



Loss Control TIPS

Technical Information Paper Series

Innovative Safety and Health SolutionsSM

Asbestos-Containing Material (ACM) In Buildings

The presence of asbestos in buildings, particularly those with sprayed-on asbestos fireproofing, sprayed or trowelled-on asbestos surfacing materials on walls or ceilings, or asbestos thermal insulation (e.g. pipe lagging or cloth wrapping), is a potential concern. As discussed later, you will need to implement and assess the presence and effectiveness of a formal *Management Plan* or *Operations and Maintenance Program* to manage this risk. This Plan and/or Program must respond appropriately to asbestos-containing materials in buildings.

(Note: All *italicized* words are defined in the Appendix of this paper.)

Background on Asbestos and Regulations

In 1973, EPA banned sprayed asbestos-containing materials (ACM); in 1978, the agency prohibited the use of trowelled-on or wet-applied asbestos-containing insulation products. Asbestos is still used in many products, such as vehicle and elevator brakes; roofing shingles, felt, and coatings; building panels; electrical insulation materials; specialized thermal insulation; and water pipes.

In 1991, EPA banned asbestos in other infrequently or rarely encountered products, including corrugated paper, roll board, commercial and specialty papers, flooring felt, and any new uses. They also have labeling requirements for any asbestos-containing product. Some products can still be made with asbestos, including asbestos cement products like pipe or sheeting (transite), vinyl tile, fireproof clothing, and gaskets.

ACMs of most concern are surfacing materials sprayed or trowelled on ceilings and walls; thermal insulation on pipes, boilers, and tanks; and sprayed-on structural fireproofing. Sprayed-on fireproofing may contain fibrous material that is not asbestos. It is extremely difficult to identify asbestos without special training; even "trained" *inspectors* require laboratory analysis to confirm the presence of asbestos. If the material is fibrous, suspect asbestos unless you can be shown conclusively that the material is not asbestos (e.g., via a formal laboratory report).

Asbestos is generally white or gray; rarer brownish or bluish forms are not prevalent in the United States. Once ACM is identified, its condition must be assessed. For the time being, the only accepted assessment criteria are those established by EPA in the Asbestos Hazard and Emergency Response Act (*AHERA*).

Some asbestos-containing surfacing materials and fire-proofing products are considered *friable*. *Friable* is defined as the ability to be crumbled, pulverized, or reduced to powder by hand pressure.



Asbestos in vinyl floor tiles, transite (asbestos cement), roof shingles, and asbestos wall siding (shingles), is not normally considered *friable*. These ACMs do not represent a significant hazard, as long as the material is in good repair and not subject to abuse.

Vinyl asbestos floor tile or linoleum can become *friable* through misuse. Asbestos fibers can become airborne through sanding or even through prolonged dry buffing. Normal polishing, cleaning, or buffing may release minor amounts of asbestos, but not in quantities significant enough to pose a health threat.

About 20% of buildings in the U.S. (733,000) have some type of *friable* ACM. About 5% of U.S. buildings have sprayed-on or trowelled-on *friable* ACM, and about 16% have *friable* ACM in pipe and boiler insulation. Buildings built in the 1960s are more likely to contain sprayed-on or trowelled-on asbestos surfacing materials, although buildings from the early 1970s also have extensive ACM.

Buildings constructed in the 1950s, 1960s, and 1970s are more likely than newer ones to have ACM in boiler and pipe insulation. No significant differences in percent of asbestos content are found in buildings of different size or construction type (masonry, frame, steel beam).

Responding to Asbestos-Containing Materials (ACMs) in Buildings

Asbestos-containing materials in school buildings are regulated by the Environmental Protection Agency under the Asbestos Hazard Emergency Response Act (*AHERA*). Inspections are mandated to determine the presence and condition of asbestos-containing materials; if asbestos is found, a formal *management plan* must be put in place. (A summary of *AHERA* appears in an Appendix to this paper.) Owners of buildings with ACMs should be familiar with the information in this release since it will be used as a guide to determine appropriate handling of asbestos.

Since *AHERA* does not apply to commercial buildings, it is not necessary to achieve absolute compliance. In 1990 the *Asbestos School Hazard Abatement Reauthorization Act (ASHARA)* amended *AHERA* to extend some training and accreditation requirements to persons performing certain types of asbestos-related work in public and commercial buildings. Also in 1990, the Environmental Protection Agency issued a booklet entitled *Managing Asbestos in Place: A Building Owner's Guide to Operations and Maintenance Programs for Asbestos-Containing Materials* (Green Book). EPA recommends applying the guidance in this document to ACM in all public and commercial buildings.

Currently, only the ASHARA federal regulations apply to asbestos in non-school buildings, but the *AHERA* requirements are rapidly becoming the model for addressing ACM in non-school buildings. Some state and local governments regulate asbestos in commercial buildings. Be certain to check the regulations that apply to buildings in your local territory. In the absence of more specific Federal or local regulations, building owners with ACM should follow the guidelines published by EPA in *Managing Asbestos in Place*, which are based on *AHERA*.

Asbestos may have been removed from buildings; if so, building owners must have records indicating that *clearance air samples* were taken and are "clean" (containing 0.01 fibers/cc or less).

Asbestos *removal* is not the only acceptable abatement method, nor is it a cure-all! The *response action* chosen should be appropriate for the ACM type and condition, and the likelihood of disturbance or damage, as described below. Several studies indicate that unless *removal* is performed extremely carefully, airborne asbestos levels following *removal* may actually be higher than they were before the removal.

Building owners and safety and health consultants must understand that asbestos need not be removed to control the hazard. In fact, *removal* may not be the most desirable control option. Other *response actions* may be preferable, including *repair, encapsulation, enclosure*, or development of an *Operations and Maintenance Program* (see *AHERA Summary* in Appendix and EPA's *Managing Asbestos in Place*). If asbestos remains, the *Management Plan* must periodically assess airborne asbestos levels via the *Operations and Maintenance Program*.

Only specifically trained, *accredited* individuals should offer advice on *inspections, response action* design or abatement (*response action*) alternatives. Prudent risk management will refer these issues to a state or *EPA accredited management planner*.

If ACM is present, and if a formal *management plan* is in effect, then evaluate the effectiveness of this plan by addressing these key items:

- 1) inventory of ACM and classifications (or assumption that suspect materials are asbestos)
- 2) summary of findings and assessments
- 3) appropriate response actions or preventive measures
- 4) schedule for implementing the Plan

Finally, be certain that the Plan is being implemented and that *clearance air samples* are at or below 0.01 fiber/cc. This evaluation is identical to that which would be done to assess any other management plan (such as Hazard Communication) and requires no more knowledge of regulations than appears in the attached summary of *AHERA* (Appendix).

Building owners must also be aware of employee health or safety or Workers' Compensation hazards created when building maintenance staff work with or adjacent to ACM. Workers may encounter intermittent exposures that could exceed the OSHA action limit of 0.1 fiber/cc of air. Confirm implementation of monitoring and all applicable provisions of the OSHA Asbestos Standard (29 CFR 1910.1001). (NOTE: The OSHA permissible level of airborne asbestos is significantly higher for employees/workers than for the general public under AHERA. Nonetheless, it is still relatively easy for workers who handle ACM to receive exposures at or above the OSHA action limit.)

For more information, contact your local Hartford agent or your Hartford Loss Control Consultant. Visit The Hartford's Loss Control web site at <http://www.thehartford.com/corporate/losscontrol/>

This document is provided for information purposes only. It is not intended to be a substitute for individual legal counsel or advice on issues discussed within. Readers seeking resolution of specific legal issues or business concerns related to the captioned topic should consult their attorneys and/or insurance representatives.

References and Other Resources

1. United States Department of Labor, Occupational Safety and Health Administration. *Respiratory Protection Standard* (29 CFR 1910.134).
2. United States Department of Labor, Occupational Safety and Health Administration. *General Industry Standard for Asbestos* (29 CFR 1910.1001).
3. United States Environmental Protection Agency. *Asbestos Hazard Emergency Response Act (AHERA) Regulations* (40 CFR 763 Subpart E).
4. United States Environmental Protection Agency. *Asbestos-Containing Materials in School Buildings: A Guidance Document, Parts 1 and 2*, March 1979 (Orange Books).
5. United States Environmental Protection Agency. *Guidance for Controlling Asbestos-Containing Materials in Buildings*, June 1985 (Purple Book).
6. United States Environmental Protection Agency. *Managing Asbestos in Place: A Building Owner's Guide to Operations and Maintenance Programs for Asbestos-Containing Materials*, July 1990 (Green Book). (This publication is available from the Superintendent of Documents as: USEPA, Pesticides and Toxic Substances (TS-799), 20T-2003, July 1990.)
7. United States Environmental Protection Agency. *National Emission Standards for Hazardous Air Pollutants (NESHAPS) Regulations* (40 CFR 61.140), Subpart M, Asbestos.
8. United States Environmental Protection Agency. *Toxic Substances Control Act, Asbestos (40 CFR 763 Subpart G), Public Employees not Covered Under OSHA or State Programs*.

Appendix:

Summary of the U.S. Environmental Protection Agency's Regulations for Asbestos Hazard Emergency Response Act (AHERA) 1986 and Asbestos School Hazard Abatement Reauthorization Act (ASHARA) 1990

The Asbestos Hazard Emergency Response Act (AHERA) deals only with asbestos-containing materials (ACMs) in schools. The Asbestos School Hazard Abatement Reauthorization Act (ASHARA) amends AHERA to extend some of the training and accreditation requirements to persons performing certain types of asbestos-related work in public and commercial buildings. Only limited definitions and detail are provided here.

Introduction

The suspected presence of asbestos must be confirmed or denied by *accredited* EPA asbestos *inspectors* who have successfully completed an EPA-approved training course. Otherwise all suspect ACM must be assumed to contain asbestos.

This training is required to become *EPA-accredited*:

1. *Inspector*: Three-day training course.
2. *Management Plan Developer*: Inspector course plus two additional days.
3. *Contractor*: Five-day course for supervisors and contractors; four days for workers.
4. *Maintenance Workers*: Awareness training of at least two hours, plus fourteen more hours if they are likely to disturb ACM.

Note that these are not rigorous educational requirements. even though the participant must pass an examination and undertake annual retraining.

If asbestos *is not* found, the results should be documented and kept on file. If asbestos *is* identified or assumed, it must be either removed by an *EPA-accredited contractor* or otherwise managed or controlled through an *Operations and Maintenance Program*.

Asbestos containing materials may remain in occupied buildings for many years, since it is often not technically feasible, cost-effective, or appropriate to *remove* it all immediately. These in-place materials must be managed or controlled effectively to minimize occupant exposure and environmental risk.

General Responsibilities for the Coordinator

The first portion of *AHERA* requires designating a *Coordinator* to ensure that:

- 1) *inspections*, reinspections, periodic surveillance and *response action* activities are carried out in accordance with the final U.S. EPA rule
- 2) custodial and maintenance employees are properly trained
- 3) workers and building occupants are informed annually about *inspections*, *response actions* and post-response action activities, including reinspections and periodic surveillance

- 4) short-term workers who may come in contact with asbestos are given information about locations of asbestos in the facility
- 5) warning labels are posted as required
- 6) *management plans* are available for review (NOTE: At a minimum, good risk management practice requires an *Operations and Maintenance Program* for ACM or assumed ACM that remains, whether or not there is a written *Management Plan*.)

The *Coordinator* must also consider whether any conflicts of interest may arise among accredited personnel. EPA wants to minimize collusion between *management planning* and *contractors*, or *contractors* and abatement laboratories.

Inspections and Reinspections

An *accredited inspector* must visually inspect all areas of each building to identify *friable* and non-friable suspected ACM, must determine friability by touching, and must either sample the suspected ACM or assume that the suspected materials contain asbestos. The *inspector* must then inventory areas where samples are taken or where material is assumed to contain asbestos. Finally, the *inspector* must assess the physical condition of *friable* known or assumed ACM (see Assessment, below).

Friable is defined as the ability to be crumbled, pulverized, or reduced to powder by hand pressure. Essentially this is a subjective judgment of the *inspector*.

An *accredited inspector* must conduct reinspections at least once every three years. The *inspector* must reinspect all known or suspected ACM and must determine by touching whether non-friable material has become friable since the last inspection. The *inspector* may sample any new *friable* material or may continue to assume the material to be ACM. The *inspector* shall record changes in the material's conditions, sample locations, and the inspection date for inclusion in the *management plan* or the *operations and maintenance program* (described below). In addition, the *inspector* must assess newly *friable* known or assumed ACM, reassess the condition of *friable* known or assumed ACM, and include assessment and reassessment information in the *management plan* or *operations and maintenance program*. It should be noted that although an individual must be accredited to perform an inspection in public and commercial buildings, inspections are not required. It is allowable to assume that certain types of materials contain asbestos and manage them accordingly.

Sampling and Analysis

The complex issues of sampling and analysis are explained in great detail in *AHERA* for the benefit of the *Inspector*. It is important for building owners and safety and health consultants to know that *clearance sampling* concentrations cannot exceed 0.01 fibers per cc of air.

Inclusion of detailed requirements for sampling and analysis is inappropriate here since these issues are highly technical. If these items become serious concerns, consult with the *accredited asbestos management planner* for further information.

Assessment

A general assessment procedure must be conducted by an *accredited inspector* during each inspection or reinspection. The *inspector* must classify ACM and suspected ACM in school buildings into broad categories appropriate for *response actions* (described below). In the written assessment, the *inspector* must give reasons to support the classification decisions.

Assessment may include the location and amount of material, its condition, accessibility, potential for disturbance, known or suspected causes of damage, or preventive measures that might eliminate the reasonable likelihood of damage.

The *coordinator* must select an *accredited management plan developer* who, after a review of the results of the inspection and the assessment, shall recommend in writing appropriate *response actions*.

Management Plans

AHERA requires that the *coordinator* develop an *Asbestos Management Plan* for each building under its administrative control or direction. The plan must be developed by an *accredited asbestos management planner*. EPA under *ASHARA* does not require *management plans* or *management planner* accreditation for public and commercial buildings. Major components required in the Plan include:

- a description of inspections and *response actions*
- an assurance that accredited persons were used to conduct inspections, develop *management plans*, and design completion of *response actions*
- a plan for reinspection, periodic surveillance, and *operations and maintenance*

Response Actions

AHERA identifies five major response actions (Abatement Options):

1. *Removal* is often viewed as the only acceptable alternative. Removal procedures are exacting and must be performed only by experienced, trained staff.
2. *Repair* is limited to very minor patching or fixing holes in slightly damaged ACM or insulation. Repair is not removal!
3. *Encapsulation*; that is, sealing the ACM with a binding agent to prevent fiber release and to provide some resistance to damage from impact. The technique is useful only if the ACM is well adhered to the surface.
4. *Enclosure*; that is, erecting an air-tight barricade between the ACM and the surrounding area.
5. *Operations & Maintenance Programs* (described below briefly but in more detail in EPA *Managing Asbestos in Place*) are required to manage any ACM that will remain in the building. The program must be written, detailed enough to respond to any anticipated release, and effective in its implementation.

Repair, *encapsulation*, or *enclosure* are interim solutions until the asbestos is eventually removed through planned abatement or in conjunction with renovations, repairs, or demolition. These methods are a means of control against fiber release episodes while managed under an *Operations and Maintenance Program*. Any of these may be effective for many years.

AHERA identifies the steps that must be taken to properly conduct and complete the *response actions*. The *response action* selected must be sufficient to protect human health and the environment. The *Coordinators* must use *accredited* persons to design or conduct *response actions*.

Definitions of Response Actions

Different *response actions* are required for each of the five major categories of damaged or potentially damaged ACM. The categories are:

1. damaged or significantly damaged thermal system insulation ACM;
2. damaged *friable* surfacing or miscellaneous ACM;
3. significantly damaged *friable* surfacing or miscellaneous ACM;
4. *friable* surface or miscellaneous ACM and thermal system insulation ACM which has potential for significant damage; and
5. *friable* surfacing or miscellaneous ACM; thermal system insulation ACM which has potential for damage.

Procedures for controlling or abating the hazards posed for the ACM are set forth for each of these categories.

Note: Limited information is delineated to address non-friable ACM or materials which are not subject to damage. The definition of friable ACM includes nonfriable ACM when such material becomes damaged to the extent that when dry, it may be crumbled, pulverized, or reduced to powder by hand pressure.

Operations and Maintenance Program

This portion of the Plan is essential for all ACM that will remain in the building or that management assumes to contain asbestos! EPA now feels that ACM management in place through an effective O&M Program is, in most situations, more desirable than abatement. This would depend on the condition of existing ACM (confirmed or assumed) and the potential for damage.

Response actions for ACM with potential for damage and potential for significant damage emphasize *Operations and Maintenance (O & M)* and preventive measures to eliminate the reasonable likelihood that damage will occur. When potential damage is possible, the *coordinator* must at least implement an *O & M Program*. If there is potential for significant damage and preventive measures cannot be effectively implemented, *response actions* other than *O & M* or area isolation may be required.

AHERA requires the *Coordinator* to implement an *Operations and Maintenance Program* for any school building in which *friable* ACM is present or assumed to be present. The *O & M program*, which must be documented in the *Coordinator's Management Plan*, is an independent program consisting of notification, surveillance, controls, work practices, recordkeeping, worker protection, and training. EPA recommends *O&M Programs* (at a minimum) for managing ACM in public and commercial buildings.

The *O & M program* is both a process and a document which is designed to:

- provide a current inventory of all remaining ACM
- record any abatement activities planned or unexpected that involved ACM
- indicate any fiber release episodes
- protect building occupants from exposure to asbestos
- reduce the potential hazard to building occupants from exposure to asbestos
- reduce the potential liability of building owners and managers

The final rule requires that *O & M* activities that disturb asbestos shall be designed and conducted by persons *accredited* to do such work (except for small scale-short duration projects). Finally, procedures are provided for responding to fiber release episodes -uncontrolled or unintentional disturbance of ACM.

Small scale-short duration (SSSD) activities are tasks such as, but not limited to:

- a) removal or repair of small quantities of ACM pipe or beam insulation in conjunction with repairs or other maintenance activity and not intended solely as asbestos abatement
- b) replacement of an asbestos-containing gasket on a valve
- c) installation of electrical conduit through or approximate to asbestos containing materials, or
- d) repairs to a small piece of asbestos wallboard

To help clarify the application and limits of the *SSSD*, EPA defines minor and major fiber release episodes. A minor fiber release episode is any uncontrolled or unintentional disturbance of an ACM resulting in visible emission that involves the disturbance of 3 square or linear feet.

EPA uses *SSSD* and minor fiber release episode to distinguish between activities that can be handled by *trained maintenance workers* (total of 16 hours training required) and those handled by *accredited asbestos workers* (total of 4 days training required) for a major fiber release episode (disturbance of more than 3 square or linear feet).

Training and Periodic Surveillance

The *Coordinator* must ensure that all members of the maintenance and custodial staff receive at least two hours of awareness training. The *coordinator* must also ensure that staff who will conduct any activities that will disturb ACM receive an additional fourteen hours of training. Specific topics to be covered in the two-hour and fourteen-hour courses are described in the Act.

AHERA requires that periodic surveillance be performed at least once every six months. Unaccredited personnel (such as custodians or maintenance workers) may conduct surveillance activities. Periodic surveillance requires checking known or assumed ACM to determine if its physical condition has changed since the last inspection or surveillance. The date of the surveillance, and any changes in the condition of the ACM, must be documented in the *Management Plan*.

Completion of Response Actions

After a thorough visual inspection has been done, air testing is performed to determine if a *response action* has been completed. *Clearance air monitoring* will not be required for small scale, short duration projects.

AHERA requires *clearance air sampling* by transmission electron microscopy (TEM) for most *removal, enclosure, and encapsulation response actions*. Successful completion of a *removal response action* will be determined by a careful visual inspection, followed by a sequential evaluation of five samples taken inside the work site, and five samples taken outside the work site. Both sets of samples must be taken at the same time to insure that atmospheric conditions are the same and that comparisons are valid. These samples are referred to as *clearance air monitoring*.