THE TRAVELERS ENGINEERING DIVISION

CHEMICAL REACTIONS

Vol. V May 1976 No. 3

Rec'd Please see me

ASBESTOS USES AND CONTROLS

Asbestos is a silicate mineral, a fibrous, naturally occurring material of varying chemical composition. The most common types of asbestos are chrysotile (magnesium silicate), crocidolite (sodium iron silicate) and amosite (iron magnesium silicate).

Asbestos is used in well over three thousand products including building goods and consumer products. Some of these products include asbestos cement blocks, asbestos asphalt tile, gaskets, fireproof clothing, brake lining, furnace and boiler insulation, building fireproofing compounds, and electrical insulation.

Severe lung diseases can be caused by asbestos, such as asbestosis and/or cancer, through the inhalation of excessive quantities of the fiber. It takes approximately 15 to 20 years of exposure to airborne asbestos to develop diseases of the lung or of the gastrointestinal tract. Exposure to asbestos can cause three diseases about which we are concerned: Asbestosis, a fibrotic lung disease; bronchiogenic cancer, a cancer of the lung; and mesothelioma, a cancer of the chest lining or abdominal walls.

The current allowable level of asbestos in the air is five fibers per cc greater than five microns in length for an eight-hour time-weighted average, and no greater than ten fibers per cc at any time during the day (greater than five microns in length). As of July 1, 1976, the eight-hour time-weighted average shall not exceed two fibers per cc greater than five microns in length, and no exposure at any time shall exceed ten fibers per cc greater than five microns in length.

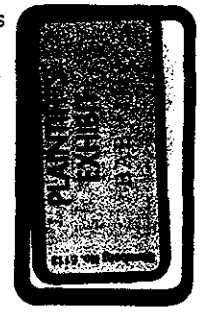
Airborne concentrations of asbestos fibers are determined by collection of the fiber on an 0.8 pore size micron filter of a cellulose acetate type. A sampling pump is placed on the worker and the filter is placed in the worker's breathing zone. The pump draws air through the filter and the fibers are collected on the cellulose acetate filter. The filter is then analyzed by phase contrast microscopy at 450 magnification to determine the fiber concentration in air.

Workers who may be exposed or are at risk to airborne concentrations of asbestos include asbestos miners, insulation workers, demolition crews, brake reliners, shipbuilders and repairers, and construction workers.

Control of the exposure to asbestos can take several routes: Substitute another product that will do the same job; use personal protective equipment, such as NIOSH-MESA approved respirators; use adequate ventilation equipment before the fibers reach the breathing zone of the worker; practice good housekeeping by removing accumulated and settled dust by industrial vacuum cleaning; and wet the product to prevent expulsion of the dust into the air that the worker breathes.

To prevent contamination away from the work place, clothes the workers wear sh not be laundered at home. The clothing should be handled at the work place wh workers are required to change to street clothing, and shower facilities are able.

PRINTED IN U.S.A.



All loose accumulated asbestos should be collected in bags for burial to prevent reentrance into the atmosphere. The workers exposed to airborne concentrations of asbestos should receive medical examinations on a preemployment and periodic basis.

These examinations should cover lung function, chest X-rays, and work history.

The employee in a specific operation that could expose him to asbestos fibers should also be trained relative to protective measures, such as engineering controls and work practices, the use and limitations of proper respiratory equipment, and the purpose of the medical surveillance program.