Although the reports of *in vitro* testing are encouraging, they provide only a small portion of the information necessary to evaluate chemically modified asbestos. The Agency does not wish to discourage research that may lead to a reduction in risk from occupational exposure to asbestos, and any data that support a reduction in risk can be submitted to the Agency at any time. However, there is considerable evidence that documents the carcinogenicity of asbestos and considerable evidence will be required to document any claims of reduced toxicity of chemically modified asbestos. Therefore, based on the data in the record and the testimony of expert