FYI No. 8

ASBESTOS

Updated January 1993

Asbestos, a resilient, fire-resistant, and non-conductive material, was used in many applications in the early and middle twentieth century as insulation, roofing, and siding. Asbestos products have been linked with serious diseases since the early 1900s.

Asbestos in non-friable form, such as asbestos-cement shingles, roofing, and board, is generally considered safe. If non-friable asbestos products are left in place, there is no known threat. It should always be recognized, though, that water damage, humidity damage, vibrations, or other disturbances can contribute to the deterioration of non-friable asbestos, and thereby render it dangerous. If work is proposed that might affect such materials, or if these materials are to be removed or otherwise handled, great care should be taken not to shatter or pulverize them. If the materials appear to be at all porous, they should be saturated with a fine spray or mist of water before handling.

When asbestos products are "friable" — easily crumbled or crushed into powder — hazardous asbestos fibers are likely to be released and sent airborne. Airborne asbestos fibers, essentially no larger than particles of cigarette smoke and light enough to float long in the air, can easily become lodged in the lungs. Excessive exposure to airborne asbestos fibers can lead to **asbestosis**, a chronic and debilitating disease that will normally strike some twenty years after asbestos exposure has taken place. It is not certain whether low-level exposure to asbestos fibers is dangerous. Studies by the United States Environmental Protection Agency suggest that there is **no** safe level of airborne asbestos fibers.

Asbestos has also been closely linked to a rare cancer, **mesothelioma**, which attacks the linings of the lungs and abdomen. This invariably fatal disease may take as long as fifteen to forty years to become symptomatic. Case histories exist in which children have been exposed to asbestos fibers, contracted mesothelioma, and died within three years. Unlike other asbestos-related diseases, mesothelioma can be contracted from limited exposure at lower dose levels.

Asbestos used as insulation around pipes and boilers is the most common source of these

fibers. Asbestos pipe insulation was commonly used in the period 1920-1975. Products wrapped around pipes that appear to be paper are often found to be impregnated with asbestos to improve their heat resistance characteristics. These particular products are highly dangerous in that the asbestos routinely has deteriorated to a powder form and can be disturbed very easily by vibrations or contact with the surface of the covering.

Friable asbestos can also be encountered in vinyl asbestos floor tiles, various types of sheet vinyls, and some forms of linoleum; in pre-1978 sheetrock spackling compounds; in the linings of heating ducts; in wall or ceiling insulation installed between 1930 and 1950; and in sprayed ceiling finishes from the period 1945-1978. Asbestos is not often found in original plasterwork, but it may be found in plaster repairs, and in acoustical plasters dating from the period 1950-1970.

The EPA can provide further information on asbestos identification and treatment through their EPA Region 4 office, located at 345 Cortland Street, Atlanta, Georgia 30365; (404) 881-3864. Labs qualified to test and analyze asbestos samples can be found through the EPA, (202) 554-1404.

Detecting Asbestos

The presence of asbestos cannot be determined by sight. Asbestos fibers are too small to be normally visible to the human eye. Contractors, plumbers, heating contractors, or building inspectors who have worked with asbestos can often make a reasonable judgement about whether or not a material contains asbestos based on a visual inspection. In some cases, a product manufacturer can determine, based on model number and age of a product, whether the product contains asbestos. An asbestos chemical assay test is available from Mateson Chemical Corporation, (215) 423-3200. This product allows a lay person to make up to 55 separate screening tests for asbestos.

Labs qualified to test material samples and determine the presence of asbestos can be found through the Environmental Protection Agency, (202) 554-1404; or through:

Charles W. Callan, State Asbestos Coordinator
Department of General Services
Division of Engineering and Buildings
805 East Broad Street, Room 101
Richmond, Virginia 23219
804) 786-3263.

The Virginia Department of Housing and Community Development, Division of Building Regulation, publishes the *Virginia Asbestos Survey Standards for Buildings to be Renovated or Demolished* (VR 394-01-7, effective 1 March 1990.)

Asbestos Abatement

Where asbestos, friable or stable, is encountered, it can be treated either by encapsulation or by removal. Non-friable asbestos materials can be left in place without treatment, though there is the potential that future repairs or alterations can affect these materials.

It is recommended that all asbestos encapsulation or removal procedures be contracted to experienced professional firms. Asbestos abatement courses are offered periodically by the Medical College of Virginia and Virginia Commonwealth University (804 786-0494) and by the Industrial Training Company (804 648-7836) in Richmond.

The National Institute of Building Sciences (1015 Fifteenth Street, N.W., Washington, D.C. 20005) publishes the *Model Guide Specifications for Asbestos Abatement in Buildings* (300 pp., $75.)

Encapsulation

Efforts to remove stabilized asbestos materials from a building, especially if carried out by unskilled persons, has the potential to trigger the dangerous release of more asbestos fibers than would be expected if the material were left in place. Most experts agree that any asbestos that is stable enough to be left in place should still be encapsulated to reduce its propensity to leak fibers into the air. Encapsulating asbestos means containing it — sealing it off from occupied areas — in an airtight matrix, resistant to accidental disturbance. Encapsulants are physical barriers, whether of sheetrock, plywood, plastic or polyethylene sheeting, regular paint or plaster, or special "penetrating" or "bridging" asbestos encapsulants.

Encapsulation is not appropriate for all asbestos-containing materials. Where asbestos is accessible to the users of a building, where it has poor cohesive strength, where it is water-damaged, or where it is more than one inch thick, the EPA does not recommend encapsulation.

Asbestos-containing ceiling tiles can be encapsulated by constructing a well-sealed dropped ceiling of sheetrock or plywood below them (and above, if necessary.) Asbestos insulation around piping can be safely isolated by wrapping plastic sheeting around it and sealing it airtight with duct tape. Asbestos-containing floor tiles, often laid over asbestos sheeting, release veritable clouds of fibers when disturbed; these fibers should be contained by laying new flooring over the old.

Encapsulation may be appropriate for asbestos insulation around water and steam pipes. Years of oxidation and deterioration have probably loosened the hold of the binders in the asbestos fibers inside the insulation wrapping. A water-based foaming agent that penetrates and wets these fibers should be applied. (Plain water will leach out the binders when it dries and leave the fibers free to dust.) Two types of water-based encapsulants are generally available.

Penetrating encapsulants are adhesives that penetrate deep into fibrous substrates and air-dry in a few hours, leaving a tacky film on the surface and re-gluing loose asbestos fibers inside the mass. Bridging encapsulants, applied following the wetter and penetrant, dry hard on the surface of the mass to form an airtight, waterproof seal.

Encapsulated asbestos materials are always subject to damage if disturbed, and they must eventually be removed if a building is to be demolished. Wherever encapsulation is carried out, appropriate measures should be taken to identify the materials for future reference, so that later alterations that may disturb the asbestos materials can be avoided.

Asbestos Removal

Removal of asbestos materials is the only long-term solution. All other procedures are temporary methods of delaying removal. Removal of asbestos materials should be undertaken only by experienced professionals. Any efforts to manipulate asbestos poses serious dangers to the workers involved, and attempts by unskilled persons to remove asbestos may result in dangerous contamination of the area.

There are some 3000 asbestos abatement contractors in the United States. Adherence to asbestos treatment standards prepared by the Environmental Protection Agency and by the Occupational Safety and Health Administration is necessary.

If you have further questions regarding asbestos, please contact the Environmental Protection Agency, (202) 554-1404; the Virginia Department of Housing and Community Development, Division of Building Regulatory Services, (804) 786-5405; or the Department of Historic Resources at (804) 367-2323.