cient medical justification; and the right of the media to complete information for an objective as possible coverage of a complex problem.

No single substitute possible

Discontinued use of asbestos for a particular purpose because of health hazards necessarily entails consideration of replacement materials which will provide the benefits. Discussing the potential for substitution of asbestos in industrial applications, Andrew Pye, deputy editor of the U.K. publication *Design Engineering*, emphasized that no single product can be expected to replace asbestos in applications such as industrial textiles, millboard, high-temperature insulation, jointings and seals (including gaskets), friction materials, bearings, electrical insulation and fiber-reinforced composites. Rather, he said, each application must be considered individually.

In many cases, substitutes are not readily available or, if they are, user industries must pay more for them. And in some instances, Pye noted, user industries must bear the costs of research and development of new materials and of acquiring new or modified processing equipment. However, the cost of asbestos has escalated considerably in recent years, he pointed out, while the cost of some substitute materials has been reduced as they have become more widely specified.

Pye added a note of caution, observing that many substitute materials such as mineral wools, ceramic fibers and other fibrillated or pulped materials contain a proportion of fibers classifiable as respirable. Until such materials receive a clean bill of health, he said, their use should be treated with the same degree of caution afforded to asbestos-based products.

Focusing on the health hazards of asbestos substitutes, Dr John Wagner of the Pneumoconiosis Unit at Llandough Hospital in South Glamorgan, Wales, reported on studies of various materials considered as possible replacement substances. These included samples, taken from various regions in the world, of man-made mineral (vitreous) fibers, non-commercial forms of asbestos (particularly tremolite), fibrous zeolites (erionites), and fibrous clays (palygorskite, sepiolite, and attapulgite).

He said that in certain fiber forms of a specific diameter-to-length ratio, both tremolite and erionite were found to be potentially hazardous. Results did not indicate any hazard arising from the man-made mineral fibers, which, he noted, can be controlled as to fiber size, an advantage not available with natural fibers. Nor was any hazard associated with sepiolites in the size ranges contained in samples collected in Spain, Dr Wagner added.

Comment on the rationale for development of legislation and regulations pertaining to asbestos was offered by William Simpson, chairman of the Health and Safety Commission, the agency responsible for developing ob&s policy in Great Britain. He maintained that the setting of control limits for asbestos follows directly from three crucial pieces of information about the substance: the size of the problem, the dose-response relationship, and the different effects of different fibers. Increasing knowledge about the dangerous effects of asbestos has been paralleled by continually improving standards and work practices. Legislators have a great responsibility to support both of these trends, he stated, because sensible legislation depends to a large extent on the development of knowledge not only about what needs to be done, but also about what can be done. As knowledge continues to increase and working conditions and practices to improve, so will legislative controls on asbestos continue to develop, said Simpson.

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