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ASBESTOS

1977 TLV 5 fibers/cc
 > 5 μ in length
 OSHA Standard 2 fibers/cc
 > 5 μ in length

Synonyms: Asbestos is a generic term applied to a number of hydrated mineral silicates, including chrysotile, amosite, crocidolite, tremolite, and anthophyllite

Physical Form: Fibers of various sizes, colors, and textures

Uses: Thermal and electrical insulation; fire smothering blankets and safety garments; filler for plastics; cement

Exposure: Inhalation

Toxicology: Asbestos causes asbestosis, cancer of the lungs and digestive tract, and mesothelioma.

Asbestosis is a lung disorder characterized by a diffuse interstitial fibrosis, at times including pleural changes of fibrosis and calcification.¹ Chest x-rays reveal a granular change, chiefly in the lower lung fields; as the condition progresses, the heart outline becomes shaggy, and irregular patches of mottled shadowing may be seen.² Asbestos bodies may be found in the sputum, and the

patient exhibits restrictive pulmonary function.¹ Accompanying clinical changes may include fine rales, finger clubbing, dyspnea, dry cough, and cyanosis.¹

The onset of asbestosis probably depends upon the asbestos dust concentration, the fiber morphology, and the length of exposure.³ Asbestosis is a progressive disease which may develop fully in seven to nine years and may cause death as early as 13 years after the first exposure.³ Usually, the pneumoconiosis becomes evident 20 to 40 years after the first exposure to asbestos.³ Once established, the asbestosis progresses even after the exposures have ceased.³ In its severe forms, death results from the inability of the body to obtain requisite oxygen or from the failure of the heart to pump blood through the scarred lungs.¹

Bronchogenic carcinoma and mesothelioma of the pleura and peritoneum are causally associated with asbestos exposures; excesses of cancer of the stomach, colon, and rectum have also been observed.² Among 632 asbestos workers observed from 1943 to 1967, there were 99 excess deaths (above that expected on the basis of the U.S. white male population) for three types of malignancies—bronchogenic (63), gastrointestinal (26), and all other sites combined (10).⁴ Concerning mesothelioma, 80 per cent of the cases studied in South Africa and the United Kingdom were shown to have had an occupational or paraoccupational association with asbestos fibers.⁴ In the U.S., 14 deaths were reported among 532 asbestos insulation workers studied from 1943 to 1968, compared with no deaths, expected in the same number of similar individuals in the general population.⁴

Neoplasm, such as mesothelioma, may occur without radiologic evidence of asbestosis at exposure levels lower than those required for prevention of radiologically evident asbestosis.⁴ Mesothelioma can occur after a short intensive exposure; cases of mesothelioma in children under 19 years of age indicate the latent time period for development of mesothelioma may be shorter than first estimated.⁴ Mesothelioma tumors have yet to be successfully cured by any types of treatment, including chemotherapy, radiation, or surgery; death usually results within a year of diagnosis.¹ Information is in-