



## ASBESTOS CONTAINING MATERIALS (ACM) REVIEW – 20080908

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### 1. Introduction

2. Asbestos = Ancient Greece "Greek adjective meaning inextinguishable"
3. Roman "Miracle Mineral"

### 4. CHARACTERISTICS:

5. Mineral: Natural Occurring
6. Types:
  7. Chrysotile – white
  8. Amosite – brown
  9. Crocidolite - blue

### 10. Aerodynamics:

11. Fiber: A particle that is 5µm or longer, with a length to diameter ratio of 3 to 1 or longer.

### 12. PHYSICAL ATTRIBUTES:

13. Good thermal insulator
14. High Tensile Strength
15. Resistant to Chemicals
16. Plentiful and Inexpensive

### 17. CATEGORIES OF ACM:

18. Surfacing – Sprayed on or trowel applied
19. Thermal System Insulation – Inhibit heat transfer or prevent condensation
20. Miscellaneous – all other forms

### 21. DEFINITIONS:

22. Asbestos-Containing Material (ACM) – a material or product which contains greater than 1% asbestos
23. Friable – describes a material which, when dry, can be crumbled, pulverized, or reduced to powder with hand pressure (EPA)
24. Intact – describes a material which has not been crumbled, pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound within its matrix (OSHA)

### 25. IDENTIFICATION OF ACM:

26. Bulk Samples
27. Microscopy using PLM (sometimes TEM)

### 28. HEALTH EFFECTS

29. PRIMARY ENTRY: INHALATION
30. SECONDARY ENTRY: INGESTION
31. RISK FACTORS

32. DURATION OF EXPOSURE - EXPOSURE IS CUMULATIVE
33. INTENSITY - AMOUNT OF DUST INHALED
34. AGE AT FIRST EXPOSURE
35. SMOKING TOBACCO PRODUCTS
36. TYPE OF ASBESTOS INHALED
37. NATURAL DEFENSE MECHANISMS OF THE HUMAN BODY:
  38. Nose Hairs – a crude air filter
  39. Cilia - "Muco-ciliary Escalator"
  40. Macrophage – giant white blood cells
41. ASBESTOS RELATED DISEASES
  42. Asbestosis – cumulative fibrotic scarring, dose related (not a cancer)
  43. DIFFUSE INTERSTITIAL FIBROSIS
  44. PNEUMOCONIOSIS
  45. CAUSED BY AN ACCUMULATION OF FIBERS IN LUNG
  46. WHITE BLOOD CELL DEFENSE MECHANISM DOESN'T WORK
  47. Lung Cancer – most common, dose related
  48. GREATEST RISK FOR ASBESTOS WORKERS - > 1/2 OF DEATHS
  49. ACTS SYNERGISTICALLY WITH CIGARETTE SMOKING
  50. MUCOCILIARY ESCALATOR DEFENSE MECHANISM DOESN'T WORK)
  51. LATENCY PERIOD > 20 YEARS & PEAKED BETWEEN 30-35 YEARS
  52. STRONG CUMULATIVE DOSE-RESPONSE RELATIONSHIP
  53. Mesothelioma – cancer of the lung lining or abdominal lining, not dose related
  54. ACCOUNTS FOR 10-18% OF DEATHS
  55. BOTH PLEURAL AND PERITONEAL MESOTHELIUM
  56. EXTREMELY RARE IN UNEXPOSED POPULATION
  57. LATENCY PERIOD OF 25-30 YEARS
  58. SOMETIMES > 40 YEARS
  59. RARELY CURABLE & USUALLY FATAL WITHIN 1 YEAR OF DIAGNOSIS
  60. GASTROINTESTINAL CANCERS
  61. Dose/Response Relationship
  62. Mesothelioma does not conform to this logical progression
  63. SYNERGISTIC EFFECT:
    64. Those who smoke and work with asbestos unprotected are at much greater risk of contracting lung related diseases (80 TIMES GREATER RISK).
  65. MEDICAL SURVEILLANCE:
    66. Trigger Mechanisms: Exposure at or above the PEL for more than 30 days per year

67. Performing Class I, II, or III work for 30 or more days per year
68. A combination of 1 and 2 above
69. Wearing a Negative Pressure Respirator
70. MEDICAL SURVEILLANCE:
  71. Required Annually
  72. Components
    73. Medical questionnaire (work and medical history)
    74. Pulmonary Function Test (PFT)
    75. Chest X-Ray (if required by Physician)
    76. Examination by licensed health care professional
  77. INFORMATION TO PHYSICIAN
  78. COPY OF STANDARD AND APPENDICES
  79. DESCRIPTION OF DUTIES
  80. REPRESENTATIVE EXPOSURE LEVELS
  81. DESCRIPTION OF PPE USED
82. INFORMATION FROM PHYSICIAN
83. WRITTEN OPINION INCLUDING RESULTS OF MEDICAL EXAMINATION
84. MEDICAL CONDITIONS WHICH WOULD PLACE EMPLOYEE AT INCREASED RISK FROM EXPOSURE
85. EMPLOYEE LIMITATIONS OR RESTRICTIONS ON USE OF PPE
86. EXAMINATION RESULTS AND MEDICAL CONDITIONS WHICH MAY RESULT FROM ASBESTOS EXPOSURE
87. INCREASED RISK OF LUNG CANCER FROM COMBINED EFFECT OF SMOKING AND ASBESTOS EXPOSURE
88. Personal Protective Equipment
  89. Respirators
    90. Written Respirator Protection Plan
    91. Medical Surveillance Plan
  92. Coveralls, Gloves, Shoes, Hard-hats, etc.
93. Regulations
  94. Asbestos Hazard Emergency Response Act (AHERA) - 1986
    95. Applies to all Schools K - 12
    96. Requires Asbestos Inspection/Management Plan
    97. Requires Annual Notification to Parents
    98. Requires Periodic Surveillance Every 6 Months
    99. Requires Re-inspection or ACM Every 3 Years by an Accredited Inspector
  100. Established Model Accreditation Plan (MAP)
  101. Worker, Supervisor, Inspector, Management Planner, Project Designer
102. National Emission Standard for Hazardous Air Pollutants (NESHAP) – Revised 1990
  103. Requires Asbestos Inspection Prior to Renovation/Demolition of a Public or Commercial Facility
  104. Originally Established Four Basic Requirements for Large Abatement Projects (More than 260 ft. or 160 sq. ft. or 35 cu. ft.)
    105. Notification
    106. Wet Methods

107. No Visible Emissions
108. Proper Waste Disposal
109. Asbestos School Hazard Abatement Reauthorization Act (ASHARA) - 1992
110. Set Aside Federal Funds for School Abatement Activities
111. Placed MAP Requirements on Asbestos Activities Taking Place in Public and Commercial Facilities
112. Excluded Management Planner
113. Worker Protection - OSHA 1926.1101
114. Four Classes of Asbestos Work
115. Exposure Assessment and Monitoring
116. Methods of Compliance
117. Personal Protective Equipment
118. Communication of Hazards
119. Medical Surveillance
120. Recordkeeping
121. S.C. DHEC 61-86.1 (Revised May 22, 1998)
122. Training
123. Licensing
124. Notifications
125. Work Practice Site Audits

#### **ASBESTOS LIMITS**

Asbestos	0.01 fibers/cm <sup>3</sup> OSHA Clearance
	0.1 fibers/cm <sup>3</sup> OSHA PEL
	1.0 fibers/cm <sup>3</sup> OSHA 30 Min. Excursion
ACM	> 1.0% Asbestos

#### **EPA WORKER LIMITATIONS**

AHERA Four Day Worker

- >260 ln.', 160 sq.', or 35 cu.'
- Supervisor required

AHERA Two Day O&M Worker

- 3 sq. or lin. feet or less of friable ACM

#### **SCDHEC PROJECT DEFINITIONS**

NESHAP Project

- >260 ln.', 160 sq.', or 35 cu.'
- Supervisor required

Small Project

- < 260 ln.', 160 sq.', or 35 cu.'
- > 25 ln.', 25 sq. ' or 10 cu. '

Minor Project

- < 25 ln.', 25 sq.' or 10 cu.'

#### **OSHA PROJECT DEFINITIONS**

Class I (32 hr.) – TSI & Surfacing

- > 25 ln.' or 10 sq. ' - Decon required
- < 25 ln.' or 10 sq.'
- Change area required w/ no NEA
- Competent Person required (40 hr.)

Class II (8 hr.)

- Unlimited, no quantity designated
- ACM which is not TSI & Surfacing
- Competent Person required (40 hr.)

Class III (16 hr.) Repair & Maintenance

- ACM & TSI & Surfacing "likely to be disturbed"
- No greater than a 60"x60" waste/glove bag
- Competent Person required (16 hr.)

Class IV (2 hr.) Awareness, Maintenance and Custodial

- May contact, but not disturb
- Competent Person required (16 hr.)