FILE NAME: DuPont Remington (DRM)

DATE: 1978 Aug

DOC#: DRM015

DOCUMENT DESCRIPTION: EPA Report - Chemical Market Input-Output Analysis of Selected Chemical Substances to Assess Sources of Environmental Contamination - Task III - Asbestos

United States
Environmental Protection
Agency

Office of
Toxic Substances
Washington DC 20460

EPA 560/6-78-005
August 1978

Toxic Substances

EPA

Chemical Market Input/Output Analysis of Selected Chemical Substances to Assess Sources of Environmental Contamination

Task III Asbestos

EPA 560/6-78-005

TR 77-515

CHEMICAL MARKET INPUT/OUTPUT ANALYSIS OF SELECTED CHEMICAL SUBSTANCES TO ASSESS SOURCES OF ENVIRONMENTAL CONTAMINATION: TASK III. ASBESTOS

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Contract No. 68-01-3224 - Task III
SRC No. L1273-08

August 1978

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Washington, D.C. 20460

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the mixture enough to offset environmental considerations (Koliber, 1978). Also, certain polyester fibers produced by DuPont can be substituted for asbestos in this use and still make a useable and economically viable product (Koliber, 1978).

17.3.1 Manufacturing and Emissions

In the manufacturing process, asbestos is mixed with dried aggregate. After a short dry mixing time, hot liquid asphalt is added to the asbestos-containing aggregate and thoroughly mixed (EPA, 1974). As is the case for other asphalt, mastic, and bitumastic processes using asbestos, the only source of environmental release of free-fibers from manufacturing occurs from bag openings and disposals and dry mixing. Considering the current asbestos consumption is less than 100 tons per year, emissions from baghouses or other collection devices are probably very small. In any product scraps which may be disposed, fibers are encapsulated by the asphalt mixture and cannot become airborne.

17.3.2 Emissions from Product Use

Asbestos-asphalt concrete toppings have been applied to bridge decks, airport roadways, and street curbings. It is possible that normal automobile or airplane traffic using these surfaces may enable asbestos fibers to become airborne from surface wear. An exact estimate of the quantity or mileage of asbestos-asphalt concrete surfaces in current use is not available.

17.4 Shotgun Shell Base Wads

Only one shotgun shell manufacturing plant in the United States is known to use commercial asbestos; that plant is located in Bridgeport, Conn., and is operated by Remington Arms Company (EPA, 1974). Personal contacts with

Remington Arms' representatives indicate that asbestos is currently being used; however, the exact annual use quantity was not available. In 1974, approximately 500 tons of asbestos were consumed for shotgun shell production (EPA, 1974). Current use is judged to be approximately the same.

"Asbestos is used to manufacture base wads for shotgun shells. The asbestos is mixed with wood flour and wax, and then pressed into base wads. The weight composition of the final mixture is about 54 percent wood flour, 36 percent asbestos, and 10 percent wax. Asbestos emissions can occur during asbestos addition to the mixture, during mixing operations, and at the wad presses. The emission points are vented to the outside air through particulate collection devices" (EPA, 1974).

17.4.1 Manufacturing Emissions

Process water is not used during manufacturing; therefore, the only asbestos which could be released in waste waters would result from cleaning operations. Such releases are judged to be minor. Product scrap wastes are also judged to be minor.

The major source of emissions occurs from baghouse operations and exhausts. During the course of a year using 500 tons of asbestos in production, roughly one ton of asbestos fibers will be collected in the baghouses by assuming 0.2% of production in air vented to the collectors as was assumed in Section 9.3.4 for a similar manufacturing operation. Baghouse collections are recyclable. Emission quantities to the atmosphere from baghouse exhausts are very small when the Siebert et al. (1976) baghouse efficiency of 99.99% is applied.

17.4.2 Use Emissions

When a shot gun shell is fired from a gun, the base wad is normally expelled from the cartridge and is commonly fragmented into many separate pieces. Monitoring data for asbestos fiber release is not available; however, it may be possible that free fibers are released when a shotgun is discharged with an asbestos-containing base wad.

17.4.3 Alternatives

Other shotgun shell manufacturers apparently do not use asbestos in making base wads, so alternatives to asbestos for this application are commercially available. The exact need for asbestos in some base wads is not clear.

17.5 Artificial Fireplace Ashes

In addition to asbestos joint cements, the Consumer Products Safety Commission has banned the consumer sales of artificial fireplace ashes containing asbestos (Anon., 1977c). In mid-1977, manufacturers stopped producing asbestos fireplace ash in anticipation of a consumer ban (Ray, 1977). This should effectively eliminate this application of asbestos in the future.

Artificial fireplace ashes or emberizing materials are decorative, simulated ashes and embers which are used in some gas-burning fireplace systems to give the appearance of burning embers. They serve strictly a decorative purpose. Artificial emberizing material is sprinkled on or glued to gas logs, or sprinkled on fireplace floors (Ray, 1977).

Between 1971 and 1976, over 100,000 gas logs were reported sold which were frosted or treated by consumers with asbestos-containing materials (Ray, 1977). During 1976, this would indicate that roughly 20,000 gas logs were