OCCUPATIONAL EXPOSURE TO ASBESTOS (1910.1001)

I. Introduction

Asbestos is a mineral based material that is resistant to heat and corrosive chemicals. Typically, asbestos appears as a whitish, fibrous material which may release fibers that range in texture from coarse to silky. Airborne fibers that can cause health damage may be too small to see with the naked eye.

An estimated 1.3 million employees in construction and general industry face significant asbestos exposure on the job. Heaviest exposures occur in the construction industry, particularly during the removal of asbestos during renovation or demolition. However, other employees in general industry may also be exposed to asbestos. For example, janitorial and maintenance staff may be exposed to asbestos during the maintenance or removal of flooring that contains asbestos. In addition, mechanics may be exposed to asbestos during brake and clutch repairs.

Exposure to asbestos can cause asbestosis (scarring of the lungs resulting in loss of lung function that often progresses to disability and to death); mesothelioma (cancer affecting the membranes lining the lungs and abdomen); lung cancer; and cancers of the esophagus, stomach, colon, and rectum.

The OSHA Standard on Occupational Exposure to Asbestos was revised in 1994 to help further reduce or eliminate workplace exposure to asbestos which is a health hazard. This session will provide a general overview of the revised standard with a special emphasis on those aspects that have special relevance for the cleaning and maintenance products industry: brake and clutch repair; maintenance of floor tile containing asbestos; and training for housekeepers.

II. Exposure Limits

The revised standard established new reduced exposure limits for employees.

A. Permissible Exposure Limit. The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter of air as an 8 hour time weighted average.

B. Excursion Limit. The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air as averaged over a sampling period of 30 minutes.

III. Exposure Monitoring

In general, covered employers must make determinations of employee exposure from breathing zone air.
samples that are representative of the 8 hour TWA and 30 minute short term exposures of each employee. (Note: monitoring does not need to be conducted when performing maintenance operations on flooring containing asbestos, nor when repairing brakes and/or clutches provided that prescribed work practices and engineering controls are being followed.)

A. Initial Monitoring. Covered employers must perform initial monitoring of employees who are, or may reasonably be expected to be exposed to airborne concentrations at or above the TWA permissible exposure limit and/or excursion limit.

B. Periodic Monitoring. After initial monitoring, periodic monitoring must be conducted with “...such frequency and pattern as to represent with reasonable accuracy the levels of exposure of the employees. The intervals of periodic monitoring may not be more than 6 months if exposures may reasonably be foreseen to exceed the PEL or EL.

C. Cessation of Monitoring. The employer may discontinue monitoring if the results indicate that employee exposures are below the PEL and EL. Additional monitoring may be required whenever there is a change in the production, process, control equipment, personnel or work practices that may result in new or additional exposures exceeding the PEL and/or EL.

D. Employee Notification. Affected employees must be informed of monitoring results within 15 working days after any monitoring has occurred, either individually, or by posting the results in an accessible area. If the results indicate that employee exposure exceeded the PEL and/or EL, then the employer also must state what corrective actions have been initiated to rectify the problem.

IV. Regulated Areas

Employers must establish “regulated areas” wherever the airborne concentrations of asbestos exceed the PEL and/or EL.

A. Access. Only authorized persons may enter the regulated area (i.e., those required by work duties to be present in the area).

B. Demarcation. Regulated areas shall be demarcated from the rest of the workplace in any manner that minimizes the number of persons who will be exposed to asbestos.

C. Respirators. Each person entering a regulated area shall be supplied with and required to use a respirator.

D. Prohibited Activities. The employer shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated areas.
E. **Warning Signs.** Employers must post warning signs at each regulated area in addition to all approaches to regulated areas so that employees may read the signs and take necessary protective steps before entering the area. (See 1910.1001(j)(3) for content of warning signs.)

V. **Methods of Compliance**

To the extent feasible, employers shall institute engineering controls and work practices to reduce and maintain employee exposure to or below the PEL and/or EL.

A. **Local Exhaust Ventilation.** Local exhaust ventilation and dust collection systems must be designed, constructed, installed, and maintained in accordance with ANSI Standard, *Fundamentals Governing the Design and Operation of Local Exhaust Systems*, ANSI Z9.2.

B. **Particular Tools.** All hand operated tool and power operated tools which would produce or release fibers of asbestos (i.e., saws, scorers, abrasive wheels, and drills) shall be used with local exhaust ventilation.

C. **Wet Methods.** Insofar as practicable, asbestos shall be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state sufficient to prevent the emission of airborne asbestos fibers.

D. **Particular Products and Operations.** No asbestos cement, mortar, plaster, or similar material containing asbestos shall be removed from bags, cartons, or other containers in which they are shipped without being wetted, or enclosed, or ventilated so as to prevent the release of airborne fibers of asbestos.

E. **Compressed Air.** Compressed Air shall not be used to remove asbestos unless it is used in conjunction with a ventilation system which captures the dust cloud created by the compressed air.

F. **Maintenance of Flooring.** The following procedures shall be adhered to when conducting maintenance operations on floor tile containing asbestos.

   1. **Presumption of Asbestos.** The OSHA asbestos standard requires that employers presume that floor tile and resilient flooring installed no later than 1980 contains asbestos unless the employer demonstrates that the flooring materials do not contain asbestos by using recognized analytical techniques.

   2. **Sanding.** Sanding of asbestos containing flooring material is prohibited.
3. **Stripping.** Stripping of floor finishes shall be conducted using low abrasion pads at speed lower than 300 rpm and wet methods. (EPA has also issued guidelines for the stripping of floor tile containing asbestos. These guidelines are attached as an appendix.)

4. **Burnishing.** Burnishing or dry buffing may be performed only on asbestos containing flooring which has “sufficient” finish so that the pad cannot contact the asbestos containing material. (Sufficient finish generally is considered to be at least 3 coats of finish. If the manufacturer’s instructions specify more than 3 coats, those instructions must be followed.)

**G. Removal of Floor Tile.** In removing floor tile containing asbestos, the floor must first be HEPA-vacuumed. The floor tiles then must be carefully pried up individually after being wetted. Misting is sufficient if the tiles are removed intact. After removal, each tile must be placed in an impermeable trash bag or other impermeable waste container. Additional procedures are set forth in OSHA Instruction CPL 2-2.63 beginning at page C-28.

**H. Brake and Clutch Repair.** The OSHA standard sets forth specific engineering controls and work practices for brake and clutch repair service. The standard provides for three methods of brake and clutch repair, the first two of which are considered “preferred” methods:

1. **Negative Pressure Enclosure/HEPA Vacuum System Method.**

2. **Low Pressure Wet Cleaning Method.**

3. **Solvent Spray Method.** The OSHA Standard allows employers to use alternative methods that the employer can demonstrate are equivalent to the above methods. OSHA considers the spray-solvent can method is considered by OSHA to be an equivalent method.

   At a minimum, the solvent spray method should include the following procedures: (1) the solvent shall be used to first wet the brake and clutch parts; (2) the brake and clutch parts shall be wiped clean with a cloth; (3) the contaminated cloth shall be placed in an impermeable container, and then either disposed of properly or laundered in a way that prevents the release of asbestos fibers in excess of 0.1 fiber/cc of air; and (4) any spilled solvent or dispersed asbestos shall be cleaned up immediately and not allowed to dry either with a cloth or a HEPA vacuum. Dry brushing during solvent spray operations is prohibited.

4. **Infrequent Brake and Clutch Repair.** For those shops in which brake work is
infrequent, OSHA allows the use of a wet control method as an acceptable work practice. Therefore, in facilities in which 5 or fewer brake jobs or 5 clutch repairs, or some combination totaling 5, are conducted each week, the mechanic/technician may control potential asbestos exposure through the use of a pump sprayer (i.e., bottle) containing water to wet down the drum or clutch housing before it is removed and to control fiber releases during subsequent activities.

The mechanic may use other implements to deliver the water such as a garden hose, however, the resulting wastewater generated must be captured and properly disposed of without allowing it to dry on any surfaces. The spray should be controlled through the use of low pressure to the extent feasible. OSHA believes that the use of a spray bottle or similar device will be adequate to control the dust without generating a large volume of waste water.

5. Brake Inspection. Most inspections of brake shoes involve removing the drum that may contain a substantial number of asbestos fibers. Precautions must be taken against the release of these fibers into the workplace. If the drum is carefully pulled back just far enough to observe the brake shoe and brake components, it is sufficient to thoroughly wet the exterior and around the seam between the brake drum and backing plate. Any dislodged material must be immediately cleaned up.

Blows to the drum with a hammer or similar device to dislodge a rusted in place or frozen drum may cause asbestos fibers to be released. Therefore, beating on the drum is not recommended. For such cases, in shops performing 6 or more brake jobs per week, an enclosure must be installed around the drum to capture the dust or the drum interior must be thoroughly wetted prior to striking or forcibly removing the brake drum. The inspection shall be done in accordance with either the preferred or equivalent methods. When using the equivalent spray solvent method, first wet the interior and contents of the drum before striking it. Then carefully pull the drum back just enough to allow another application of solvent and thoroughly wet the interior before removal of the drum.

6. Appendix F. In general, brake and clutch repairs should follow the procedures set forth in Appendix F to 1910.1001.

VI. Respirators

In general industry and construction, where employees are exposed or likely to be exposed to asbestos in excess of the PEL and/or EL, respirators are required. The level of exposure determines what type of respirator is required (See 1910.1001(g)).
VII. Protective Work Clothing and Equipment

For any employee exposed or likely to be exposed to airborne concentrations of asbestos that exceed the PEL, the employer must provide and require the use of protective clothing such as overalls, or similar full body clothing, head coverings, gloves, and foot coverings. Wherever the possibility of eye irritation exists, face shields, vented goggles, or other appropriate protective equipment must be provided and worn.

VIII. Hygiene Facilities and Practices

Clean change rooms must be provided by employers for employees who work in areas where exposure is above the PEL and/or EL. Two lockers or storage facilities must be furnished and separated to prevent contamination of the employee’s street clothes from protective work clothing and equipment. Showers must be provided so that employees may shower at the end of the work shift. Employees must enter and exit the regulated area through the decontamination area.

The equipment room must be supplied with impermeable, labeled bags and containers for the containment and disposal of contaminated protective clothing and equipment.

Lunchroom facilities for those employees must have a positive pressure, filtered air supply and be readily accessible to employees. Employees must wash their hands and face prior to eating, drinking, or smoking. The employer must ensure that employees do not enter lunchroom facilities with protective work clothing or equipment.

IX. Communication of Hazards to Employees

The OSHA standard requires that employees who may be exposed to asbestos be forewarned about the presence of and hazards associated with exposure to asbestos. Asbestos exposure in general industry occurs in a wide variety of industrial and institutional settings. Employees who repair and replace automotive brakes and clutches may be exposed to asbestos fibers. In addition, employees engaged in housekeeping activities in institutional and commercial buildings with installed asbestos containing materials may be exposed to asbestos fibers. All such employees should be afforded the protections of the standard’s hazard communication provisions as set forth below.

A. Presumption of Asbestos. Employers and building owners are required to treat installed thermal system installation and sprayed on and troweled on surfacing materials installed no later than 1980 as asbestos containing material (ACM). Resilient floor tiles and flooring installed no later than 1980 must also be treated as ACM. The employer or building owner may
demonstrate that such materials do not contain asbestos by using acceptable analytical methods.

B. Inform. Building and facility owners shall inform employers, and employers shall inform employees who will perform housekeeping activities in areas which contain ACM of the presence and location of ACM. Building owners/employers shall use due diligence in identifying the presence of asbestos containing material and in informing employers and employees.

C. Warning Signs and Labels. Warning signs shall be provided and displayed at each regulated area and all approaches to such regulated areas.


2. Warning Labels. Warning labels shall be affixed to all raw materials, mixtures, scrap, waste debris, and other products containing asbestos fibers, or to their containers. Such labels shall contain the information set forth at 1910.1001(j)(4)(ii).

3. Posting of Signs and Labels on Installed Asbestos Products in a Building. Signs and labels for installed asbestos products is a performance oriented requirement. The degree to which signs and labels are required depends on the exposure potential, access to the asbestos product, and the hazard of the material.

In general, signs and labels are required to be posted on or near the asbestos containing product. However, it is generally not feasible to put labels on walls or floors, therefore, alternatives may be used. For example, if asbestos containing floors are being services by employees using a common equipment room day after day, then a sign or label for the asbestos flooring can be posted in the equipment room. In the alternative, the label could be posted on the buffing machine which is used by the employees. Remember, the goal is to forewarn employees who may be potentially exposed during the floor cleaning operation.

D. Employee Information and Training.

1. Exposed Employees. The employer shall institute a training program for all employees who are exposed to asbestos fibers at or above the PEL and/or EL. Training shall be provided prior to or at the time of initial assignment and annually thereafter. The training program shall be conducted in a manner in which the employee is able to understand and address the elements set forth at 1910.1001(j)(7)(iii).
2. **Housekeeping Staff.** Employers shall provide an asbestos awareness program at no cost to employees who perform housekeeping operations in a facility which contains ACM at least once a year. Although OSHA sets no time limits for such training, employers may wish to emulate the two hour training program required by EPA for school custodial staff. (Please see the attached list of EPA regional contacts for asbestos.) The OSHA asbestos awareness program shall contain the following elements:

a) Health effects of asbestos;

b) Locations of ACM in the building/facility;

c) Recognition of ACM damage and deterioration;

d) Requirements in this standard relating to housekeeping; and

e) Proper response to fiber release episodes.

X. **Housekeeping**

Employers shall ensure that all surfaces shall be maintained as free as practicable from accumulation of dusts and wastes containing asbestos. All spills and sudden releases of ACM shall be cleaned up as soon as possible. Surfaces contaminated with asbestos may not be cleaned by the use of compressed air.

When vacuuming, HEPA filtered vacuuming equipment shall be used. Dry sweeping and dry clean up of asbestos may be used only when vacuuming and/or wet cleaning are not feasible.

Waste, scrap, debris, bags, containers, equipment, and clothing contaminated with asbestos consigned for disposal shall be collected and disposed of in sealed impermeable bags or other closed impermeable containers.

XI. **Medical Surveillance**

Employers shall institute a medical surveillance program for all employees who are or will be exposed to concentrations of asbestos at or above the PEL and/or EL. (See 1910.1001(l)).

XII. **Recordkeeping**

The OSHA asbestos standard also requires employers to maintain records addressing four areas: exposure assessments; objective data for exempted operations; medical surveillance; training. See
1910.1001(m) for a detailed description of the records that must be maintained.