

developed exposure estimates for each product using a weighting scheme based on the relative production volumes of each of the friction products which are the sources of the exposure. Similarly, it is common for many of the asbestos construction products to be used at one building site, making it difficult to attribute fiber release to one particular product. The estimation of ambient exposures due to releases from individual construction products, such as the various flooring products, was difficult since monitoring data were gathered in buildings where more than one type of asbestos flooring product was in place.

For these reasons, EPA believes that it may be appropriate to consider a categorical approach to analyze the risk presented by asbestos products and to control that risk. Table IV lists the products that are included in the construction products and friction products categories.

TABLE IV—EXAMPLES OF ASBESTOS PRODUCT CATEGORIES

Asbestos product category	Asbestos product
Construction product category	Unasphalted roofing felt, Shetland roofing felt, Flooring felt, Vinyl asbestos floor tiles, Fast-backed vinyl flooring, A/C pipe, Corrugated A/C sheet, Flat A/C sheet, A/C sheet shingle.
Friction products category	Unasphalted roofing felt, Shetland roofing felt, Vinyl asbestos floor tiles, Fast-backed vinyl flooring, A/C pipe, Corrugated A/C sheet, Flat A/C sheet, A/C sheet shingle, Unasphalted roofing felt, Shetland roofing felt, Vinyl asbestos floor tiles, Fast-backed vinyl flooring, A/C pipe, Corrugated A/C sheet, Flat A/C sheet, A/C sheet shingle.

ii. Quantitative cancer risk estimates. As discussed above, there exist many asbestos exposure-producing activities to which many kinds of populations are exposed. Applying the cancer models described above to the available data on exposure and populations, EPA has estimated the number of cancers that may be avoided by implementing the EPA's proposed regulatory program. (A full discussion of the risk estimates is contained in the "Regulatory Impact Analysis of Controls on Asbestos and Asbestos Products (Ref. 3)".) Using available data and assuming current exposure levels, EPA calculates that about 2,660 lung cancers and mesotheliomas in the United States would result from production of asbestos products over 15 years without EPA action under TSCA. EPA calculates that this rule would avoid about 1,100 of those potential cancers. Assuming that OSHA achieves strict compliance with a PEL of 0.2 f/cc, EPA calculates that about 1,325 lung cancers and mesotheliomas would result unless EPA takes action under TSCA. EPA

calculates that this rule would avoid about 1,000 of those potential cancers.

EPA also calculated the number of potential cancers avoided by the regulatory alternatives discussed later. Assuming current exposure levels, alternative 1, which would ban the asbestos construction products category and asbestos clothing soon after promulgation of the rule and ban the asbestos friction products category about 5 years later, would avoid about 2,100 cancers; alternative 2, which would ban the asbestos construction products category and asbestos clothing soon after promulgation of the rule, ban the asbestos friction products category about 5 years later, and ban the remaining asbestos products about 10 years later, would avoid about 2,120 cancers; and alternative 3, which would ban the asbestos construction products category and asbestos clothing soon after promulgation of the rule and cover all other asbestos products under the phase-down, would avoid about 2,020 cancers.

EPA believes these estimates of potential number of cancers, and therefore the potential number of cancers avoided, may be low for the following reasons:

a. The estimate is based only on exposures resulting from manufacture of asbestos products through the year 2000. Without regulatory action, manufacture of asbestos products may continue beyond that date.

b. The risk estimates often do not include cancers from consumer and other nonoccupational exposures to asbestos since data are either unavailable or uncertain. However, EPA believes that many people in these categories are at risk. An estimated lifetime risk of cancer of about 1 in 100,000 to about 7 in 100,000 exists for anyone who merely resides in a major city from exposure to asbestos in the ambient air both indoors and outside of buildings. (Ref. 6). Any additional exposure from asbestos products, such as consumer renovation of a house containing asbestos products, residing or working near plants that manufacture asbestos products, or residing or working in the vicinity of a construction project where asbestos-containing products are being installed or removed, will add to the risk of cancer. This additional exposure could increase the lifetime risk of cancer by more than an order of magnitude.

c. The risk estimates did not include all workers whose occupation causes them to come in contact with asbestos products. For example, the estimates do not include occupational exposure

during repair, removal, and disposal of asbestos products other than friction products and cloth.

d. EPA did not make a worst case estimate of asbestos risk. Rather, the risk estimates were based on a relatively conservative interpretation of the dose-response relationship for mesothelioma and lung cancer. Risk estimates more than four times as high could be justified (Ref. 9).

e. EPA did not attempt to quantify reductions of cases of asbestosis and cancers other than mesothelioma and lung cancer. These diseases may add 10 to 20 percent more deaths to the total. OSHA estimates that at an exposure of 0.5 f/cc over a working career, 12 workers per 1,000 will develop asbestosis (Ref. 12). Thus, incidence of asbestosis could be significant among worker populations and possibly among other populations as well. In addition, in a major study of insulation workers exposed to asbestos, about 10 percent of all excess deaths were attributed to cancers other than lung cancer and mesothelioma (Ref. 11).

B. Environmental Effects

Section 0(c) of TSCA requires that EPA state the relevant environmental factors and key considerations which form the basis for regulatory action under section 0(a). The unreasonable risk finding of this proposal is based solely on risks to human health since these risks are by far the most serious consequence of commercial use of asbestos and are sufficient to support this proposed action.

C. Benefits of Asbestos Products and Availability of Substitutes

The benefits of the asbestos-containing products affected by the proposed rule are discussed below. Overall, EPA finds that the benefits to society of these asbestos-containing products are small since suitable substitutes are now available for most uses and applications of asbestos, and products are being developed that will replace almost all uses and applications of asbestos during the phase-down period of this proposal.

1. *Substitutes.* The detailed results of EPA's analysis of the availability of suitable substitutes for asbestos-containing products are reported in Appendix H, "Asbestos Products and Their Substitutes," of the RIA (Ref. 3) and are summarized in Table V.