

ASBESTOS HAZARD AND ENERGY RETROFIT

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WHAT IS ASBESTOS?

Asbestos is a term referring to a group of naturally-occurring mineral fibers. There are numerous names for the various asbestos types, with "Chrysotile" asbestos accounting for more than 90% of the asbestos encountered in this country. The word asbestos is commonly used to describe what is more correctly identified as an "asbestos containing material" (ACM). Any material that contains more than 1% asbestos fibers is an ACM and must be handled in accordance with OSHA and EPA guidelines for asbestos.

The condition of an ACM is quite important. An ACM that, using hand pressure, can be easily crumbled to produce dust is said to be "friable". An ACM that cannot be readily crumbled is called "non-friable". Most of the concern with ACM is directed at friable materials.

HEALTH HAZARDS

Breathing airborne asbestos fibers has been implicated in causing lung cancer, mesothelioma (fatal cancer of the pleural cavity), asbestosis, and various cancers of the digestive tract. The relationship of fiber counts and fiber types to health hazard is a subject of ongoing debate among health professionals, however, one point is clear:

- Breathing Asbestos fibers can be a serious health hazard.

OSHA, the EPA, and many state and local governments regulate the handling and disposal of ACM.

APPLICATIONS OF ASBESTOS

Asbestos has been a ubiquitous material in the building industry for many years. Date of insulation is NOT a primary criteria by which to judge the asbestos content of a material. Friable asbestos products have been advertised in the trade press at least as recently late 1984, and building panel and floor tile containing asbestos is still legally (but often improperly) installed every day.

Energy retrofitters encounter friable asbestos in three primary areas:

- Duct insulation and tape
- Piping/boiler insulation
- Attic insulation

Virtually any material associated with residential duct systems that looks like paper, paper tape, cardboard, or foil-coated cardboard may be assumed to be ACM, often quite friable. Lab testing of these materials is redundant. The same applies to paper or cardboard piping and to boiler insulation materials.

Friable ACM in the air stream is of highest concern. Asbestos paper tape, typically painted black, is often found in older supply air registers. When a ceiling consisted of sprayed acoustic containing asbestos, the acoustic was sometimes sprayed inside ceiling registers.

Older pipe/boiler insulation other than paper almost always contains asbestos, but newer materials may be asbestos-free, and lab testing is required. Attic insulation often does not contain asbestos, so lab testing is required with products of unknown composition. The lab test used is "Polarized Light Microscopy (PLM) bulk test for asbestos", and costs about \$50 per sample.

Most mechanical systems or structures insulated with ACM are not well insulated by today's standards (with sound pipe insulation being an occasional exception), and are a prime candidate for energy retrofit. Duct systems are the worst culprits, moving conditioned air through unconditioned spaces with virtually no insulation and 15 to 25% leakage rates or more! Attics may require added insulation, and pipe/boiler lagging may require repair or replacement. In all instances, asbestos hazard must be managed prior to, or in conjunction with, energy retrofit.

MANAGING THE ASBESTOS HAZARD

Asbestos hazard is managed in a step-by-step fashion:

- Building inspection and initiation of records
- Abatement of any immediate hazard
- Sampling and analysis of suspect materials
- Assessment of the need for abatement
- Discussion of abatement alternatives with owner
- Initiation of hazard abatement
- Installation of an operations and maintenance (O&M) program
- Maintenance of asbestos records

ABATEMENT METHODOLOGIES

Four means of asbestos hazard abatement are used, normally in combination:

- Monitoring
- Encapsulation (penetrating or bridging)
- Enclosure
- Removal

No one method is necessarily superior to any other. Each method is appropriate in some applications and inappropriate in others. In energy retrofit, for instance, removal is often NOT the best choice from either a cost or a fiber hazard viewpoint. The choice of abatement method is based on :

- Type/thickness/ absorptivity of ACM
- Quantity, condition, and location of ACM
- Use of the space
- Population exposed
- Quality of maintenance
- Life cycle cost analysis

AIR MONITORING & CONTRACTOR QUALIFICATIONS

Air monitoring is normally done by asbestos contractors to validate that their work practices are not creating elevated fiber counts. OSHA specifies a maximum personal exposure level (PEL) for workers, with serious fines for non-compliance. In all states any contractor removing asbestos is required, as a minimum, to have an EPA Hazardous Waste Generator Number and an OSHA Asbestos Identification Number. In addition, some states have special qualifications. California, for instance, requires that contractors be specifically tested and licensed to handle asbestos, with substantial penalties (against owners as well as contractors) for violations after 1/1/87.

Currently there is no standard for non-workplace exposure.