

Occupational Asbestos Exposures in Construction

American Industrial Hygiene Association (AIHA) – Hawaii Section
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Topics

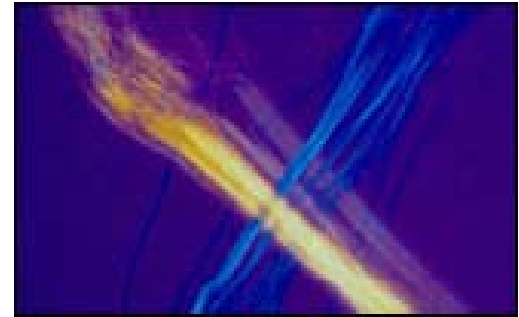
- ▶ Health Hazards of Asbestos
- ▶ Construction Asbestos Standard 29 CFR 1926.1101
 - ▶ Scope and Application
 - ▶ Definitions
 - ▶ Multi-Employer Worksites
 - ▶ Regulated Areas
 - ▶ Exposure Assessments and Monitoring
 - ▶ Methods of Compliance
 - ▶ Engineering Controls
 - ▶ Class I work
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Topics (Continued)

- ▶ Respiratory Protection
- ▶ Protective Clothing
- ▶ Hygiene Facilities and Practices for Employees
- ▶ Communication of Hazards
- ▶ Labels
- ▶ Employee Information and Training
- ▶ Housekeeping
- ▶ Medical Surveillance
- ▶ Recordkeeping
- ▶ Competent Person
- ▶ Appendix A – Mandatory – OSHA Reference Method
- ▶ Appendix D – Mandatory – Medical Questionnaire
- ▶ Appendix E – Mandatory – Interpretation of Chest X-rays

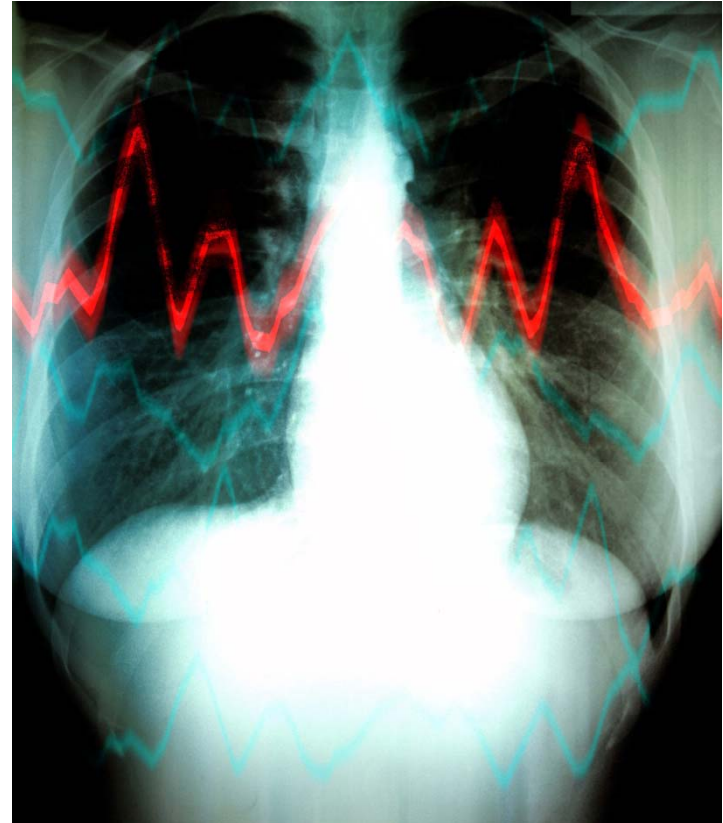
What is Asbestos?

- ▶ A generic term for a group of naturally occurring fibrous minerals
 - ▶ Chrysotile, Crocidolite, Amosite, Anthophyllite, tremolite, and Actinolite.
- ▶ Wonder Fiber –
 - ▶ High tensile strength
 - ▶ Flexibility
 - ▶ Resistant to heat, chemicals and electricity
- ▶ Used extensively for fireproofing



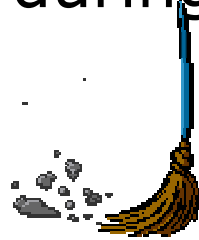
Health Hazards

- ▶ Asbestosis
- ▶ Lung Cancer
- ▶ Mesothelioma
- ▶ Gastrointestinal Cancer



Asbestos can enter the body through:

Inhaling asbestos fibers during demolition of buildings containing asbestos



Ingesting asbestos fibers on your hands from eating, drinking or smoking while working with or near asbestos fibers.



Asbestos must be “Friable” to be dangerous

- ▶ Potential to release breathable fibers
- ▶ Can be crumbled with hand pressure
- ▶ Asbestos bound tightly in a matrix such as Vinyl Asbestos Tile, asbestos cement pipe, or roofing felt is not friable if intact
- ▶ Disturbing the matrix can release fibers:
 - ▶ Sawing
 - ▶ Sanding
 - ▶ Other “aggressive” operations

29 CFR 1926.1101 – Construction Work

- ▶ Construction Work – not same as construction industry
- ▶ Definition: Work for construction, alteration and/or repair, including painting and decorating.
- ▶ Includes:
 - ▶ Demolishing or salvaging structures where asbestos is present
 - ▶ Removing or encapsulating asbestos-containing material (ACM)
 - ▶ Constructing, altering, repairing, maintaining, or renovating asbestos-containing structures or substrates
 - ▶ Installing asbestos containing products
 - ▶ Cleaning up asbestos spills/emergencies
 - ▶ Transporting, disposing, storing, containing, and housekeeping involving asbestos, or asbestos-containing products on a construction site.
 - ▶ Does NOT apply to asbestos-containing asphalt roof coatings, cements, and mastics

Significant Definitions

Definitions are very
Important!!

- ▶ **Asbestos** is also “Presumed Asbestos Containing Material” (PACM)
- ▶ **Asbestos Containing Material (ACM)** means any material containing more than one percent asbestos
- ▶ **PACM** means thermal system insulation and surfacing material found in buildings constructed no later than **1980**
- ▶ **Aggressive method** means removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles or disintegrates intact ACM
- ▶ **Disturbance** means activities that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM.

Work Classification

- ▶ 4 classifications from Class I to IV & **Unclassified**
- ▶ Class I is most hazardous
- ▶ Different requirements for each Class
- ▶ Publication 3096 has Quick Reference Chart

	Class I	Class II	Class III	Class IV
Definition	~~~~	~~~~	~~~ ~~~	~~~ ~~~
Regulated Area	~~~	~~~~		
Competent Person				
Air Monitoring				

Class Definitions -Presumption

Class	Definition
Class I	Removal of thermal system insulation (TSI) and surfacing material (SM) containing >1% asbestos
Class II	Removal of material other than TSI or SM containing > 1% asbestos
Class III	Maintenance and repair operations disturbing material containing > 1% asbestos
Class IV	Housekeeping and custodial cleanup of dust, waste, and debris from Class I, II or III activities

Note: Material containing < 1% asbestos is still asbestos and the standard is triggered. THIS is “Unclassified work”

Provide examples of work you are familiar with that are:

- ▶ Class I -
- ▶ Class II -
- ▶ Class III -
- ▶ Class IV -

Rebutting the Presumption – (k)(5)

- ▶ Having a completed inspection conducted pursuant to the requirements of AHERA (40 CFR Part 763, Subpart E), which demonstrates that the material is not ACM; or
- ▶ Performing tests of the material containing PACM which demonstrate that no ACM is present in the material.
 - ▶ Tests must be done by accredited inspector or a CIH
 - ▶ Analysis by proficient laboratory (NVLAP or NIST or AIHA round robin)
 - ▶ Recognized analytical methods of flooring showing no ACM.

So if you have successfully rebutted the presumption of ACM or PACM, can you do nothing?

- ▶ **NO – See Interpretation A-1 (11/24/03 – Varga)**
- ▶ **The following are still applicable:**
 - ▶ (f)(2)(i) – initial exposure assessment by competent person
 - ▶ (g)(1)(ii) – requires wet methods or wetting agents to control exposures
 - ▶ (g)(1)(iii) – prompt clean-up and disposal of wastes and debris
 - ▶ (g)(3)(i) – prohibits use of high-speed abrasive saws without point of cut ventilator or HEPA enclosures
 - ▶ (g)(3)(ii) – prohibits use of compressed air – unless capture exhaust system is used
 - ▶ (g)(3)(iv) – prohibits employee rotation as means of reducing exposure

So not ACM or PACM, and < PEL:

Must perform exposure monitoring!!!!

- ▶ (f)(2)(i) - Competent person still required to conduct an exposure assessment to determine if < PEL
- ▶ (f)(6)(i) – employee opportunity to observe monitoring
- ▶ (f)(5)(i) – notify affected employees of monitoring results as soon as possible
- ▶ (f)(5)(ii) – Notification in writing or by posting in central location
- ▶ (n)(2)(i) – (iv) – recordkeeping of exposure measurements

Competent Person

- ▶ “In addition to the definition in §1926.32(f), one who is:
 - ▶ Capable of identifying existing asbestos hazards in the workplace, and
 - ▶ Selecting the appropriate control strategy for asbestos exposure
 - ▶ Who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f)
 - ▶ For Class I and Class II work – is specially trained in a training course which meets EPA’s Model Accreditation Plan for supervisor, or its equivalent
 - ▶ For Class III and Class IV work – is trained in manner consistent with EPA requirements as set forth at 40 CFR 763.92(a)(2)

Competent Person 1926.1101(o)

	Class I	Class II	Class III	Class IV
Onsite	Yes	Yes	Yes	Yes
Inspection	Each worksite	Often	Often	Often
Training	Supervisory	Supervisory	O & M	O & M
Regulated Area	Supervise	Supervise	Supervise	Supervise

Additional inspections for all work classes:
employee request

At any time at

Multi-Employer Worksites

- ▶ **Name the 4 types of employers**
 - ▶ Controlling
 - ▶ Creating
 - ▶ Correcting
 - ▶ Exposing
- ▶ **Employer w/Regulated Area must inform other employers of:**
 - ▶ the nature of the work with asbestos or PACM,
 - ▶ Regulated area requirements
 - ▶ Measures to protect other workers

Multi-Employer Worksite (cont)

- ▶ Abatement responsibility with Er who created or controlled source of asbestos contamination
- ▶ All workers with Ee exposure must comply with applicable provisions to protect their employees
- ▶ If work adjacent to regulated area established by another – must take steps on daily basis to ascertain the integrity of the enclosure and/ or the effectiveness of the control method.
- ▶ **General contractor responsibility to oversee compliance with subs**

Even if the general does not employ the “competent person”

Exposure Assessment & Monitoring (f)

- ▶ “Each employer who has a workplace or work operation covered by this standard shall ensure:
 - ▶ A competent person conducts an exposure assessment
 - ▶ Immediately before or at the initiation of the operation

- ▶ “Covered by this Standard”
 - ▶ Asbestos – meets definition
 - ▶ Contains any amount of asbestos, even < 1%

Exposure Assessment (o)

- ▶ Employee exposure – not area samples
- ▶ Breathing zone
- ▶ Full shift for 8-hour TWA (PEL is 0.1 fiber/cc)
- ▶ Several representative 30-minute (1.0 fiber/cc)
- ▶ OSHA Reference Method (Appendix A) is mandatory
 - ▶ TEM alone not equivalent or acceptable (Interp A-5)
 - ▶ Flow rate, 25 mm cassette: 0.5 liters/min – 2.5 liters/min
OSHA does not accept 10 liters/min (EPA clearance) (Interp A-2)

Negative Exposure Assessment (NEA)

- ▶ 1926.1101(f)(2)(iii)
- ▶ Objective data – demonstrating that product or material cannot release asbestos fibers in concentrations exceeding PEL and excursion limit under those work conditions **having the greatest potential** for releasing asbestos
Not the same as same or similar to current job
- ▶ Past monitoring – “closely resembling” including training and experience of workers
- ▶ Results of initial monitoring of current job – Worst case would not exceed PEL or excursion limit

Exposure Assessment

- ▶ Employee notification of monitoring results (f)(5)
- ▶ Employee right to observe (f)(6)
- ▶ Recordkeeping (n)
 - ▶ Objective data
 - ▶ Exposure measurements
 - ▶ Medical surveillance
 - ▶ Training records
 - ▶ Data to Rebut PACM
 - ▶ Records of Required Notifications (building owner)
 - ▶ Availability – to affected employees and to OSHA/HIOSH

Nearly always deficient

Methods of Compliance (g)

- ▶ For all operations covered by this section (Interp A-1)
 - ▶ Wet methods - (g)(1)(ii)
 - ▶ Prompt clean up and disposal - (g)(1)(iii)
 - ▶ Prohibit high-speed abrasive saws not equipped with point-of-cut ventilator or enclosures with HEPA filtered exhaust air – (g)(3)(i)
 - ▶ Prohibit compressed air – unless proper enclosed ventilation system – (g)(3)(ii)
 - ▶ Prohibit employee rotation as means of reducing employee exposure to asbestos – (g)(3)(iv)

Respiratory Protection (h)

	Class I	Class II	Class III	Class IV
Respirators	Mandatory For all jobs	Mandatory, if	Mandatory, if	Mandatory
		Non-intact removal, or	TSI, or SM disturbed, or	In regulated areas, or
		No NEA, or	No NEA, or	
		> PEL, or	> PEL, or	> PEL, or
		Dry removal, or	Dry removal, or	
		In emergencies	In emergencies	In emergencies

Non classified work – where > PEL or excursion
AND in emergencies

Respiratory Protection Program (h)(2)

- ▶ In accordance with 29 CFR 1910.134(b) through (d) (except (d)(1)(iii)), and (f) through (m)
- ▶ Excludes (e) – which is medical evaluation
- ▶ WHY?
 - ▶ Because medical evaluation already required in (m)(1)(B) Medical Surveillance – for employees otherwise required by this standard to wear a negative pressure respirator, employers shall ensure employees are physically able to perform the work and use the equipment. Physician involvement required.
 - ▶ Medical exams (m)(2) – Prior to assignment where negative pressure respirators are worn
 - ▶ Mandatory Appendix D – questionnaire

Protective Clothing (i)

	Class I	Class II	Class III	Class IV
Protective Clothing	Required for all jobs, if	Required for all jobs, if	Required for all jobs, if	Required for all jobs, if
	> 25 linear or 10 ft ² of TSI, or			
	SM removal, or			
	No NEA, or	No NEA, or	No NEA, or	No NEA, or
	> PEL	> PEL	> PEL	> PEL

Protective Clothing (i)

- ▶ **Laundering**
 - ▶ Shall inform person doing laundering of requirement to prevent release of airborne asbestos in excess of TWA or excursion limit (not need be in writing)
- ▶ **Contaminated Clothing –**
 - ▶ Sealed impermeable bags
 - ▶ Labeled
- ▶ **Inspection of protective clothing by competent person**
 - ▶ At least once per work shift

Hygiene Facilities and Practices

- ▶ Comprehensive and specific requirements for each work class
- ▶ For all - No smoking

Communication of Hazards (k)

▶ Building owners

- ▶ Responsibility to identify presence, location and quantity of ACM, and/or PACM at the worksite (> 1% asbestos)
- ▶ Notification requirement to
 - ▶ Prospective bidders
 - ▶ Owner's employees who will work in or adjacent to areas containing ACM and/or PACM
 - ▶ On multi-employer worksites, all employers performing work within or adjacent to areas containing ACM and/or PACM.
 - ▶ Tenants who will occupy areas containing ACM and/or PACM

Communication of Hazards -

▶ Contractor

- ▶ Communication between contractor and owner and other employers
 - ▶ Within 10 days of job completion
 - ▶ Quantity of ACM and/or PACM remaining
 - ▶ Final monitoring results (not clearance), if any.

▶ Other employers

- ▶ Upon discovery of ACM and/or PACM, inform
 - ▶ Building owner
 - ▶ Other employers
 - ▶ Presence, location, and quantity of ACM and/or PACM
 - ▶ Within 24 hours of discovery

Communication of Hazards

▶ Signs

- ▶ Labels or signs in areas containing PACM and/or ACM
- ▶ Example – Mechanical Room, Boiler room

▶ Employee training

- ▶ Applies to Class Work and if >PEL
- ▶ No Cost to employee
- ▶ Employer shall ensure employee participation
- ▶ Prior to or at time of initial assignment
- ▶ At least annually thereafter.

▶ Smoking cessation program material – for all employees potentially exposed to asbestos.

Interpretations - Asbestos

- ▶ <1% Asbestos Requirements (A-1)
- ▶ “aggressive” work practices not allowed when “non-Aggressive” methods are feasible (A-1) (Hawaii def of “infeasible” is impossible)
- ▶ If use alternative work practices and controls – cannot use objective data – only past monitoring data is allowed to be used by the competent person (A-2)
- ▶ Direct and indirect employees: If past monitoring is used as NEA for direct employees when using alternative work practices – can it also be used for indirect employees?
Answer: No, not automatically (A-2) – Requires competent person evaluation

Interpretations – Asbestos (cont)

- ▶ Overspray of fireproofing is not debris. It's removal is Class I asbestos work (A-3)
- ▶ Definition of “sizable” amount – Competent person evaluate, generally more than 1 standard-sized glove bag or waste bag (A-3)
- ▶ Major abatement project under Class I, left sizable amount of debris. 6 months later – can clean up be Class IV? No – Should have been cleaned up promptly, material is sufficiently disturbed to still be Class I work. (A-3)
- ▶ If no monitoring done for <1% asbestos and no NEA, then until monitoring results – must comply as if PEL and Excursion limit exceeded. (A-4)

Interpretations – Asbestos (cont)

- ▶ Transmission Electron Microscopy (TEM) not acceptable, only ORM (A-5)
- ▶ Can building with ACM left in place be demolished? Yes, but now Class I work and HUGE amount of asbestos waste. (A-7)
- ▶ Sheetrock containing $<1\%$ asbestos removal – must also determine % asbestos for joint compound, spackling, tape, etc. If any are $>1\%$ - then Class II work. If all $<1\%$ - unclassified asbestos work. (A-9)