

OSHA has decided to issue two separate standards regulating occupational exposure to asbestos, tremolite, anthophyllite, and actinolite: One that applies to workplaces in general industry (including maritime) and another covering construction worksites. In promulgating two separate standards for general industry and construction, OSHA is acting in accordance with the recommendations of the Advisory Committee for Construction Safety and Health (CACOSH), which has reviewed and commented on several versions of the new standard in the construction industry, most recently during CACOSH's deliberations on October 17, 1985, in Washington, DC. These standards will be codified at 29 CFR 1910.1001 for general industry and at 29 CFR 1926.58 for the construction industry. OSHA has developed separate standards for these two industry groupings in recognition of the vastly different conditions prevailing in the workplaces covered by general industry and construction standards. As the April 1984 notice pointed out (49 FR 14127 et seq.), OSHA's existing asbestos standard (29 CFR 1910.1001) was more suitable for fixed-site manufacturing workplaces and a workforce composed of long-term employees, rather than for the short-term projects and highly mobile workforce characteristic of the construction industry.

Support for a separate OSHA standard for construction came from all interested parties in this rulemaking, including the Building and Construction Trades Department (BCTD) of the AFL-CIO (Ex 87-2); CACOSH (Ex. 84-424); the Asbestos Information Association (EX. 84-307); the Associated General Contractors of America (AGC) (Ex. 84-457); The Safe State Program, University of Alabama (Ex. 601.X); and the AFL-CIO Steering Committee on Safety and Occupational Health (Ex. 606.X). These commenters supported separate standards for these two industry groupings because employee exposures to asbestos, tremolite, anthophyllite, and actinolite, appropriate methods of controlling exposures, and prevailing workplace conditions are substantially different in workplaces in construction and general industry.

Although the Summary and Explanation section of the preamble for the construction industry (Section XI of the preamble) discusses the record evidence as it applies to specific provisions of the final rule for construction, the reasons given by these commenters in support of a separate

standard for construction can be summarized briefly as follows:

(1) The construction industry is characterized by non-fixed worksites that are temporary in nature and differ from those in general industry in regard to site conditions, size and scope of tasks, methods of operation, and environmental conditions.

(2) Employees in the construction industry often do not remain in construction or in the employ of the same employer for a long period of time, in contrast to employees in fixed-site manufacturing facilities.

(3) The unique characteristics of construction operations may make it necessary to tailor some of the requirements traditionally included in OSHA health standards to the specific needs of the construction industry.

OSHA finds merit in these arguments, and in response to the nearly unanimous support for separate standards for general industry and construction, the Agency is issuing separate final rules covering these respective workplaces. In addition, OSHA has tailored the requirements of the final construction standard to reflect differences in operations of various types within the construction industry itself. The record demonstrated these intra-industry differences in construction exposure and work conditions by pointing to the generally low exposures and well-controlled conditions prevailing in construction operations involving the installation of new asbestos-containing products and comparing them with those typical of major demolition, renovation, and asbestos removal construction operations. In recognition of this wide diversity in construction projects, the Agency has specifically identified in the final rule those additional requirements that apply to construction operations involving asbestos abatement activities. Requirements governing these potentially high-hazard operations are grouped separately in the construction standard under a heading clearly labeled "for removal, demolition, and renovation operations." For example, paragraphs (i)(1) through (i)(3) of the standard are grouped under the title "Protective clothing" and apply to all construction operations other than removal, demolition, and renovation operations, while paragraph (i)(4) is titled "Protective clothing for asbestos removal, demolition, and renovation operations" and applies only to such operations. Similarly, paragraphs (e)(1) through (e)(5) contain OSHA's requirements for regulated areas on construction projects other than removal, demolition, and renovation

operations, while paragraph (e)(6) specifies the more extensive and stringent requirements for the enclosed negative-pressure regulated areas required for removal, demolition, and renovation operations. OSHA believes that tiering the construction standard to reflect differences in workplace conditions within this industry will simultaneously provide appropriate employee protection and encourage voluntary employer compliance with the final rule.

In publishing these two revised standards governing occupational exposure to asbestos, tremolite, anthophyllite, and actinolite in construction and in general industry, OSHA is acting to regulate a hazard widely recognized by other Federal agencies, health experts, and the general public. The U.S. Environmental Protection Agency (EPA) has promulgated regulations controlling asbestos under the Clean Air Act, the Toxic Substances Control Act, and the Clean Water Act. Under section 6 of the Toxic Substances Control Act (TSCA), EPA is proposing to prohibit the manufacture, importation, and processing of asbestos-cement pipe and fittings, roofing felts, flooring felts (and felt-backed sheet flooring), vinyl-asbestos floor tile, and asbestos clothing (51 FR 3738-3759). These uses would be prohibited because EPA believes that safer, economically competitive substitutes for these products are available, and that "the manufacture, processing, and use of asbestos products leaves a legacy of asbestos in the ambient air" (51 FR 3739).

In addition, EPA is proposing to establish a permit system to phase out all other asbestos products. Under this system, EPA would permit current miners or importers to mine or import a specific quantity of asbestos. EPA would require this quantity to decline every year until, after 10 years, mining or importation would only be permitted under a specific exemption for those asbestos applications for which no substitutes had been developed. EPA is also considering requiring labeling for all asbestos products that are not banned, including products manufactured pursuant to permits issued by EPA during the phase-down period, or pursuant to an exemption process.

Emissions of asbestos to the ambient air are controlled under section 112 of the Clean Air Act, which establishes National Emissions Standards for Hazardous Air Pollutants. Regulations in 40 CFR Part 61, Subpart M, specify control requirements for most asbestos

emissions, including work practices that must be followed to minimize the release of asbestos fibers during the handling of asbestos waste materials. EPA regulations promulgated under the Toxic Substances Control Act (40 CFR Part 763, Subpart F) address the problem of asbestos construction materials used in schools. These regulations require that all schools be inspected to determine the presence and quantity of asbestos-containing materials in school facilities. Corrective actions are left to the discretion of school officials. EPA regulations promulgated under the Clean Water Act set standards for asbestos levels in effluents to navigable waters.

Throughout this rulemaking, OSHA has consulted with the EPA on various regulatory aspects of dealing with the asbestos hazard. EPA has reviewed and critiqued OSHA's quantitative risk assessment for asbestos (Exs. 84-292, 86-8), and both EPA and OSHA belong to the Federal Asbestos Task Force, established in June 1983, to coordinate Federal regulatory actions with regard to asbestos. The Consumer Product Safety Commission is also a member of this task force because of its mandate to protect consumers from health and safety hazards.

C. State Plan Revisions

The 25 states and territories with their own OSHA-approved occupational safety and health plans must revise their existing standard within 6 months of this publication date or show OSHA why there is no need for action; for example, because an existing State standard covering this area is already "at least as effective" as the revised Federal standards. These states or territories are: Alaska, Arizona, California, Connecticut, Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, New York, North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, the Virgin Islands, Washington, and Wyoming. (In Connecticut and New York, the plan covers only State and local government employees.)

II. Regulatory History

OSHA has regulated asbestos since 1971. A 12 f/cc permissible exposure limit (PEL) for asbestos was included in the initial promulgation on May 29, 1971 (36 FR 10466) of OSHA standards pursuant to Section 6(a) of the Act. In Response to a petition by the Industrial Union Department of the AFL-CIO, OSHA issued an ETS on asbestos on December 7, 1971, which established a PEL of 5 f/cc as an 8-hour time-weighted

average (TWA) and a peak exposure level of 10 f/cc.

In June 1972, OSHA promulgated a new final standard that established an 8-hour time-weighted average PEL of 5 f/cc and a ceiling limit of 10 f/cc. These limits were intended primarily to protect employees against asbestosis, and it was hoped that they would provide some incidental degree of protection against asbestos induced forms of cancer. Effective July 1976, OSHA's 8-hour TWA limit was reduced to 2 f/cc and this limit remained in effect up to the present; the final rules published today revise the PEL for 8-hour employee exposures to asbestos, tremolite, anthophyllite, and actinolite to a level of 0.2 fiber/cc.

OSHA's 1972 asbestos standard was reviewed by the court and upheld in all major respects; however, the court remanded two issues for OSHA's reconsideration (*UD v. Hodgson*, 449 F. 2d 467 (CA DC 1974)). These issues were whether the July 1976 effective date for the 2 f/cc standard should be accelerated for some industries and whether the standard's 3-year retention period for employee exposure monitoring records was adequate. In response to the remand, OSHA increased the record retention period to 20 years (41 FR 11504), and the passage of time mooted the acceleration issue.

In October 1975, OSHA published a notice of proposed rulemaking (40 FR 47652) to revise the asbestos standard because the Agency believed that "sufficient medical and scientific evidence has been accumulated to warrant the designation of asbestos as a human carcinogen" and that advances in monitoring and protective technology made reexamination of the standard "desirable." This proposal would have reduced the 8-hour time-weighted average to 0.5 f/cc and imposed a ceiling limit of 5 f/cc for 15 minutes.

The basis for the 1975 proposal's reduction in the permissible exposure limit to 0.5 f/cc was OSHA's then-current policy for carcinogens that assumed that no safe threshold level was demonstrable and therefore that the Act required the Agency to set the PEL at a level as low as technologically and economically feasible. This policy was rejected by the Supreme Court in the benzene decision (*UD v. API*, 448 U.S. 601 (1980)) (see the discussion of the implications of the benzene decision for OSHA rulemaking in the Significance of Risk section of the preamble, section VI). The 1975 proposal would have applied to all industries except construction. Further, although OSHA announced its intention to develop a

separate proposal applicable to the construction industry, no such proposal was published.

In 1976, the National Institute for Occupational Safety and Health (NIOSH), and in 1980 a NIOSH/OSHA task force, recommended that OSHA reduce the permissible exposure limit for asbestos to 0.1 f/cc, based on evidence of the carcinogenicity of asbestos (Ex. 84-320). OSHA has considered these recommendations in determining what regulatory response is necessary to provide exposed employees with effective protection.

On May 24, 1983, OSHA consulted with the Advisory Committee for Construction Safety and Health (referred to as "CACOSH") concerning the applicability of any new asbestos standard to the construction industry. CACOSH endorsed OSHA's position that any new PEL adopted for general industry should also apply to the construction industry (Ex. 84-424). On November 4, 1983, OSHA published an Emergency Temporary Standard (ETS) for asbestos (48 FR 51086). The ETS marked a new regulatory initiative, related to, but not part of, the 1975 proceeding. The ETS was held invalid by the U.S. Circuit Court of Appeals for the Fifth Circuit on March 7, 1984.

Subsequently, OSHA published a notice of proposed rulemaking (49 FR 14116, April 10, 1984) for a standard covering occupational exposure to asbestos in all of the industries governed by the Act: maritime, construction, and general industry. Pursuant to Section 6(c) of the Act, the ETS also served as a proposed rule. Public hearings were held in Washington, D.C., from June 19 to July 10, 1984, to provide interested parties and the public with the opportunity to comment on the proposed revisions, pursuant to notice and section 6(b) of the Act (29 U.S.C. 655(b)(3)). The hearings were presided over by Administrative Law Judge Robert G. Mahoney. Post-hearing submissions of data, comments, and briefs were received through November 1, 1984. The entire record, including over 340 exhibits and approximately 55,000 pages of material, was certified by Judge Mahoney on September 27, 1985, in accordance with 29 CFR 1911.17. Copies of materials contained in the record may be obtained from the OSHA Docket Office, Room N3670, U.S. Department of Labor, 200 Constitution Avenue, NW., Washington, DC 20210. These final standards on occupational exposure to asbestos in construction and general industry are based on a thorough consideration of the entire record of this

proceeding, including materials discussed or relied on in the November 1983 and April 1984 notices, the record of the informal hearing, and all written comments and exhibits received.

III. Pertinent Legal Authority

The primary purpose of the Occupational Safety and Health Act (29 U.S.C. 651 et seq.) (the Act) is to assure, so far as possible, safe and healthful working conditions for every American worker over the period of his or her working lifetime. One means prescribed by the Congress to achieve this goal is the mandate given to, and the concomitant authority vested in, the Secretary of Labor to set mandatory safety and health standards. The Congress specifically mandated that:

The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life. Development of standards under this subsection shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of standards, and experience gained under this and other health and safety laws. (Section 6(b)(5))

Where appropriate, OSHA standards are required to include provisions for labels or other appropriate forms of warning to apprise employees of hazards, suitable protective equipment, exposure control procedures, monitoring and measuring of employee exposure, employee access to the results of monitoring, appropriate medical examinations, and training and education. Moreover, where a standard prescribes medical examinations or other tests, they must be available at no cost to the employee (Section 6(b)(7)). Standards may also prescribe recordkeeping requirements where necessary or appropriate for the enforcement of the Act or for developing information regarding occupational accidents and illnesses (Section 6(c)).

In vacating OSHA's revision to its benzene standard, the Supreme Court required in *Industrial Union Department, AFL-CIO v. American Petroleum Institute*, 448 U.S. 801, 65 L. Ed. 2d 1010, 100 S. Ct. 2844 (1980), that before the issuance of a new or revised standard pursuant to section 6(b)(5) of the Act, OSHA must make two

threshold findings. OSHA must find that a significant risk exists under the current standard and that the issuance of a new standard would reduce or eliminate that risk. The Court stated:

We agree . . . that subsection 3(8) requires the Secretary to find, as a threshold matter, that the toxic substance in question poses a significant health risk in the workplace and that a new, lower standard is therefore "reasonably necessary or appropriate to provide safe and healthful employment and places of employment." 448 U.S. 807 at 814-15; 65 L. Ed. 2d 1010 at 1018-19.

The Court also stated:

. . . Before he can promulgate any permanent health or safety standard, the Secretary [of Labor] is required to make a threshold finding that a place of employment is unsafe—in the sense that significant risks are present and can be eliminated or lessened by a change in practices. . . . (448 U.S. at 842, 65 L. Ed. 2d at 1035)

The decision, although it recognized the uncertainties involved, indicated that the determination of "significant risk" should, if at all possible, be established on the basis of an analysis of the best available evidence through such means as quantitative risk assessments. However, in making that determination, the Supreme Court in its general guidance for the future noted that

. . . The requirement that a "significant" risk be identified is not a mathematical straitjacket. It is the Agency's responsibility to determine, in the first instance, what it considers to be a "significant risk." (448 U.S. at 855, 65 L. Ed. 2d at 1043)

It pointed out that while OSHA

. . . must support its findings that a certain level of risk exists by substantial evidence, we recognize that its determination that a particular level of risk is "significant" will be based largely on policy considerations. (448 U.S. at 856, 65 L. Ed. 2d at 1043, n. 82)

Finally, the Court pointed out that

. . . OSHA is not required to support its finding that a significant risk exists with anything approaching scientific certainty.

Although the Agency's findings must be supported by substantial evidence . . . OSHA [has] some leeway where its findings must be made on the frontiers of scientific knowledge. (448 U.S. at 856, 65 L. Ed. 2d at 1043)

In the only concrete example of significance, the Court stated:

Some risks are plainly acceptable and others are plainly unacceptable. If, for example, the odds are one in a billion that a person will die from cancer by taking a drink of chlorinated water, the risk clearly could not be considered significant. On the other hand, if the odds are one in a thousand that regular inhalation of gasoline vapors that are 2% benzene will be fatal, a reasonable person

might well consider the risk significant and take appropriate steps to decrease or eliminate it. (Id. at 855, 65 L. Ed. 2d at 1043.)

After OSHA has determined that a significant risk exists and that such risk can be reduced or eliminated by the proposed standard, it must set the standard "which most adequately assures, to the extent feasible on the basis of the best available evidence, that no employees will suffer material impairment of health . . ." (section 6(b)(5) of the Act). The Supreme Court has interpreted this section to mean that OSHA must enact the most protective standard possible to eliminate a significant risk of material health impairment, subject only to the constraints of technological and economic feasibility. (*American Textile Manufacturers Institute, Inc. v. Donovan*, 452 U.S. 490 (1981)).

Moreover, section 4(b)(2) of the Act provides for OSHA standards to apply to construction, maritime, and other workplaces where the Secretary determines that these standards are more effective than the existing standards that would otherwise apply to these workplaces. The Secretary so finds, and these standards will therefore apply to all workplaces where the Secretary has authority to regulate.

IV. Health Effects

A. Overview of Asbestos-Related Diseases

OSHA is aware of no instance in which exposure to a toxic substance has more clearly demonstrated detrimental health effects on humans than has asbestos exposure. The diseases caused by asbestos exposure are life-threatening or disabling. Among these diseases are lung cancer, cancer of the mesothelial lining of the pleura and peritoneum, asbestosis, and gastrointestinal cancer. Of all of the diseases caused by asbestos, lung cancer constitutes the greatest health risk for American asbestos workers. Lung cancer has been responsible for more than half of the excess mortality from asbestos exposure in some occupational cohorts.

The relationship between lung cancer and asbestos exposure has been established in numerous epidemiologic studies of diverse groups. Asbestos-induced lung cancer usually has a latency period in excess of 20 years, and this cancer may be manifested at a younger age than is true for lung cancer victims who are not exposed to asbestos (Craighead et al., Ex. 84-033). Few cases of lung cancer are curable, despite advances in medical and surgical

witnesses. OSHA has concluded that chemically modified asbestos should be regulated in the same manner as unmodified asbestos. To make this intent clear, the phrase "and any of these minerals that has been chemically treated and/or altered" has been added to the definition of asbestos.

OSHA currently regulates all forms of tremolite, actinolite, and anthophyllite as asbestos. Some commenters, most notably representatives of the R.T. Vanderbilt Company, have strongly encouraged OSHA to revise its definition of asbestos to make it mineralogically correct. They have encouraged the Agency to amend the definition to make it clear that only the "asbestiform" varieties of tremolite, anthophyllite, and actinolite are considered to be asbestos (Ex. 337). The Agency raised this issue in the April proposal.

A number of commenters supported the addition of the term "asbestiform" (Ex. 90-3; 90-143; 90-180) or the term "fibrous" (Ex. 90-37; 117A) to the definition. Some urged OSHA to adopt the definition of another governmental Agency (Ex. 90-143; 90-161; 90-167) or to adopt a mineralogical definition (Ex. 90-37; 90-162; 90-179; 230 p. 13).

The modification of the definition to read tremolite asbestos, anthophyllite asbestos, and actinolite asbestos would eliminate other forms of tremolite, anthophyllite and actinolite from the definition of asbestos. OSHA has regulated all of these minerals as asbestos since 1972. The elimination of these minerals from the scope of the standard could only be justified by evidence that exposure to these minerals would not present a health hazard to exposed workers. Therefore, in its deliberations, OSHA examined the data in the record to determine whether or not there is evidence that workers exposed to these minerals are at risk for adverse health effects.

Both Dr. Mearl Stanton and Dr. William Smith have investigated the carcinogenicity of tremolite in experimental animals. Dr. Stanton's experiments (Ex. 84-195) demonstrated that tremolite asbestos is highly carcinogenic when implanted in the pleurae of rats. He also tested two samples of talc that did not induce tumors. These two samples were certified by Dr. Ann Wylie (Ex. 337 Att 2) to be tremolitic talcs which "usually contain approximately 30-50% nonasbestiform tremolite by weight, and small quantities of nonasbestiform anthophyllite and fibrous talc" (Ex. 337 Att 2). Dr. William Smith also conducted a series of experimental carcinogenicity studies in hamsters (Ex. 84-194; 306).

These studies examined the effect of intrapleural injections of a number of minerals including asbestiform and nonasbestiform tremolite. In these studies, samples of asbestiform tremolite and a sample of nonasbestiform tremolite induced tumor formation in hamsters while other samples of nonasbestiform tremolite did not (Ex. 84-194).

In addition to the experimental animal studies, much of the support to eliminate some forms of tremolite, actinolite, and anthophyllite from the definition of asbestos has focused on epidemiological studies of exposed workers. Particular attention has been paid to two prospective mortality studies at a New York state talc mine and mill. The November proposal discussed both studies in great detail.

Briefly, the NIOSH investigators (Brown, Dement and Wagoner Ex. 84-25) concluded that there were significant excesses of lung cancer mortality and of mortality due to nonmalignant respiratory disease. In the opinion of the investigators, this increase could not be accounted for by smoking history alone. They also reported that asbestos was present in the mine and mill. Stille and Tabershaw, studying a larger cohort employed at the same facility, concluded that the lung cancer excess observed was not statistically significant and was "consistent with a smoking effect" (Ex. 84-196). A number of reports, analyses, and letters to the editor that discussed the strengths and shortcomings of the two studies were placed in the record and were discussed in the November proposal (Exs. 84-217; 84-218; 84-231; 84-257; 84-375, 308, 337). (For a detailed discussion see 48 FR 51117-51120.)

Several other authors have investigated the mortality and morbidity associated with anthophyllite and tremolite exposures. Studies by Kleinfeld *et al.* (Ex. 84-181), Kiviluoto *et al.* (Ex. 84-181), Gamble *et al.* (Ex. 84-181) and others were discussed in the November proposal. In general, these studies have found an excess mortality and/or morbidity associated with exposures to these minerals.

OSHA has examined the data in the record that addresses the relationship between the health of workers and exposure to tremolite, actinolite and anthophyllite. There is epidemiological evidence in the record that shows that tremolite exposed workers are at risk for both death and disease. The results in experimental animals indicate that under test conditions that some samples of nonasbestiform tremolite induce tumor formation while others do not. Therefore, OSHA concludes that

exposure to all forms of tremolite, anthophyllite and actinolite should be regulated under this standard.

The Agency recognizes that the minerals tremolite, actinolite and anthophyllite exist in different forms. Further, the Agency has concluded that all forms of these minerals should continue to be regulated for the reasons stated above. Therefore, OSHA is amending the definition of asbestos in recognition that different mineral forms exist and adding a definition for tremolite, anthophyllite and actinolite to make it clear that all of the mineral forms come under the scope of the standard.

Action Level

In the final standard the action level has been set at 0.1 f/cc which triggers the monitoring, medical, and employee information and training requirements. This level is consistent with the trigger currently applied to the medical surveillance provision of the asbestos standard, so it represents no real change to the standard with regard to this provision, but merely clarifies OSHA's policy. This provision is also consistent with other OSHA health standards which trigger monitoring, medical, and training requirements at the action level (e.g., arsenic, 1910.1018; lead, 1910.1025; acrylonitrile, 1910.1045; and ethylene oxide 1910.1047). Regulated areas, hygiene facilities, and protective clothing are triggered at the PEL, consistent with past OSHA rulemaking. [See, for example, inorganic arsenic, 1910.1018].

Representatives of industry, labor and government endorsed the action level concept. Many participants suggested that a 0.1 f/cc action level should be maintained as an appropriate level for the implementation of medical surveillance [Exs. 86-4, 90-49, 90-163, 90-174, 90-180, 158D, 328]. Some commenters were of the opinion that the 0.1 level should trigger implementation of other provisions as well, such as training [Exs. 86-4, 90-49, 90-163, 90-174, 90-180, 158D, 328]. Some commenters were of the opinion that the 0.1 level should trigger implementation of other provisions as well, such as training [Exs. 86-4, 292, 328], regulated areas [Exs. 86-4, 90-49, 292], monitoring [86-4, 292, 328], hygiene facilities and protective clothing requirements [Exs. 86-4, 292]. Other industry spokespersons believed that the action level was overly burdensome, stating their opinion that if the permissible exposure level were a level that adequately protects workers, no action level should be required [Exs. 90-138, 90-166, 90-168].

potential safety and health problems involves the cooperation of employees, the success of such a program is highly dependent upon the employee's understanding of the hazards attendant to that job.

Finally, given the evidence of the carcinogenicity of asbestos, OSHA believes that these signs will not cause undue alarm. This is especially so when balanced against the positive results anticipated, as described above. For all of the reasons set forth OSHA believes that it is appropriate to use precautionary signs which warn of a cancer hazard.

The standard also requires that all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, or their containers, be labeled with the appropriate information:

DANGER—CONTAINS ASBESTOS FIBERS; AVOID CREATING DUST; CANCER AND LUNG DISEASE HAZARD

The new standard allows two exceptions to the labeling and material safety data sheets (MSDS) requirements: no label or MSDS is required in those instances where: (1) Asbestos fibers have been modified by a bonding agent, coating, binder, or other material, provided that the manufacturer can demonstrate that during any reasonably foreseeable use (including handling, storage, disposal, processing, or transportation) employee exposure will remain below the action level; or (2) asbestos is present in a product in concentrations less than 0.1%. The exceptions provided in the revised standard are based, in part, on the exception given in the existing standard and are consistent with guidance provided in OSHA's Hazard Communication standard (1910.1200).

The existing asbestos standard provides that

... no label is required where asbestos fibers have been modified by a bonding agent, coating, binder, or other material so that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers in excess of the exposure limits provided in paragraph (b) [PEL] of this section will be released [1910.1001(g)(2)(i)].

This is changed slightly in the revised rule so that airborne concentrations must be kept below the action level rather than the PEL.

As discussed earlier, an action level has been added to this rule to trigger a number of provisions, such as medical surveillance and monitoring, in part, because OSHA feels exposures at the action level may still pose significant

risk to workers, and so keeping exposures below this level is important for worker protection. Therefore, OSHA has changed the exception to the labeling requirement to be consistent with the introduction of an action level in the revised rule. It is OSHA's belief that materials that have been treated in the manner described in the exception (such as bonding or coating) would not generally release airborne concentrations of asbestos above the action level, and that the change in the regulatory language should not impose any additional obligations upon employers exempt under the existing rule.

OSHA has added another exception to labeling, for materials containing less than 0.1% asbestos. The exception was added in response to concerns expressed by a number of participants that asbestos is a trace contaminant in a number of materials and products (see, for example, Grace, Ex. 344-16) and that labeling such products would constitute an undue burden on employers. In choosing the percent exemption, OSHA has taken general guidance from its Hazard Communication rule which specifies that a mixture shall be considered hazardous if a carcinogen is present in concentrations in excess of 0.1% [1910.1200(d)(5)(iv)]. While other percentages were suggested to the record (for example, 0.25%, Ex. 344-16), OSHA found no other data to override considerations of safety given in the generic standard and, hence, in the interest of the protection of worker health, has maintained the 0.1% recommendation.

The signs and labels requirements discussed above are consistent with Section 6(b)(7) of the OSH Act, which prescribes the use of labels or other appropriate forms of warning to apprise employees of the hazards to which they are exposed. Rulemaking participants generally supported OSHA's requirement for signs and labels. [Exs. 146, 233, 236, 312, 88-4, 90-174, 92-38]. There were no significant issues raised to the contrary.

Information and Training

The final standard requires employers to provide a training program for all employees expected to be exposed to airborne asbestos at or above the action level of 0.1 f/cc. The training requirement in the standard is patterned after OSHA's Hazard Communication standard [29 CFR 1910.1200(h) (1) and (2)].

Information and training are to be provided at the time of initial assignment and at least annually to employees who are exposed to airborne

concentrations of asbestos at or above the action level. The content of the training program is intended to inform employers of: (1) The hazards to which they are exposed; (2) the necessary steps to protect themselves, including those to be taken during emergency situations; (3) the proper use and limitation of respirators and protective equipment; (4) a description of medical examinations and their purpose; (5) implementation of work practices and the use of available engineering controls; (6) the contents of this standard and (7) the added risk of lung cancer due to the combination of cigarette smoking and asbestos exposure. Section 6(b)(7) of the Act makes it clear that these are appropriate goals for an employee training program, and the final standard includes such provisions.

The employer is required to make a copy of the standard available to affected employees and their representatives. This requirement, in combination with the review provided for as part of the training program, is intended to ensure that employees understand their rights and duties under this standard.

The employer is also required to provide, upon request, all materials relating to the training program to the Assistant Secretary and Director. This is intended to provide an objective check of compliance with the requirements under this paragraph.

OSHA recognizes that asbestos may be only one of a number of substances to which an employee may be exposed simultaneously in the workplace. The education and training requirements in this standard contain those elements OSHA has determined to be basic. The format and content of the required training and information program are neither rigid nor extensive. An employer may, if desired, incorporate the required information for asbestos into an existing program of training and education to be provided to employees.

The final standard requires that the training program be provided at least annually. OSHA believes that an annual training program is both necessary and sufficient to ensure that employees maintain a continuing awareness of the hazards of asbestos and their rights and duties under the standard.

To increase the effectiveness of training goals the final standard requires that the training material be made available, without cost, to all affected employees or their representatives.

The final training provision is virtually identical to that proposed, except that the requirement is triggered

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Parts 1910 and 1926

(Docket No. H-033C)

Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite

AGENCY: Occupational Safety and Health Administration, U.S. Department of Labor.

ACTION: Final rules.

SUMMARY: In these final standards, the Occupational Safety and Health Administration (OSHA) amends its present standard (29 CFR 1910.1001) regulating occupational exposure to asbestos. The standards published today establish a permissible exposure limit of 0.2 fiber per cubic centimeter of air (f/cc), determined as an 8-hour time-weighted average airborne concentration. The standards apply to all industries covered by the Occupational Safety and Health Act, including the construction and maritime industries and general industry. Separate standards and separate statements of reasons (Summary and Explanation sections) have been developed to apply to general industry (including maritime) and to construction, because the differences in exposure and workplace conditions in general industry and construction worksites warrant separate treatment. The standards will be codified in 29 CFR Parts 1910 and 1926, OSHA's General Industry and Construction standards, respectively. The basis for promulgation of these regulations is a determination by the Assistant Secretary that employees exposed to asbestos, tremolite, anthophyllite, and actinolite face a significant risk to their health and that these final standards will substantially reduce that risk. The record in this rulemaking demonstrates that employees occupationally exposed to asbestos are at risk of developing such chronic diseases as asbestosis, lung cancer, pleural and peritoneal mesothelioma, and gastrointestinal cancer.

The standards also provide for requirements for methods of compliance, personal protective equipment, employee monitoring, medical surveillance, communication of hazards to employees, regulated areas, housekeeping procedures, and recordkeeping. An "action" level of 0.1 f/cc as an 8-hour time-weighted average is established as the level above which

employers must initiate certain compliance activities, such as employee training and medical surveillance. Where the employer can demonstrate, by means of exposure monitoring results or historical data, that the exposures of his or her employees do not exceed the action level, the employer is not obligated to comply with many of the standard's requirements. The 0.2 f/cc 8-hour limit reduces significant risk from exposure and is considered by OSHA, based upon substantial evidence in the record as a whole, to be the lowest level feasible.

EFFECTIVE DATE: The amended standards published today take effect July 21, 1986, except the following paragraphs which contain information collection requirements which are under review at the Office of Management and Budget: 29 CFR 1910.1001 (d)(2), (d)(3), (d)(5), (d)(7), (f)(2), (g)(3)(i), (j)(5), (l), and (m); 29 CFR 1926.56 (f)(2), (f)(3), (f)(6), (h)(3)(i), (k)(3), (k)(4), (m), and (n).

ADDRESS: For additional copies of these final standards, contact: OSHA Office of Publications, U.S. Department of Labor, Room S-4203, 200 Constitution Avenue, NW., Washington, DC 20210. Telephone (202) 523-6667.

FOR FURTHER INFORMATION CONTACT: Mr. James F. Foster, Director, Office of Information and Consumer Affairs, OSHA, U.S. Department of Labor, Room N-3637, 200 Constitution Avenue, NW., Washington, DC 20210. Telephone (202) 523-8151.

SUPPLEMENTARY INFORMATION:**I. Introduction****A. The Format of This Document (the Preamble)**

The preamble accompanying these revised standards is divided into 13 parts, numbered I through XIII. The following is a table of contents:

- I. Introduction
- II. Regulatory History
- III. Pertinent Legal Authority
- IV. Health Effects
- V. Quantitative Risk Assessment
- VI. Significance of Risk
- VII. Final Economic Impact, and Regulatory Flexibility Analysis
- VIII. Environmental Impact Assessment
- IX. Standards Recommended to OSHA by Interested Parties
- X. Summary and Explanation of the Revised Standard for General Industry
- XI. Summary and Explanation for a Revised Standard for the Construction Industry
- XII. Authority and Signature
- XIII. Amended Standards

References to the rulemaking record are in the text of the preamble, and the following abbreviations have been used:

1. Ex.: Exhibit number in Docket H-033C. Docket H-033C is located in Room N3670 at the Department of Labor.

2. TR.: Transcript date and page number.

B. Summary

Pursuant to sections 4(b)(2), 6(b), 6(c), and 8(c) of the Occupational Safety and Health Act of 1970 (the Act) (84 Stat. 1562, 1563, 1566, 1569; 29 U.S.C. 653, 655, 657), the Construction Safety Act (40 U.S.C. 333), the Longshoremen's and Harbor Workers' Compensation Act (33 U.S.C. 941), the Secretary of Labor's Order No. 9-83 (48 FR 35736), and 29 CFR Part 1911, these final standards hereby amend and revise the current asbestos standard, 29 CFR 1910.1001.

This action follows publication of proposed notices on November 4, 1983 (48 FR 51085) and on April 10, 1984 (49 FR 14116) and the holding of a public hearing to provide the public with an opportunity to comment on these proposed revisions. The hearings were held from June 19 to July 10, 1984, in Washington, DC. More than 55,000 pages of testimony and comments were received into the record of this rulemaking and have been analyzed by the Agency in developing these final standards. Based on this record, OSHA has determined that employees exposed to asbestos, tremolite, anthophyllite, and actinolite at the existing permissible exposure limit (PEL) of 2 fibers per cubic centimeter of air (2 f/cc) at worksites in the construction and maritime industries and in general industry workplaces face a significant risk to their health and that these final standards will substantially reduce that risk. Evidence in the record of this proceeding has shown that employees exposed at the revised standards' PEL of 0.2 fiber/cc remain at significant risk of incurring a chronic exposure-related disease, but considerations of feasibility have constrained OSHA to set the revised PEL at the 0.2 fiber/cc level.

The standard issued in 1971 defined asbestos as chrysotile, crocidolite, amosite, tremolite, anthophyllite, and actinolite. All of these minerals represent a hazard to workers, and the revised standard continues to regulate all of them. However, some forms of these minerals are no longer included in the definition of the word "asbestos". The regulatory text clearly specifies that the standards apply to occupational exposure to asbestos, tremolite, anthophyllite, and actinolite. In the preamble, however, where the word "asbestos" is used this should be interpreted as applying to tremolite, anthophyllite, and actinolite as well.