Asbestos Awareness

OSHA Class IV Training

ASBESTOS AWARENESS
OSHA Class IV Training
by The Asbestos Institute

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First Edition

Printed in the United States of America

TABLE OF CONTENTS

Introduction

This information manual meets the requirements of OSHA for Class IV asbestos training and of EPA for Asbestos Awareness. The intended concept in both cases is for "communication of hazards" to employees who may come in contact with asbestos containing building materials (ACBM). This training does not allow the employee to disturb the ACBM, but to conduct normal custodial work that may require contact with the material. Examples would be mopping a floor covered with asbestos containing floor tile or wiping a surface material which contains asbestos. These activities do not pose an asbestos exposure hazard to the employee. However, he has a legal right to know about hazardous chemicals in his workplace, in this case asbestos.

ACBM is in most buildings in the United States. ACBM is simply a manufactured construction material containing more than 1% asbestos. The vast majority of perhaps 3000 different ACBM's are what OSHA would call "intact" material. This means that the fibers of asbestos are bound in the matrix of the ACBM, and cannot float in the air. The ACBM poses no health threat by itself. The only potential asbestos health threat is the inhalation of airborne asbestos fibers. Historically, the inhalation of asbestos fibers most likely to cause a disease is very prolonged exposure to high levels of

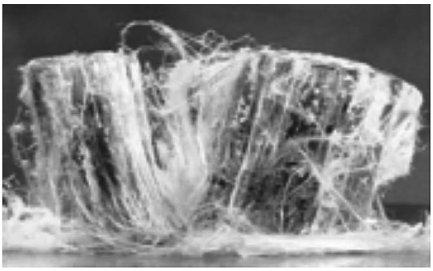
generated airborne asbestos. This has been documented most notably in the processing of the asbestos mineral, in the asbestos manufacturing industry and in the application of some materials such as fireproofing and pipe insulation. These activities have not been done in the US for almost 40 years, and are not likely to be done in the future.

By the end of the 1970's, EPA had legally banned the use of "high risk" material such as fire proofing, spray applied "popcorn" ceilings and asbestos containing pipe insulation. Asbestos inspections are required before demolition and renovation of buildings, but are not required for the normal operation of public, commercial and industrial buildings. However, OSHA, in 1994 promulgated our current construction standard for asbestos, which presumes ACBM for any "friable" (easily crumbled) surfacing such as fireproofing or popcorn ceilings, any pipe, tank or boiler insulation and any asphalt or vinyl flooring material in buildings constructed through 1980 (before 1981) and requires the building owner to inform outside contractors who may work in his building, his own employees and commercial tenants of the presence of these "presumed" materials. OSHA also classifies normal custodial work that may contact ACBM or PACM (Presumed Asbestos Containing Material) as Class IV work and requires training for employees who do this work.

This Brief informational training fulfills that OSHA requirement for training and also training for school custodians under EPA's AHERA regulation. Owners must add to this training, information on the presence, location and quantity of these presumed materials in the building.

CHAPTER 1:
BACKGROUND AND HISTORY

WHAT IS ASBESTOS?



Asbestos is a fibrous crystalline mineral naturally occurring in the crust of the earth. It is naturally indestructible in the environment. It is not affected by natural heat, chemicals, or biological degradation. It naturally "cleaves" or separates into smaller and smaller "fibrils" when disturbed. Chrysotile, the asbestos type that makes up about 95% of the asbestos used in the US, will cleave lengthwise indefinitely. That means that the fibrils of chrysotile are sub-microscopic. It is also naturally aerodynamic, meaning it will naturally entrain and float in the moving air indefinitely.

There are 3 commercially used types of asbestos in the US: Chrysotile, amosite, and crocidolite. Amosite and crocidolite were imported from South Africa early in

our use of asbestos, but have not been imported for many years. Chrysotile is found and mined extensively in North America, resulting in it being the common asbestos used in the US. There are also many contaminant types of asbestos that are found in conjunction with other minerals.

WHY HAVE WE USED ASBESTOS IN CONSTRUCTION MATERIALS?

PROPERTIES OF ASBESTOS:
HEAT RESISTANCE
BIOLOGICAL RESISTANCE
INCOMBUSTABILITY
WATER RESISTANCE
SOUND ABSORPTION
BACTERIAL RESISTANCE
FRICTION RESISTANCE
ELECTRICAL RESISTANCE
MECHANICAL STRENGTH
CHEMICAL (ACID) RESISTANCE
WEARABILITY

Asbestos can add all of the enhancements of the column above, and will not degrade or break down. It lasts indefinitely in the environment, as it always has.

HISTORY OF ASBESTOS USE

Written documentation of asbestos use goes back at least 2500 years into ancient Greece, where it was used much like any fiber being woven into fabrics. It was used in lamp wicks that would not burn up, and different fireproof cloths. Our word "asbestos" comes from the Greek, meaning inextinguishable or unquenchable. Our earliest written knowledge of health effects from asbestos exposure was documented about 2000 years ago.

The US became a country in the middle to late 1700's, and was largely agrarian, having little use for this mineral or the knowledge of it. However, in about the middle 1800's, the industrial nations of the world entered the "Industrial Revolution". Steam was harnessed as a power source which revolutionized all manufacturing and industrial activities. Steam generation required high temperatures and pressure, which had to be controlled. The use of asbestos in this capacity was a natural development, and mining and demand for the mineral developed together. The asbestos industry was born.

The first major use of asbestos in the US was thermal insulation on mechanical systems that generated and used steam. This use is known today as Thermal System Insulation or "TSI". This includes insulation on pipes, tanks, ducts, boilers and any other component of

mechanical systems. In the construction industry, the next major use was compounds such as plasters and cements by about 1920. By about 1930, we had "transite" or asbestos cement products like pipe, panels, shingles and siding. By 1935, the industry developed spray applied asbestos products used mostly as fireproofing on structural beams and components of multi-story construction.

These were the major uses before World War II. During the war years, the US government paid incentives for the production of asbestos needed for the war effort, and the mining and asbestos supply industry grew exponentially. The war ended in 1945, and the government contracts supporting this growing industry ended. The industry was forced to look for new avenues of sales. So with much research and development, asbestos began to be used in architectural finishes such as flooring, walls, ceilings, sealants, mastics and many other construction uses, as well as consumer products. By 1975, EPA estimated that asbestos was being used in over 3600 different products.

THE "WINDOW IN TIME" FOR ASBESTOS IN CONSTRUCTION

The window in time when most different asbestos products were used in construction was about 1950 through about 1980. This period in time is when the

"construction boom" took place after the Second World War. A majority of the buildings in the US were constructed during this period. The beginning of the window was 1950 for the reasons listed above, and the end of the window was 1980 for two reasons, EPA bans on the use of certain asbestos products by 1978 and plaintiff litigation against asbestos manufacturers at about the same time.

By the middle 1970's the US began to have a heightened awareness of the health effects of occupational exposure to asbestos. This triggered both the bans by 1978 and the litigation issue. This in turn resulted in very focused asbestos regulations from the middle 1980's to the middle 1990's. We will discuss both the health effects of asbestos exposure and the regulations in the next two subsequent chapters.

CHAPTER 2:
HEALTH EFFECTS OF ASBESTOS EXPOSURE

A HAZARDOUS AIR POLLUTANT

Asbestos is a hazardous air pollutant. It is an inhalation hazard in humans. It is an airborne human carcinogen. In most cases, it causes health effects in humans if they are exposed to the airborne fibers in a high concentration for a long period of time.There are two very different exposure hazard situations for humans: Passive exposure hazards and occupational exposure hazards.

Passive exposure may be described as exposure to the normal background air that we all breathe. As mentioned in Chapter 1, asbestos is in the crust of the earth, so it has become entrained in the atmosphere of the earth. There is always a measurable level of asbestos in the air that we breathe. Very few people develop health effects from this exposure, but it is possible. People with very compromised immune systems may be susceptible to a disease called mesothelioma from this ambient exposure. However, it depends on the level of asbestos in this ambient air. Large cities like New York could have very different ambient asbestos levels than a rural town in Midwest. As an example, ambient air levels

measured in the city of Phoenix, AZ are in the area of 0.0006 fibers per cubic centimeters (f/cc). Before compliance with our current EPA National Emissions Standard for Hazardous Air Pollutants (NESHAP), ambient air levels in New York City were measured in the vicinity of 0.2 f/cc. This is a huge difference to the compromised individual mentioned above. However, this is not a measurable source of asbestos disease.

Occupational exposure is much easier to identify and measure, and is the source of most asbestos disease. Occupational exposure is the exposure to asbestos that you would have if you worked in the asbestos manufacturing industry in the 1950's. It is exposure from how you make your living – all day every day for a working career. This exposure usually resulted in asbestos disease that resulted in early mortality.

This type of occupational exposure was ended in the US over 40 years ago (at least by the end of the 1970's). In fact the occupational exposures most responsible for early mortality in this country, manufacturing and installation of asbestos materials, has been "outlawed" by a combination of regulation and litigation by 1980. The occupational exposure that remains, for the most part, is in the construction industry. This exposure is to construction workers and is the result of remodels, renovations and demolitions of existing buildings in this country that disturb Asbestos Containing Building Materials (ACBM).

In spite of required controls in the construction industry, asbestos exposure is very difficult to control. This exposure is to something that you cannot see, taste or smell. If you are exposed to it, we cannot determine that exposure has taken place in your body. The only way we know that a person has been exposed is to diagnose a disease in that person. This diagnosis can only happen at the end of a 20-30 year latency period. A latency period is the time lag between exposure to a substance that causes a disease and the diagnosis of that disease.

ASBESTOS DISEASES

There are 3 main asbestos diseases: Lung Cancer, Asbestosis and Mesothelioma.

LUNG CANCER

Lung cancer is a cancer or tumor in the interior portion of the lung, associated with the bronchial tubes. It is perhaps the most common of the asbestos diseases, although it is not asbestos specific. This means that it is not caused by asbestos only. It can be caused by any inhaled carcinogen, and it is not possible to determine the causative carcinogen. However, our data on lung cancer by industry shows us that it is at least 10 times more common in the construction industry than any other industry. Asbestos, as a source of occupational exposure, is by far most common in buildings that are disturbed by the construction worker. Lung cancer

develops from a buildup of the carcinogen in the bronchial tubes.

This buildup of fibrous asbestos in the bronchial tubes is not normal. Normally, there is a cleaning mechanism in the bronchial tubes that involves a naturally secreted mucous blanket and the action of cilia cells beneath the blanket that moves it in an upward direction. Inhaled particulate are trapped in the mucous blanket that is moved upward continuously and eventually expelled. The most common way this natural mechanism is disrupted is cigarette smoking. Cigarette smoke stops the action of the cilia. EPA's data tells us that the cigarette smoker that is occupationally exposed to asbestos has at least a 90 times greater chance of contracting lung cancer than the non-smoking, non-occupationally exposed public.

The normal latency period for lung cancer is about 20-30 years.

ASBESTOSIS

Asbestosis is not a cancer, but is a thickening or "scarring" of the pleural membrane at the alveoli level in the respiratory system. This inhibits the normal transfer of oxygen from the air we breathe into the bloodstream. Asbestosis results in oxygen deficiency and eventually death. This thickening or "scarring" of the alveoli membrane is specific to asbestos particulate

contacting the membrane. Normally, special cells clean the membrane of particulate, but cannot ingest asbestos. The only recourse the body has is to seal the particulate in place with layers of cellular material, which renders that microscopic spot unable to let oxygen pass through. With enough "spots", enough oxygen is inhibited to cause death. This is the most common of the diseases caused by occupational exposure. Today, the normal latency period of asbestosis is likely to be about the same as lung cancer (20-30 years). In the days of the 1950's and 60's, the latency was about 15 years.

MESOTHELIOMA

Mesothelioma is a cancer of the mesothelial membrane in the body. Mesothelioma is indeed an "oma" or tumor on this membrane. The mesothelium is found mainly in the chest cavity surrounding the lungs and in the abdominal cavity surrounding the intestines and lower organs. This disease is an asbestos marker disease. As far as we know for certain, it is not caused by anything other than asbestos. The average latency is very long, but it is probably in line with the other asbestos diseases today in the US, about 30 years (usually at the end of a normal lifespan). Mesothelioma is uniformly fatal, usually within a short time after diagnosis.

GENERAL COMMENTS

By far the majority of asbestos disease in the US is from very heavy, on-going occupational exposure. Since that is a thing of the past, for the most part, the incidence of asbestosis mortality is falling off sharply since about 2016.

The incidence of mesothelioma deaths in the US has stayed fairly constant for many years. The source of exposure is in the construction industry, and for non-construction personnel, it is probably related to asbestos in occupied buildings.

CHAPTER 3:
FEDERAL ASBESTOS REGULATIONS

HOW WE GET REGULATIONS

In the US, regulations come from laws that congress passes. Agencies do not make up regulations.

Congress passes a proposed bill into law. The bill then goes to the Executive branch (President) where it gets signed. The bill then becomes public law. The executive branch is responsible to enforce the new law. The executive branch has many agencies working for it. These are enforcement agencies. The new public law is then assigned to an agency that deals with the issues in the new law. If the issues are environmental, it goes to EPA. If the issues are employee safety, it goes to OSHA. The agency then promulgates, or writes and publishes a regulation or set of rules that the public can read and follow that will keep them in compliance with the new law. The regulations that the agency produces must be what congress wrote into the public law. They cannot be more stringent or less stringent. They cannot address issues that congress did not address. A third branch of government, the courts, then oversees the process to keep it in compliance, and to hand down penalties for non-compliance. If the regulation is more stringent than the public law, or addresses

requirements that the bill did not, it cannot be enforced by the courts. The public law is what gives the regulation authority. The main point of all of this is that EPA or OSHA does not make up regulations. Congress does.

OVERVIEW OF THE 4 MAIN ASBESTOS REGULATIONS

Although there are about a dozen federal asbestos regulations, in the asbestos control industry we work with 4 most of the time.

1. "OSHA" – The asbestos standard for the construction industry.
2. "NESHAP" – Demolition and renovation
3. "AHERA" – Asbestos in schools.
4. "MAP" – The Model Accreditation Plan

These 4 regulations are all about their own subject, and they are all different. They may say things differently, but they are never in conflict.

THE OSHA CONSTRUCTION STANDARD FOR ASBESTOS: 29 CFR 1926.1101

This is the most important asbestos regulation for you, the worker. It is meant to protect you from exposure to asbestos on a work site. It gives us easily followed rules that will accomplish that. Compliance with this regulation is an employer responsibility. OSHA does not require

asbestos work to be done, but if it is done, it protects the employee doing the work. Compliance with this regulation is measured and documented with air monitoring data. We cannot do asbestos work without air monitoring data. This proves compliance on the part of the contractor (employer), and that there is no exposure to workers.

OSHA has classified all ACM into 2 classes of materials, Class I materials and Class II materials:

1. Class I materials are high risk materials on a construction site and therefore very heavily regulated with controls.
2. Class II materials are much less risk to work with, therefore much less regulated.

There are only 2 Class I materials: "friable" surfacing and TSI. The term "friable" means that when a material is dry, you can crumble it to a powder by hand pressure. The term "surfacing" is a material that is sprayed on or troweled on. Common Class I surfacing materials are fireproofing and popcorn ceilings. When disturbing Class I materials, respirators and protective clothing are always required. We have discussed TSI before. A typical example is pipe insulation.

All other ACMs are Class II materials. Class II materials make up the vast majority of ACMs in buildings.

OSHA also classified all ACM work under the construction standard into 4 classes of work. Removal of Class I material is Class I Work. Removal of Class II materials is Class II Work. "Disturbance" of either Class I or Class II materials is Class III Work. Class III Work is O&M work. Building custodial workers who come in contact with ACM but do not disturb it, or are doing cleanup of debris that may contain asbestos are doing Class IV Work. OSHA defines training and controls based on class of work.

THE EPA NESHAP REGULATION

The NESHAP regulation is about demolition and renovation activities involving asbestos. It is mainly a waste management regulation. Like OSHA, it regulates friable and TSI ACM. These materials must be removed from a building before demolition or renovation activities disturb it, and the waste stream is regulated through disposal, all for the protection of the public and the environment. This is the only regulation that requires removal of ACM. Where the OSHA regulation regulates all work with ACM, the NESHAP only regulates large work above a threshold amount of regulated material. This would not include maintenance level disturbance. This regulation is the only federal regulation that regulates asbestos waste.

THE EPA AHERA REGULATION

AHERA applies to schools K-12. It is about the safe use of the interior portions of occupied buildings. AHERA addresses 2 important issues: how to do a regulated asbestos building inspection, and the concept of O&M (operations and maintenance).

AHERA requirements apply to friable and TSI ACM. AHERA requires a comprehensive building inspection for asbestos, including all the details of who can do it, how is it done, how many samples to collect, how they are analyzed, what is ACM, what is not ACM and what goes into an inspection report. AHERA gives the building owner 5 options for what must be done with friable and TSI ACM, but the main intent is safe management in place (O&M).

AHERA also gives us the concept of accredited training required for people who must work with or manage friable or TSI ACM. The accredited disciplines are:

1) Building Inspector
2) Management Planner
3) Project Designer
4) Contractor/Supervisor and
5) Worker

THE EPA MODEL ACCREDITATION PLAN (MAP)

The MAP was originally Appendix C of AHERA, giving a description of the certified training required for people who deal with friable and TSI ACM in school buildings.

In 1994, it became its own regulation, and the applicability was extended to all buildings in the US except houses. This means that people who deal with friable or TSI ACM in all buildings in the US (except houses) must be certified. The MAP applies to work with regulated ACM in buildings above the maintenance level of disturbance.

GENERAL ISSUES

What we see, then, in briefly looking at the 4 main asbestos regulations is that not all asbestos is regulated. EPA only regulates the friable and TSI asbestos, and OSHA regulates all asbestos to some extent, but regulates the friable surfacing and TSI much more heavily. Also we see that waste is regulated to some extent and training is required to work with asbestos.

About The Asbestos Institute

Based in Phoenix, Arizona, The Asbestos Institute, Inc. has been providing EPA-accredited training to attendees from all over the world since 1988, the first year of AHERA accredited training in the U.S.

The Asbestos Institute, Inc. is a complete training center, classroom and information resource dedicated to the asbestos, lead abatement and environmental hazard control industry. The Asbestos Institute, Inc. has received full approval from the United States Environmental

Protection Agency for its courses in asbestos management and offers initial EPA accreditation for Contractor/Supervisors, Building Inspectors, Management Planners, and Asbestos Abatement Workers (English and Spanish).

We are accredited by Cal-OSHA to offer California certification to anyone attending an initial or refresher asbestos class.

Annual refresher courses for the Contractor/Supervisor, Inspector and Management Planner are offered monthly in Phoenix, as well as bi-annually in Tucson and Las Vegas. The Project Designer Course is addressed

through annual refreshers with a new initial course now offered!

The Asbestos Institute, Inc. also provides on-site training for clients in AZ, NM, CO, UT, NV, CA, nationally and internationally.

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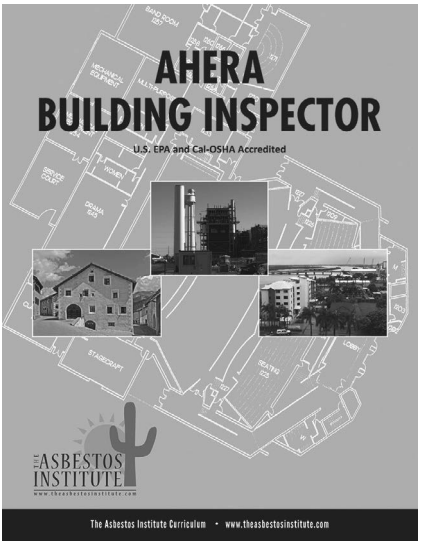

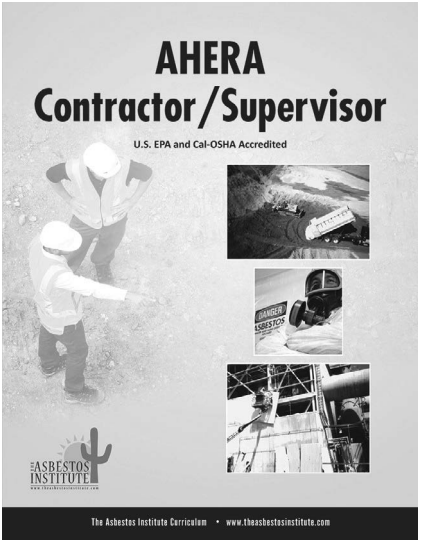

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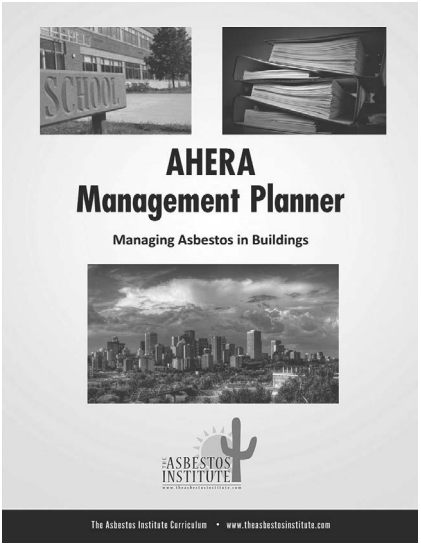

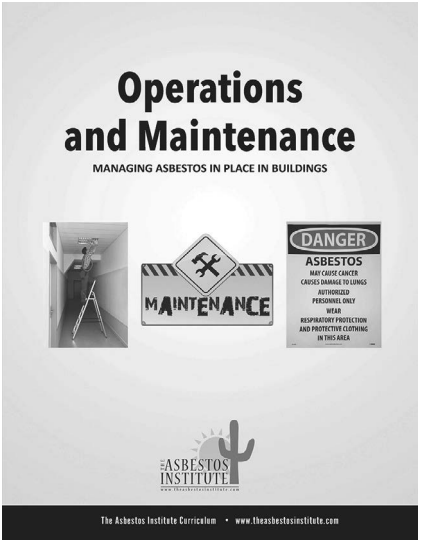

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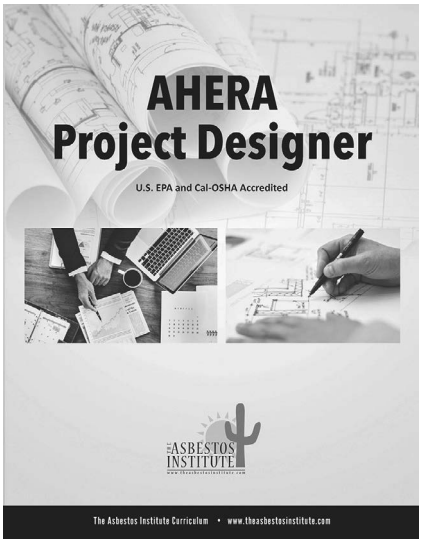

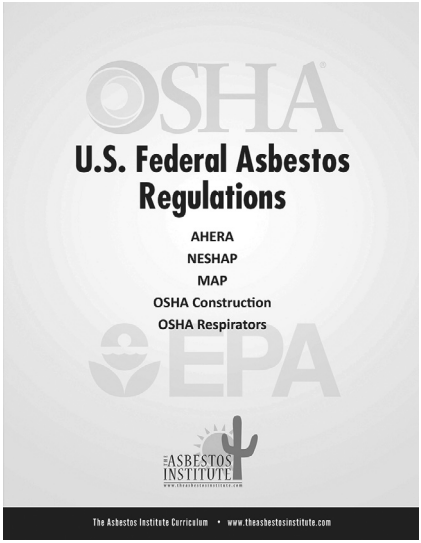

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