



Property Risk Consulting Guidelines

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ASBESTOS CONTAINING MATERIALS

INTRODUCTION

Asbestos is the name applied to a naturally occurring group of fibrous minerals which have a common general formula. The minerals have characteristic electric and heat-resistant properties. They are not combustible and do not conduct electricity. Asbestos can be easily processed into many products, such as fabrics, cord, batting, mats and boards. These products were commonly used prior to the 1970s for insulation from the effects of heat and electricity.

The U.S. Environmental Protection Agency (USEPA) has developed standards and guidelines to control the release of Asbestos Containing Materials (ACM). Friable materials, those that are easily crumbled, crushed or pulverized, are especially hazardous. Coated, covered or fabricated materials in deteriorated or damaged condition may also be hazardous. ACM in good condition are in the controlled hazard category but are not regarded by the USEPA as immediately hazardous and do not necessarily require removal. AXA XL Risk Consulting agrees with the USEPA ruling; however, there are serious ramifications when ACM are damaged in fire or explosion.

If fire or explosion damages ACM in a building, salvage and repair or demolition cannot begin until the surrounding area is decontaminated of asbestos. Extensive control measures are required and excessively high costs are being incurred for asbestos abatement following fire or explosion. The process of removing ACM will extend business interruption beyond that which would occur in a normal fire or explosion loss.

This PRC Guideline discusses identification of ACM, abatement practices, fire protection during abatement and a preplanned remediation program.

POSITION

Because of the seriousness of ACM damaged in fire or explosion:

- Survey buildings built or renovated prior to 1978. Identify and record the presence of ACM. The record should list product, form, condition, quantity, location and use. Where identification is uncertain, consider the material as ACM. Take samples of the uncertain material and have them analyzed. Record and retain a report of the survey and all results of analyses. Store duplicate records in a separate protected location. The records may also be required to confirm a non-ACM product in event of a loss. Include a copy of the record with the plant pre-emergency plan documents.
- Provide a plan for post-fire remediation where the in-place quantity of ACM exceeds 160 ft² (14.9 m²) of surface material or 260 linear feet (79.3 linear meters) of pipe insulation.

- When remediation actions are undertaken:
 - Use noncombustible or fire retardant materials for temporary enclosures.
 - Inspect temporary wiring and power equipment.
 - Prohibit smoking for the entire project area.
 - In multistory buildings, do not abate two consecutive floors simultaneously.
 - If an existing fire/smoke detection system or a sprinkler system needs to be taken out of service, impair only those portions in the abatement area. Cap off in the effected sprinkler system area so that the rest of the system remains activated.
 - Provide manual protection equipment, such as hose connections and portable extinguishers in the impaired areas and increased watch service.
 - Provide suitable means of emergency communication.
 - Provide an alarm to sound when the negative-pressure in the abatement area is lost. In an accessible area outside the abatement area, provide an emergency shutdown switch for the fans if the discharge from the fans could reenter the area.
 - Cutting and welding should not be allowed in or around the enclosure.
 - Tag hot pipes and exposed electrical circuits. Prevent foreign materials from becoming in contact with them.
 - Remove rubbish and debris daily.

NFPA 241 provides guidelines for construction, alteration and demolition operations. Overall, the document is considered applicable to asbestos abatement projects. Chapter 7 discusses fire protection and places particular emphasis upon access and security. When protection for special projects is evaluated, however, access and security frequently do not receive sufficient attention.

DISCUSSION

As long as ACM in buildings remains in good condition, release of fibers is unlikely. However, when ACM are disturbed or damaged, fibers are released creating a contaminated environment. In the U.S., a contaminated environment must be reported to the USEPA. The concerns are:

- Improper removal of ACM from a facility can create a dangerous exposure where none previously existed.
- When ACM are disturbed or damaged, fibers are released creating a contaminated environment. Before ACM can be removed, a properly enclosed and controlled environment must be established.
- ACM can be disturbed or damaged if it becomes involved in an unplanned incident such as a fire or explosion. The surrounding atmosphere needs to be cleaned up and all remaining ACM must be successfully removed from the fire scene before salvage and restoration of business can begin.

Identification

Preliminary identification of ACM need not be a difficult task. However, in extreme cases, laboratory analysis may be necessary. Products containing more than 1% of asbestos are regulated. Typical examples of common building materials which may be suspected of ACM are boiler and pipe insulation, fireproofing insulation, HVAC duct insulation, electric wiring insulation and ceiling tiles. (See Table 1 for additional suspect ACM.)

The use of asbestos in the manufacture of many of these products has now been curtailed. [Table 2](#) lists generic names of product types, the years they were used and the percent of asbestos included in the product. The date of building construction or product installation is of initial importance. The first regulations by EPA were issued in 1973. In 1975 and again in 1978 the regulations were revised to be more inclusive. Building “renovation” was included in the ban on insulating ACM. Any building designed and constructed prior to 1973 will probably contain or has contained ACM. Any renovation

project undertaken prior to 1978 may contain ACM. More recent construction and renovation projects are not likely to contain ACM.

TABLE 1
Sample List of Suspect Asbestos-Containing Materials

Cement Pipes	HVAC Duct Insulation
Cement Wallboard	Boiler Insulation
Cement Siding	Breeching Insulation
Asphalt Floor Tile	Ductwork Flexible Fabric Connections
Vinyl Floor Tile	Cooling Towers
Vinyl Sheet Flooring	Pipe Insulation (Corrugated air-cell, block)
Flooring Backing	Heating and Electrical Ducts
Construction Mastics (floor tile, carpet, ceiling tile, etc.)	Electrical Panel Partitions
Acoustical Plaster	Electrical Cloth
Decorative Plaster	Electric Wiring Insulation
Textured Paintings/Coatings	Chalkboards
Ceiling Tiles and Lay-in Panels	Roofing Shingles
Spray-Applied Insulation	Roofing Felt
Blown-in Insulation	Base Flashing
Fireproofing Materials	Thermal Paper Products
Taping Compounds (thermal)	Fire Doors
Packing Materials (for wall/floor penetrations)	Wall & Roof Siding
High Temperature Gaskets	Caulking/Putties
Laboratory Hoods/Table Tops	Adhesives
Laboratory Gloves	Wallboard
Fire Blankets	Joint Compounds
Fire Curtains	Vinyl Wall Coverings
Elevator Equipment Panels	Spackling Compounds
Elevator Brake Shoes	

Referenced from EPA 20T-2003 July 1990, *Managing Asbestos in Place*.

TABLE 2
Asbestos-Containing Materials Found In Buildings

Subdivision	Generic Name	Asbestos (%)	Date Of Use	Binder/Sizing
Surfacing material	Sprayed-or troweled-on	1-95	1935-1970	sodium silicate, portland cement, organic binders
Performed thermal insulating products	batts, blocks and pipe covering 85% magnesia calcium silicate	15 6-8	1926-1949 1949-1971	magnesium carbonate calcium silicate
Textiles	Cloth blankets (fire) felts sheets cord/rope/yarn curtains curtains (theatre, welding)	100 90-95 50-95 80-100 60-65	1910-present 1920-present 1920-present 1920-present 194 5-present	none cotton/wool cotton/wool cotton/wool cotton
Cementitious concrete-like products	extrusion panels corrugated flat laminated roof tiles pipe	8 20-45 40-50 35-50 20-30 20-15	1965-1977 1930-present 1930-present 1930-present 1930-present 1935-present	portland cement portland cement portland cement portland cement portland cement portland cement
Paper products	corrugated: high temperature moderate temp millboard roofing felts shingles	90 35-70 80-85 10-15 1	1935-present 1910-present 1925-present 1910-present 1971-1974	sodium silicate starch starch, lime, clay asphalt asphalt
Asbestos-containing compounds	calking putties adhesive (cold applies) roofing asphalt mastics asphalt tile cement plaster/stucco sealants fire/water cement, insulation cement, finishing	30 5-25 5 5-25 13-25 2-10 50-55 20-100 55	1930-present 1945-present unk-present 1920-present 1959-present unk-present 1935-present 1900-1973 1920-1973	linseed oil asphalt asphalt asphalt asphalt portland cement caster oil or polyisobutylene clay clay
Asbestos epoxy products		50-55	1930-present	portland cement
Flooring tile and Sheet Goods	vinyl/asbestos tile asphalt/asbestos	21 26-33	1950-present 1920-present	poly(vinyl)chloride asphalt

Referenced from EPA 560/5-85-024 June 1985, *Guidance for Controlling Asbestos-Containing Materials in Buildings*.

A survey should be made of buildings or renovation projects undertaken prior to 1978. Building design specifications and construction drawings, if available, can identify known ACM. A physical visit to building areas suspected of containing asbestos must be made if a product name and description cannot be readily identified. Boiler and mechanical rooms typically contain heavy concentrations of insulating materials commonly used on equipment, boilers, pipes and ductwork containing hot or cold fluids. The insulating material may be a chalky mixture of magnesia and asbestos covered with fibrous asbestos wrapping, asbestos felt, corrugated paper, or insulating cement. Color is not a positive identifying characteristic; however, yellow or pink insulation wrapped or covered is usually glass fiber rather than asbestos. Elbows and joints of a glass fiber insulation job may contain ACM. Thermal bricks or an asbestos-insulating blanket covered with finish cement or an asbestos millboard may have been used on boilers.

Sprayed or troweled-on surfacing materials may be more difficult to find. Such materials can be recognized as fireproof coatings applied directly to bare steel building frames. If the building structure is open, a thermal insulating coating can be readily identified. If drop ceilings are installed or false wall partitions exist, inspection above the ceilings and behind the walls will be necessary. ACM may also

be used in tank support fireproofing, spray insulation between wall partitions, roof insulation and finishing, tank insulation and insulation coverings for pipes and ducts, fire doors, wall and floor penetration packing, caulking and joint compounds.

Other ACM products may be in sheet or woven form. Examples are fire curtains, electrical cloth, electrical panel partitions, welding screens, roofing felts, shingles (roof and siding), floor tiles, sheet flooring, wallboard and sheet board stock items such as cooling tower slates.

Abatement Practices

Work practice for asbestos contamination abatement and disposal of waste is regulated. The USEPA Office of Pesticides and Toxic Substances provides guidance and information on these activities. These guidelines require tight enclosure of the work area and strict control and containment of fibers. They demonstrate concern for health matters and worker protection.

USEPA recommendations include:

- Providing worker air purifying respirators and protective clothing.
- Constructing airtight containment barriers.
- Using negative-pressure air filtration systems.
- Wetting all ACM prior to removal.
- Containerizing ACM and debris while wet.
- Using post-abatement high-efficiency particulate air (HEPA) filtered vacuuming techniques.
- Using post-abatement inspection and air monitoring to measure asbestos fibers.

Where building structural elements, walls and partitions are in place, temporary enclosures can be built. These temporary enclosures provide a reasonable approach to ACM containment, however, they may frequently involve plastics and lumber. They may negate existing fire detection devices and sprinkler protection. They may block extinguishers and hose connections, obstruct entrances and exits, obstruct communication devices, and create unnecessary exposures. To reduce the release of fibers to the outside, negative pressure HEPA filtered vacuum systems are often used. If a fire destroys the HEPA filters, fibers can be disposed throughout the premises.

Fire Protection During Abatement

Fire officials of many cities, such as Boston, MA; San Francisco, CA; and Los Angeles, CA, initiated "local" building codes as a result of fire hazard concerns with ACM abatement. Typically, these codes enforce fire regulations upon asbestos clean-up contractors by requiring:

- Fire resistive or noncombustible construction materials.
- Limited size abatement project areas.
- Removal of rubbish daily.
- Maintenance of existing fire/smoke detection systems.
- Maintenance of existing sprinkler protection.
- Provision of portable fire extinguishers.
- Fire watch for hot work.
- Maintenance of access and exit ways.

Permits and postings of abatement project areas are required, and inspections by fire officials are authorized.

Remediation Plan

Extremely costly cleanup and substantial delay in salvage and restoration of business can result if in-place ACM are disturbed or damaged in an incident such as fire, explosion, earthquake or collapse. If removal is feasible, a planned asbestos abatement project during a normal operating period will minimize or eliminate a crisis clean-up project after any such incident.

The physical condition of building structures following a fire or explosion will be questionable and there may not be a practical way to contain asbestos.

A pre-disaster building inspection to locate and characterize the presence of ACM should record the form, use, condition, quantity and location on premises. The records of the survey should be duplicated and stored in separate, sprinklered locations. A review of the survey data should be made.

Management will need to define the work that can be performed by company personnel and the point at which an outside specialty contractor will be needed. Sources and availability of worker protective equipment, as well as ACM handling and disposal materials, need to be arranged. Items, such as personal protective gear, vacuum equipment, special disposal containers and air sampling devices, should be obtained.

A specialty contractor should be used for abatement projects involving reportable ACM, because of the nature of the clean-up work, the many requirements for containment and control of asbestos, the special equipment needs, fire prevention and control and worker protection requirements. The contractor should not be relied upon to report ACM release to the USEPA. The regional office of USEPA and local code enforcement offices should be identified and listed with the plant pre-emergency plan documents. Contract specifications should clearly outline the scope of the abatement project in the pre-performance stage.

In the case of a pre-fire negotiation for a post fire cleanup, the contractor should be made aware of the kinds, amount and location of ACM which may be damaged or disturbed in fire or explosion. A damage scenario should estimate damage to building and project potential cleanup difficulties. An estimate of the manpower and equipment should also be made.