ASBESTOS AWARENESS

Objectives

- Be familiar with background information and Health Effects.
- Have a General Understanding of Sampling Protocols and Interpretation of Lab Results.
- Be familiar with Regulatory Terms and Definitions.

Objectives(continued)

- Be Familiar with Regulatory Requirements When Dealing with Asbestos Containing Material (ACM).
- Be familiar with Means and Methods to Reduce Exposure.
- Meet Regulatory Training Requirements.
- Have an Opportunity to have Questions and Concerns Addressed.

What is Asbestos?

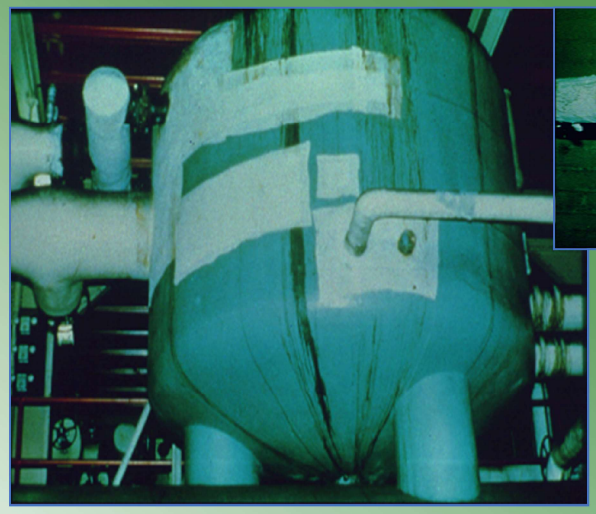
- **Asbestos** is a Naturally Occurring Mineral That is Extracted From The Earth By Mining. Found mainly in Canada, South Africa, and Russia.
- Asbestos Was Known and Used By The Greeks And Romans. The Word Asbestos Is Derived from A Greek Adjective Meaning Inextinguishable.

Unique Properties Of Asbestos

- It’s Plentiful & Readily Available
- Low In Cost
- Fire Resistant
- High Tensile Strength
- Poor Heat and Electrical Conductivity
- Generally Impervious To Chemical Attacks

Uses Of Asbestos

- Asbestos Has Been Used In Literally Thousands of Products. These Are Referred To As Asbestos Containing Materials (ACM). Some Of It's Uses Are As:
- Thermal Insulation Such As:
  - Boilers, Pipes, & Other High Temp Applications



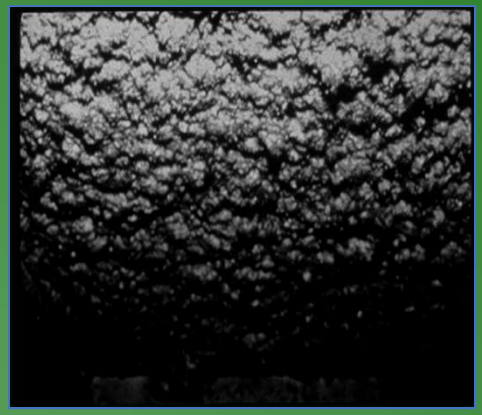
Use Of Asbestos Well Suited To The Construction Industry

- Fire Proofing Material
- Building Material To Enhance Strength
  - Portland Cement
  - Siding
  - Roofing Materials
  - Wallboard
  - Asphalt
  - Vinyl
- Roofing Felts
- Exterior Siding
- Floor Tile
- Joint Compounds
- Adhesives
- Acoustical Plaster
- Acoustical Tiles
- Many Other Materials

Environmental Protection Agency (EPA)

- EPA Distinguishes Between Friable & Non Friable Forms Of ACM.
- Friable ACM Contains More than 1% Asbestos Which Can Be Crumbled, Pulverized, Or Reduced To Powder By Hand Pressure When Dry.

- Friable Asbestos Is A Hazard When Disturbed!!!



Effects Of Asbestos On Human Health

- Inhalation of Asbestos Fibers Can Cause Serious Health Effects.
  - Asbestosis
  - Lung Cancer
  - Mesothelioma
  - Plueral Plaques
  - Plueral Effusion
  - Plueral Thickening

- Most Asbestos Related Diseases Have a Long Latency Period. (Time From Exposure To Time Diseases Show Up). Typically, 10-40 Years

Effects Of Asbestos On Human Health - Asbestosis

- **Asbestosis-** Is A Disease Characterized By Fibrotic Scarring Of The Lung.
  - Most Common Symptom Is Shortness Of Breath.
  - Prevalent Among Workers Who Have Been Exposed To High Doses of Asbestos Over A Long Period Of Time.

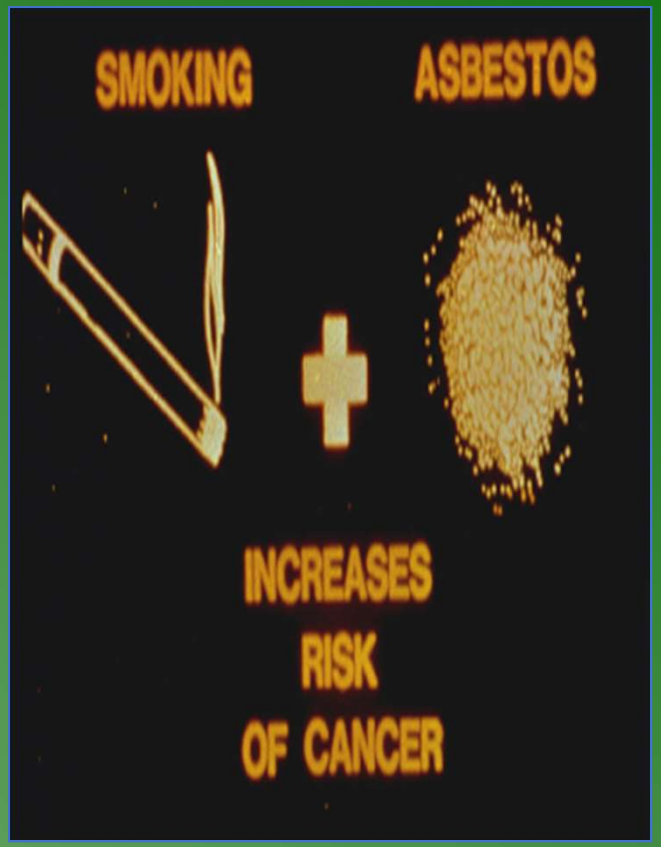
Effects of Asbestos On Human Health - Lung Cancer

- There Are Many Causes Of **Lung Cancer**. Asbestos Is One.

- Employees Exposed To Industrial Concentrations of Asbestos Are Five Times More Likely To Contract Lung Cancer Than The General Population.

Effects Of Asbestos On Human Health - Lung Cancer

- Cigarette Smoker Who Smokes a Pack a Day has a 10x Greater Chance of Getting Lung Cancer.
- IF You Smoke & Work With Asbestos You Are 50-90 x More Likely To Contract Lung Cancer Than The Normal Non Population.
- This is Known As a “Synergistic Effect”



Effects of Asbestos On Human Health - Mesothelioma

Mesothelioma- Is The Rarest But Most Deadly Disease Associated With Exposure To Asbestos.

- This Cancer Spreads Rapidly And Is Always Fatal.

EPA Identifies Three Major Categories of ACBM In Buildings

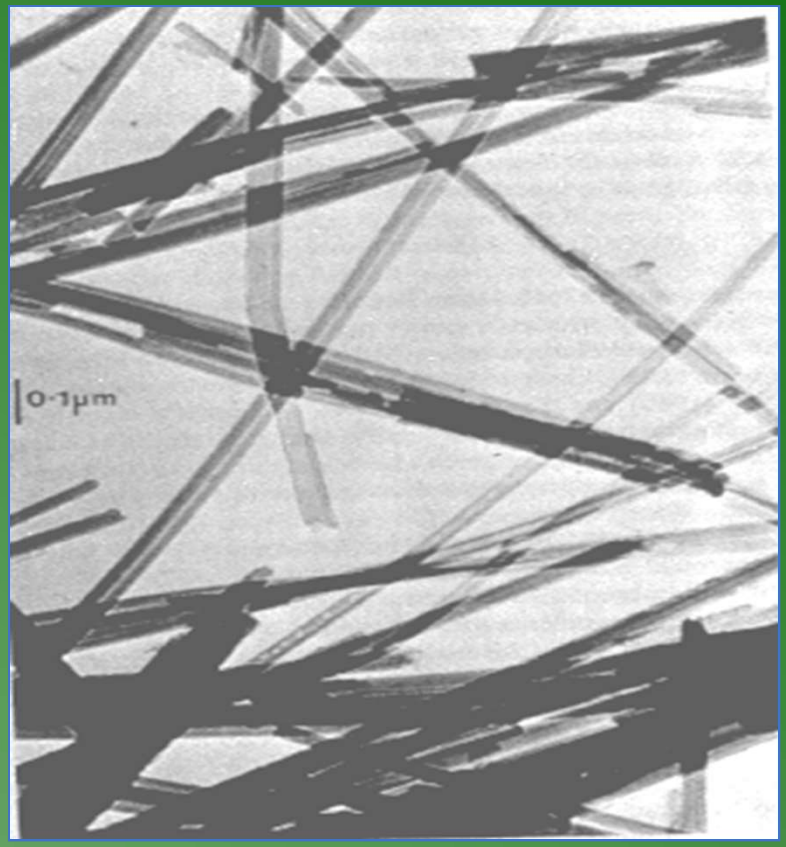
- **Surfacing Materials-ACM Sprayed Or Troweled On Surfaces Such As Walls, Ceilings & Structural Members**
- **Thermal System Insulation To Inhibit Heat Transfer Or Prevent Condensation On Pipes, Boilers, Tanks, Ducts, HVAC Systems.**
- **Miscellaneous Materials Such As Floor & Ceiling Tile**

Identification of Asbestos

- Materials Can Not Be Determined To Be Asbestos Containing Unless Analyzed By An Approved Laboratory.
- Bulk Samples Must Be Collected Only By A Licensed Asbestos Inspector.
- Samples Will Be Sent To An Approved Lab (NVLAP/AIHA) Using Chain of Custody.

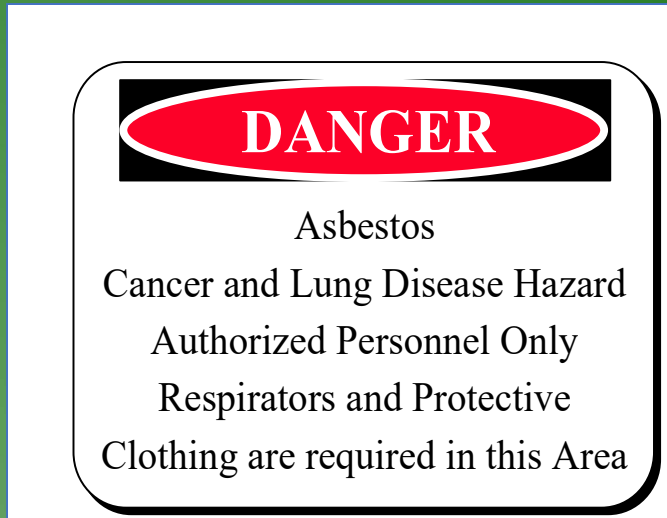
Identification of Asbestos(cont)

- Lab Will Use Stereoscope To Estimate Fibrous Content At Approximately 40x Magnification.
- Lab Will Then Place Fibers On A Slide With Refractory Oils and Analyze Utilizing a Polarized Light Microscope (NIOSH 9002) To Determine Type of Asbestos.



Identification of Asbestos(cont)

- Lab Will Then Report Results To Client. The Lab Report Will Tell The Inspector Two Things:
  - Type & Percentage of Asbestos
  - Must Be >1% to be ACM



Identification of Asbestos(cont)

- Material Must Be Greater Than 1% To Be Considered ACM.
- Lab Results Will Generally Give You A Range In Regards To The Content, i.e., 2-5%, 5-10%, or 20-30% As Examples.
- Additional Analysis May Be Required Using Point Counting or Transmission Electron Microscopy (TEM)

Identification of Asbestos(cont)

- Types of Asbestos
  - Chrysotile (White)-Most Common
  - Amosite (Brown)- Difficult to Wet
  - Crocidolite (Blue) – Occasionally Identified
  - Other Asbestiform Minerals
    - Actinolite
    - Tremolite
    - Anthropholite

Regulatory Terms-Definitions

- ACM- Asbestos Containing Material- Contains greater than 1% Asbestos
- ACBM- Asbestos Containing Building Materials.
- PACM- Presumed Asbestos Containing Materials (OSHA Term) – Suspect ACBM Installed Prior To 1980 Shall Be Assumed To Be Asbestos Containing.

Regulatory Terms-Definitions

- OSHA Classes of Work
- Class I – TSI or Surfacing
- Class II – Miscellaneous Materials
- Class III – Operations and Maintenance
- Class IV – Janitorial/Custodial Activities

Regulatory Terms-Definitions

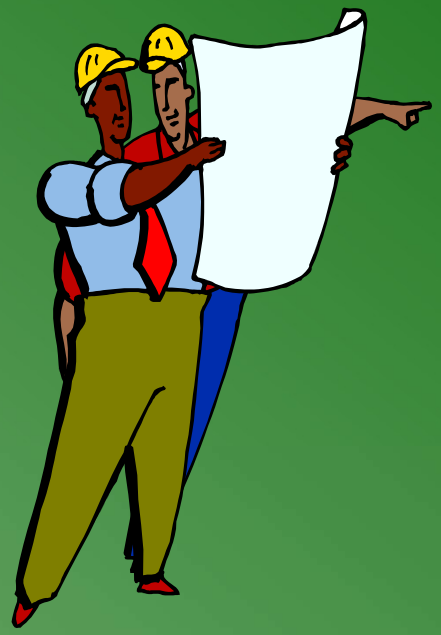
- RACM- Regulated Asbestos Containing Materials
  - Includes All Friable Materials
  - Includes Some Non Friable Materials
    - Category I NF That Has Become Friable
    - Category II NF That Is Expected To Become Friable When Exposed To The Forces Associated With Renovation and Demolition.

RACM Requirements

- Response Actions With RACM Must Be Performed By Licensed Contractor with Licensed Workers/Supervisors
- All Response Actions, Besides Small Scale, Short Duration Activities, Will Require Minimum 10 Day Notification To EPA Or State/Local Agency Serving as EPA Representative.

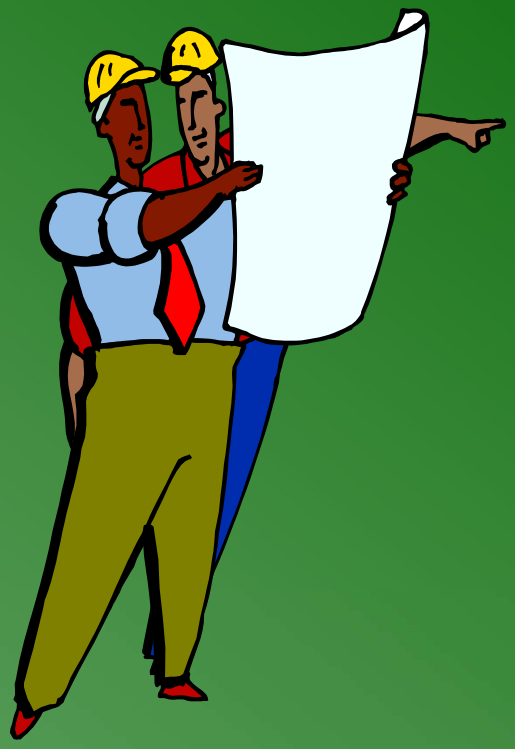
Abatement Or Repair Of Asbestos Containing Material

- Asbestos Containing Material May Be:
  - Removed
  - Repaired
  - Encapsulated
  - Enclosed
  - Maintained



Typical Abatement Job

- Project Designed by Licensed Project Designer
- Abatement Contractors Bid Job off Specs.
- Selected Contractor makes Notifications to Regulatory Agencies and Conducts Abatement Job with Licensed Workers & Supervisors.

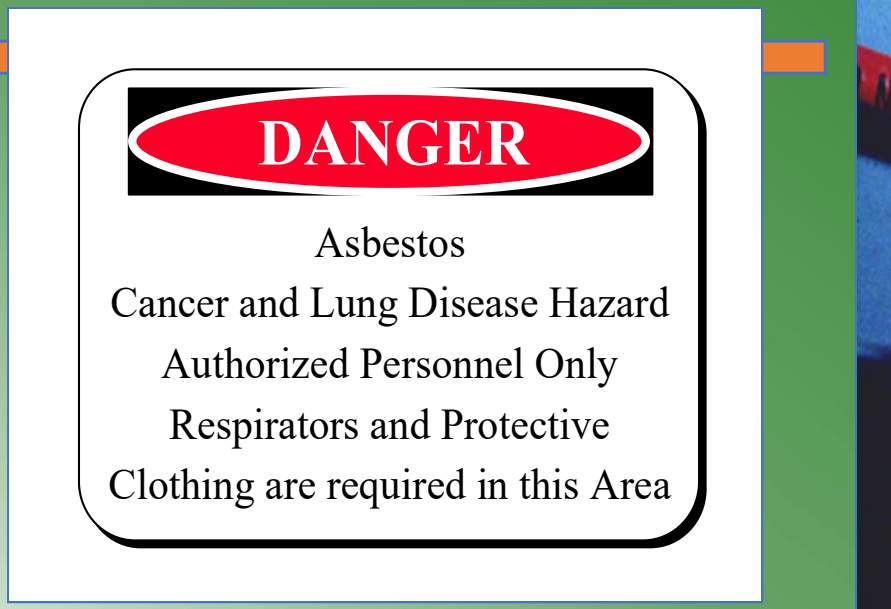


Abatement Of ACM- Step 1

- Conduct Background Air Sampling to Determine PPE Requirements.

Abatement Of ACM-Step 2

- Establish Regulated Area – Post Signage



Abatement Of ACM- Step 3

- Isolate HVAC & Electrical System

Abatement Of ACM-Step #4

- Preclean all items with wet wiping techniques and HEPA Vacuum. Remove items from the work area-cover stationary items with 2 layers 6 mil Plastic.



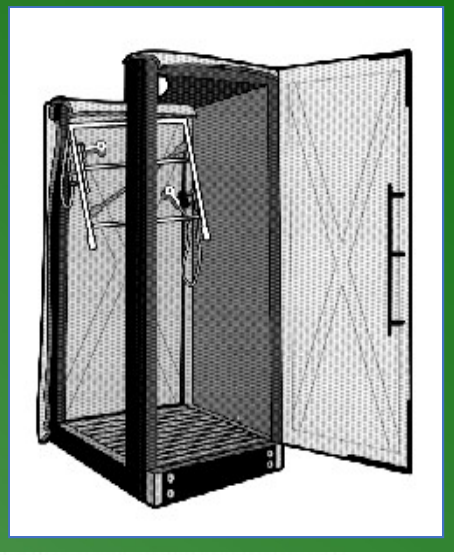

ExperiDo

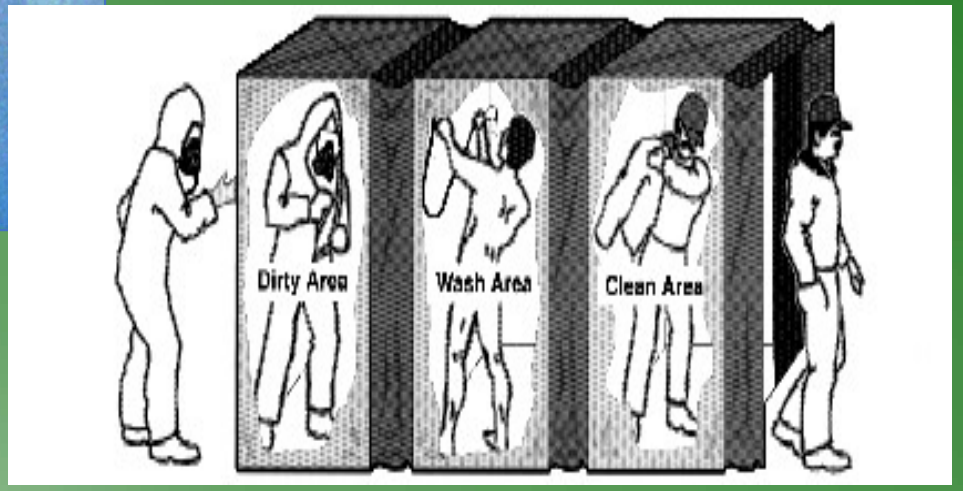
Abatement Of ACM-Step #5

- Construct Plastic Containment – 2 layers 6 mil on the floors & 2 layers 4 mil on the walls.

Abatement Of ACM-Step #6

- Build Decontamination Unit





Abatement Of ACM- Step #7

- Establish Negative Air Pressure

Abatement Of ACM-Step #8

- Adequately Wet Material and Remove with “NO VISIBLE EMISSIONS”

Abatement Of ACM-Step 9

- After Removal, Double Bag debris in (2) 6 mil plastic bags, & Conduct Clean-up.

Abatement Of ACM-Step 10

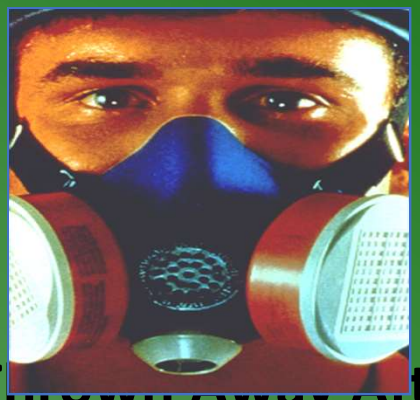
- Third Party conducts intense visual inspection, lock down is applied, & aggressive air sampling is conducted.

Abatement Of ACM-Step 11

- Final Air Samples Pass- Abatement Job is Complete
- Samples Fail- Re-Clean, & Sample Again
- Demobilize

Worker Protection

- **<u>Anyone</u> Working With Asbestos <u>Must</u> Take Appropriate Protective Measures. Since the routes of entry of concern for Asbestos are Inhalation & Ingestion, PPE usually consists of:**
- **Respirators**
  - **Air Purifying Respirators**
  - **Supplied Air Respirators**
- **Clothing**
- **Typically Disposable Clothing And Is Thrown Away After Each Work Shift**



Control Of Asbestos

- If Not Damaged Asbestos Need Not Pose A Hazard To People
- If Not Significantly Damaged Asbestos Can Be Repaired And Again Not Pose A Hazard To People
- If Significantly Damaged Asbestos Can Be Removed Thereby Eliminating It's Hazard

Control Of Asbestos-Housekeeping Requirements

- Never use compressed air to clean surfaces around ACM.
- Never shovel or dry sweep suspect ACM. Always use wet methods or HEPA Vacuums.
- Never sand or scrape asphalt or vinyl flooring which is ACM or PACM.
- Strip finishes with wet methods, low abrasion pads, & at speeds less than 300 rpm.

Laws

- **OSHA**
  - *29 CFR 1926.1101 (Construction Industry)*
  - *29 CFR 1910.1001 (General Industry)*
  - *29 CFR 1910.134 (Respiratory Protection)*
    - *PEL- .1 Fibers/Cubic Centimeter*
    - *EL- 1.0 Fibers/ Cubic Centimeter /30 Minutes*

Laws

- **USEPA**
  - *AHERA (Schools K-12 Buildings)*
  - *ASHARA (Public & Commercial Buildings)*
  - *NESHAP (Renovation & Demolition)*
  - *Worker Protection Rule*
    - *EPA Clearance Level- .01 Fibers/Cubic Centimeter*

Summary

- Asbestos is Pervasive Throughout Our Environment. Until Recent Years They Have Been Used Extensively In All Types & Manner Of Products and Construction.
- We Can Coexist Safely With Both By Using Proper Safeguards, Precautions & Approved Control And Abatement Methods