Asbestos Operations & Maintenance Training Course

Notice to Viewer:
This sample slideshow includes our standard, up to date information that is based on industry standards and current EPA and OSHA requirements. We can customize this material to meet state and local requirements in your area. Feel free to contact us for a quote. This sample manual is presented for viewing only and may not be reproduced.

TSI

www.TSItraining.com

Call 1-866-666-8438 Fax 1-866-813 -9804

Asbestos Operations & Maintenance Training Course

TSI
www.TSItraining.com
Call 1-866-666-8438 Fax 1-866-813 -9804

Section 1
Background & Health Effects

TSI
www.TSItraining.com
Call 1-866-666-8438 Fax 1-866-813 -9804

SOME FACTS ABOUT ASBESTOS

- Used in over 3000 commercial products
- Extremely long, thin flexible fibers that can be woven
- High tensile strength
- Resistance to chemical and thermal degradation
- High electrical resistance
- Fire resistant
- Good insulator

TSI P.4

Asbestos minerals


Chrysotile


Amosite


Crocidolite


Actinolite


Tremolite


Anthophylite

TSI P.4

Asbestos in the U.S.

- Identified in 20 states, mined in 17
- Found in mountainous areas of country
- Most deposits contain <6% asbestos
- Few deposits >50% asbestos


USEPA photo of serpentine rock

TSI P.5

Asbestos in US

- 324 locations - Eastern US
- 36 locations - Central US
- 48 locations in the Rocky Mountain States (Colorado, Idaho, Montana, New Mexico and Wyoming)
- More expected in remaining Western US, still investigating

TSI P.5

Worldwide Asbestos

- World production of asbestos was estimated to be 2. 2 Mt in 2007
- Russia is leading producer
- 95% of asbestos from Russia, China, Kazakhstan, Canada, Brazil, and Zimbabwe

TSI P.5

Uses of asbestos

- **USEPA Sample List of Suspect Asbestos - Containing Materials** P.6
- **Commercial & School Buildings** P.7

- **Residential Buildings** P.7

TSI P.6-7

Asbestos Bans

NESHAP Bans

- Spray-applied fireproofing - 1973
- Preformed block pipe, boiler, tank, duct insulation - 1975
- Spray-applied decorative uses - 1978
- Other decorative uses - 1990

TSI P.8

Asbestos Bans

EPA Ban and Phase Out Rule *1989-91*

- Corrugated paper
- Roll board
- Commercial paper
- Specialty paper
- Flooring felt
- New uses of asbestos

TSI P.8

Asbestos Bans

Examples of Products Not Banned

- Asbestos cement (transite)
- Asphalt roofing products
- Ceiling Tile
- Resilient flooring (tile & sheeting)
- Mastics
- Millboard
- Wallboard & joint compound
- Friction products
  - disc brakes & brake drums
  - transmission parts & clutch facings
- Clothing & cloth products
- Caulking & glazings
- Light concrete
- All other uses not mentioned in bans

TSI P.8

Enforcing the Bans

EPA does not track asbestos products

- manufacture,
- processing or
- distribution in commerce

TSI P.8

Asbestos Content Information:

- Material Safety Data Sheets.
- Construction specifications
- Written verification in new construction or renovation (cut sheets).
- **Laboratory testing**.

TSI P.8

Active U.S. Ban Legislation

Senate passed Ban Asbestos in America Act

- Bans nearly all asbestos uses
- Exempts naturally occurring fill material
- Other exemptions include DOD, NASA, & chlorine process

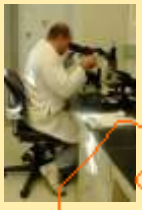
Similar bill in House committee

TSI P.8

Asbestos Containing Materials

USEPA & OSHA

- More than 1% asbestos



TSI P.9

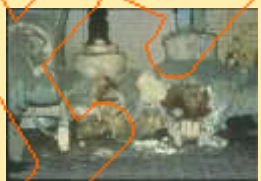
Friable vs. Non-Friable

Can the material be crumbled, pulverized, or reduced to powder by hand pressure?

TSI P.9

Intact vs. Non-Intact

Crumbled, pulverized, or otherwise deteriorated so that the asbestos is no longer bound in the material's matrix (OSHA)



TSI P.9

Categories of ACM

- Surfacing ACM

- Thermal System Insulation ACM (TSI)

- Miscellaneous ACM

TSI P.9

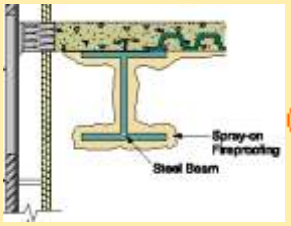
Categories of ACM

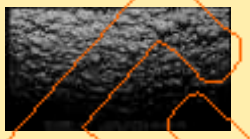
- Surfacing – "…material that is sprayed-on, troweled-on, or otherwise applied to surfaces such as acoustical plaster on ceilings and fireproofing on structural members…"

TSI P.9

Categories of ACM

- Surfacing





TSI P.9

Categories of ACM

- TSI – "…material applied to pipes, fittings, boilers, breeching, tanks, ducts, or other components to prevent heat loss or gain, or water condensation, …"

TSI P.9

Categories of ACM

TSI

Pipe Insulation & Fittings

TSI P.9

Categories of ACM

Valve Insulation

TSI

Duct Insulation

TSI P.9

Categories of ACM

TSI

TSI P.9

Categories of ACM

TSI

TSI P.9

Categories of ACM

- Miscellaneous – "...material on structural components, structural members or fixtures, such as floor tile or ceiling tile, and does not include surfacing or TSI."

TSI P.9

Categories of ACM

Miscellaneous

Roofing

Siding

TSI P.9

Categories of ACM

Miscellaneous

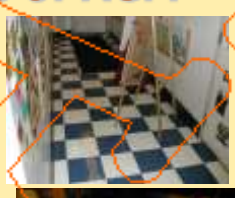
Fire Doors

TSI P.9

Categories of ACM

Miscellaneous

Flooring



TSI P.9

Categories of ACM

Miscellaneous

Drywall & Joint Compound

TSI P.9

Categories of ACM

Ceiling Tile

Miscellaneous

TSI P.9

Categories of ACM

Hard Plaster

Miscellaneous

TSI P.9

Categories of ACM

Miscellaneous

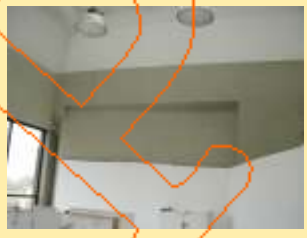
Electrical Cable Insulation

Electrical Components

Vermiculite

TSI P.9

Categories of ACM



Miscellaneous

Light Fixture Paper

TSI P.9

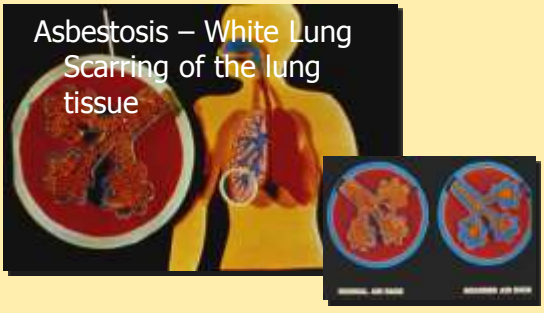
Health Effects of Asbestos

- Primary route of exposure is inhalation
- Secondary route is ingestion
- Latency Period of 10-40 years
- 10,000 deaths/ year
  - Mining
  - Milling
  - Manufacturing
  - Insulating
  - Ship building
  - Construction

Worker handling amosite asbestos at a pipe insulation manufacturing plant in Tyler, TX in the early 1970's. CDC Photo

TSI P.10

Asbestos Diseases

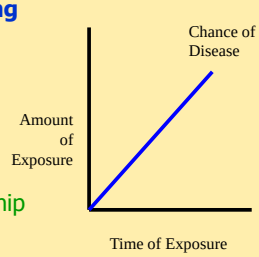


TSI P.10

Asbestos Diseases

Asbestosis – White Lung

- 1,500 deaths/ year
- 20,000 hospital visits
- 10-20 yr latency period
- Shortness of breath common symptom
- Dose-response relationship



TSI P.10

Asbestos Diseases

Lung Cancer

- 4,000 deaths/ year
- Dose-response relationship
- 20 yr latency period


Healthy Lung


Lung Cancer

TSI P.10

Asbestos Diseases

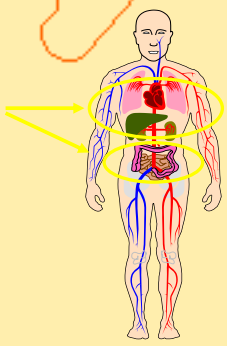
Lung Cancer

- Increased risk from smoking 10x
- Increased risk from industrial asbestos exposure 5x
- Combined increased risk over 50x

TSI P.10

Asbestos Diseases

- **Mesothelioma**
  - Cancer of the lining of the chest cavity or abdomen.
  - 2,500 deaths/ year
  - Rare Cancer
  - No dose-response relationship
  - Always fatal
  - 20-40 yr latency



TSI P.11

Other Diseases

- Pleural plaques
- Pleural thickening
- Pleural effusion

Cancers

- Esophagus
- Stomach
- Colon
- Pancreas

TSI P.11

Asbestos Diseases

- Risks Associated with Low Level Asbestos Exposure

- Manufactured Mineral Fibers

TSI P.11

Current Events

World Trade Center/ Lower Manhattan Test and Clean Program

- Test for remaining dust
- 2002 program cleaned/ tested 4100 homes
- Coordinating proper demolitions

TSI P.12

Libby, Montana

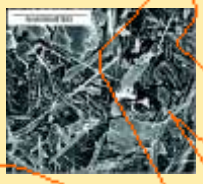
- One of largest asbestos exposure cases in US
- Over 7000 individuals tested 2000-01
- 18% have asbestos-related abnormalities
- Typical products
  - concrete aggregate
  - fertilizer carriers
  - potting soil
  - soil conditioners
  - Attic & wall insulation

TSI P.12

Libby, Montana

Mine Facts:

- Opened in 1921
- 80% world's supply of vermiculite
- W.R. Grace purchased in 1963
- Stopped production in 1990
- Stopped shipments in 1992
- Average amphibole asbestos content of 4 to 6%



TSI P.12

Libby, Montana

- Most of clean-up is completed
- Abatement of 794 properties by end of 2006
- Removed 400,000 tons contaminated soil
- Screened over 3500 properties in Libby area
- Screen 1000 properties in Troy, MT area
- EPA costs over $150,000,000

TSI P.12

Son's of Libby Assessment

TSI P.13

Son's of Libby Assessment

- 243 sites received Libby vermiculite
- ATSDR investigating 28
- Testing & remediation occurring

TSI P.13

Vermiculite Insulation Awareness Campaign

- Do not disturb
- Limit activity level in attic
- Keep children out
- Do not remove it yourself
- Hire asbestos professionals to safely remove the material

TSI P.13

Naturally Occurring Asbestos (NOA) in California

Eldorado Hills community

- EPA assessed sports venues, playgrounds, and gardens at schools, parks, and playgrounds
- Testing shows that asbestos fibers were found in almost all the samples collected

TSI P.13

Naturally Occurring Asbestos (NOA) in California

- Clear Creek Management Area (CCMA) is located on one of the largest naturally occurring asbestos deposits in the world
- 30,000-acre serpentine deposit is used by thousands of visitors each year

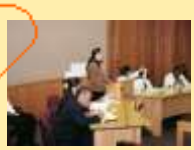
TSI P.13

Section 2
Legal Issues

TSI
www.TSItraining.com
Call 1-866-666-8438 Fax 1-866-813 -9804

Areas of Liability

1. Regulatory
2. Criminal
3. Civil
   - Contractual
   - Tort



TSI P.14

Civil Liability

- Study by RAND Institute for Civil Justice issued May 10, 2005
  - Over 730,000 people in the US have filed claims
  - Claims cost businesses over $70 billion by end of 2002
  - Claimants receive about $0.42/ $1.00 spent on litigation
  - Defense costs are about $0.31/ $1.00

TSI P.14

Civil Liability

- Study by RAND Institute for Civil Justice issued May 10, 2005
  - Plaintiff attorneys and other related costs are about $0.27/ $1.00
  - 90% of all new claims by people with no cancerous injuries
  - Mesothelioma cases doubled 1994-2002, still small percentage
  - Increasing claims brought by non-asbestos trades

TSI P.14

Federal Asbestos Regulations

OSHA (29 CFR 1926.1101)

- All asbestos jobs covered
- **Class I** – Removal of TSI & surfacing
- **Class II** – Removal of all materials except TSI & surfacing
- **Class III** – any repairs up to 1 glovebag or disposal bag
- **Class IV** – cleanup where ACM is contacted but not disturbed
- **Unclassified operations**
- **PACM** - Presumed Asbestos-Containing Material.

TSI P. 15

Federal Asbestos Regulations

NESHAP (40 CFR Part 61 Subpart M)

- Category I NF (pliable)
- Category II NF (brittle, rigid)
- RACM – basically any currently or will become friable material
- Notification requirements
- Emission control procedures
- Disposal requirements

TSI P. 15

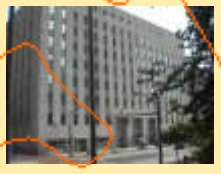
Federal Asbestos Regulations

AHERA (40 CFR Part 763 Subpart E)

- All LEA's - public or private, not-for –profit school system consisting of grades K-12.
- Manage/ abate all asbestos containing building material (**ACBM)**
- **Response actions** include all friable asbestos abatement projects conducted in school building or on exterior mechanical components

TSI P. 15

Building Owner Responsibilities



- Identify ACM
- Notify occupants

TSI P. 16

Employer Responsibilities

- Identify ACM
- Notifications
- Worker Protection
  - Training – asbestos & safety
  - Medical
  - Fit tests
  - Tools & equipment
  - Safety equipment

TSI P. 16

Competent Person's Responsibility

Responsible for activities at work site
1 Competent Person/ work site

Capabilities

- **Identifying hazards**
- **Selecting control strategy**
- **Authority to take corrective measures**
- **Keep trained**
- **Employee exposure determination**

TSI P.16

Competent Person's Responsibility

Responsibility areas:

- **Violations, injuries, damage**
- **May be personally responsible**
- **Regularly inspect job site**

TSI P.16

Worker's Responsibility

- Knowingly and willfully violating a regulation
- Falsifying training records
- Performing asbestos work without the proper training

TSI P.17

Training

OSHA Requirements

- Prior to start of work
- Annual refresher

Repair & Clean-up Training

- Asbestos repair- 16 Hr O&M
- Asbestos clean-up- at least 2 Hr awareness
- Competent person – 16 hours

TSI P. 17

Section 3
Sampling & Analysis

TSI
www.TSItraining.com
Call 1-866-666-84.18 Fax 1-866-813 -9804

Bulk (Material) Sampling

- Determines % asbestos in material
- Multiple samples
- Sample w/ highest asbestos content = material asbestos content
- Personnel certification required
- O&M – no bulk sampling
- Various analytical methods
- Data in asbestos survey reports

TSI P. 18

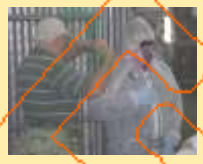
Bulk Sampling

- Any samples from material over 1% = ACM
- Materials with asbestos 1% or less have OSHA issues
- No testing data = ACM

TSI P. 18

Personal Air Sampling

- Exposure outside respirator
- Competent person's responsibility
- Use of previous data
  - Similar repairs
  - Good for 1 year



TSI P. 18

Personal Air Sampling

- Procedures
  - Position of sample
  - Pump position & flow rate
  - Calibration requirements
  - 30 minute & 8 hr TWA measurements

TSI P. 19

Personal Air Sampling

Recordkeeping Requirements

- Date of measurement
- Operation (task)
- Sampling & analytical methods
- Number, duration, & results of samples
- Protective devices worn
- Name, ID#, & exposure of all represented employees

TSI P. 19

Sampling Results & Exposure Levels

- Results available w/in 5 days for 30 years past sampling
- PEL's
  - 0.1 f/cc – 8 Hr TWA
  - 1.0 f/cc – 30 min excursion

TSI P. 19-20

Sampling Results & Exposure Levels

Negative Exposure Assessment

- Proof being below PEL
- Objective, previous jobs, current jobs
- Once NEA established
  - Similar jobs assumed below PEL
    - Closely resemble criteria
  - Can reduce requirements

TSI P. 20

Calibration

- Validates pump air flow
- Taken before & after each sample
  - Average measurements
- All calibrations should be traceable to a primary standard

TSI P. 20

Air Sampling Log

TSI P. 21

Section 4 Medical Surveillance

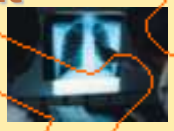
TSI
www.TSItraining.com
Call 1-866-666-8438 Fax 1-866-813-9804

Medical Surveillance Triggers

- **Respirator Approval**
  - Doctor's or physician's authorization required
  - Prior to wearing respirator
- **Medical surveillance program *required***
  - 30 Days of Class III work or exceeding PEL
  - W/in 10 days of 30th day

TSI P.22

Exam Content



- Respirator approval
  - Physician's signature
- Medical surveillance program

Exam Component	Initial	Annual
Medical questionnaire/history	Comprehensive	Abbreviated
Comprehensive medical evaluation determined by licensed physician	Yes	Yes
Pulmonary function tests	Yes	Yes
Chest X-rays interpreted by a B reader	Usually, up to physician	Usually every 2-5 years, up to physician

TSI P.22

Exam Results

- Reports signed by physician
- Surveillance exams conducted in accordance w/ 29 CFR 1926.1101
- Kept for 30 years past last date of employment
- Available upon request
- Example form p.23

TSI P.22

Section 5
Personal Protective Equipment

TSI
www.TSItraining.com
Call 1-866-666-8438 Fax 1-866-813 -9804

RESPIRATORY HAZARDS

Categories of Respiratory Hazards	
Oxygen Deficiency Toxic Contaminants	Asbestos ←
Types of Toxic Contaminants	
Particulates Gases Vapors	Asbestos ←

TSI P.24

RESPIRATORY HAZARDS

Controlling Respiratory Hazards	
Assess the hazard	Bulk Sampling Air Sampling
Reduce or eliminate the hazard	Work practices & engineering controls
Provide respiratory protective equipment	Proper respirators & filters

TSI P.24

Use of Respirators

When do I have to wear a respirator?

1. Repairing TSI or surfacing ACM
2. ACM not removed intact
3. Wet methods not used
4. Exposure above PEL/ no NEA exists

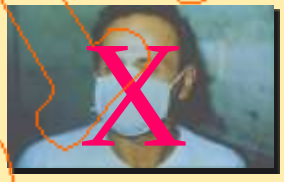
When do I ***not*** have to wear a respirator?

1. Miscellaneous ACM contacted
2. Wet methods used
3. NEA exists
4. ACM removed intact

TSI P.24

Types of Masks

- OSHA has Assigned Protection Factors for each respirator face piece
- Filtering facepiece (Dust mask) not for asbestos use



TSI P.24

Types of Masks

Half-Mask Air-Purifying

- PF=10

TSI P.25

Types of Masks

Full Facepiece Air-Purifying

- PF=10 (qualitative)
- PF=50 (quantitative)

TSI P.25

Types of Masks

Powered Air-Purifying

- PF=1000

TSI P.25

Maximum Use Concentration

- Highest exposure allowed w/ type of respirator
  PEL inside facepiece (0.1 f/cc)
- Allowed to wear any respirator @ or below MUC
- Recommended use concentration
  - 0.01 f/cc inside facepiece (USEPA Final Clearance Level)

TSI P.25

Maximum Use Concentration

MUC = Respirator's APF x 0.1 f/cc

Respirator	MUC (APF x PEL)	Recommended Use Concentration (APF x 0.01 f/cc)
Half-Mask Air Purifying	**1.0 f/cc** (10 x 0.1 f/cc)	**0.1 f/cc** (10 x 0.01 f/cc)
Full Facepiece Air-Purifying w/ *Qualitative* Fit Test	**1.0 f/cc** (10 x 0.1 f/cc)	**0.1 f/cc** (10 x 0.01 f/cc)
Full Facepiece Air-Purifying w/ *Quantitative* Fit Test	**5.0 f/cc** (50 x 0.1 f/cc)	**0.5 f/cc** (50 x 0.01 f/cc)
Powered Air-Purifying (PAPR) Full Facepiece	**100.0 f/cc** (1000 x 0.1 f/cc)	**10.0 f/cc** (1000 x 0.01 f/cc)

TSI P.26

Types of Filters

National
Institute of
Occupational
Safety and
Health

Conducts Approval Testing

TSI P.26

Types of Filters

- HEPA = 99.97% @ 0.3 µm
- Purple or magenta colors

TSI P.26

Types of Filters

NIOSH Oil Mists/ Solvents Resistance Rating	
N	Not resistant
R	Resistant up to 1 shift
P	Oil proof, resistant over 1 shift

TSI P.26

Types of Filters

NIOSH Efficiency Rating	
95	95% of particles
99	99% of particles
100	99.97% of particles @ 0.3 µm

TSI P.26

Types of Filters

Filters Approved for Asbestos	
N 100	Acceptable (evaluate airborne oil mists/ solvents)
R 100	Acceptable (evaluate airborne oil mists/ solvents)
P 100	*Recommended (no evaluation needed)*

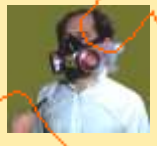
TSI P.26

User Seal Checks

- Every time
- Negative pressure check
  - Close off inlets
  - Inhale collapsing facepiece slightly
  - Seal should hold for 10 seconds
- Positive pressure check
  - Close off exhalation valve
  - Exhale gently 10 seconds w/o leakage

TSI P.27

Fit Tests



- Annually
- Exercises
- Qualitative
  - 4 solutions
  - Advantages/ disadvantages
- Quantitative
  - 3 methods
  - Fit factor values
- Acceptable methods

TSI P. 27-28

Respirator Care

- Cleaning
  - Warm soapy water wash
  - Clean water rinse
  - Air Dry
- Maintenance
  - Routine inspections
  - Repair w/ qualified personnel & parts
- Storage
  - Protect from damage
  - Plastic bag
- Acceptable methods

TSI P. 29

Protective Clothing

- Keeps asbestos off body
- Usually disposable
- Required above PEL or no NEA
- Wearing requirements
  - Don prior to entering regulated area
  - Remove on outside dropcloth/ outside regulated area

TSI P.30

Protective Clothing

Removal procedure:

- Proceed to decontamination area
- HEPA vac suit using buddy system
- Take suit off inside-out, rolling suit down body
- Dispose of suit as asbestos waste

TSI P.30

Proper respirator use?

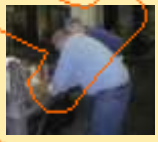
TSI

Section 6
Repair Asbestos Preparation

TSI
www.TSItraining.com
Call 1-866-666-8438 Fax 1-866-813 -9804

Overview

1. Determine asbestos content
2. Evaluate condition and amount of material
3. Determine if NEA exists
4. Determine effort level
5. Are people in adjacent areas aware?
6. Assemble needed tools and supplies.



TSI P.31

1. Asbestos Content

- Check for testing report
- Treating a material as non-ACM
  - Need testing data showing no ACM
- Treating a material as ACM
  - Testing data confirms ACM
  - No testing reports

TSI P.31

2. Material Amount & Condition

Quantities

- Class III work cannot exceed 1 glovebag or disposal bag

Condition

- Intact vs. non-intact
- Affects controls needed for repair

TSI P.31-32

3. NEA Exist ?

- Repairs conducted below PEL
- Conditions must 'closely resemble' previous repair
- Competent person's responsibility
- May reduce controls & PPE

TSI P. 32

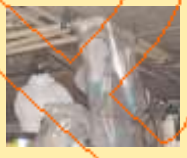
4. Level of Repair

- Level A Repair - Intact w/ NEA
  - Basic work practices
  - Established work area
  - Limited isolation of repair activity

TSI P.32

4. Level of Repair

- Level B Repair - Glovebag
  - 1 glovebag/ repair
  - Glovebag seals repair area, disturb material from outside bag
  - Commonly used for pipe insulation
  - Basic work practices
  - Established work area



TSI P.32

4. Level of Repair

Level C Repair – Mini-Enclosure

- Isolates repair area w/ 6 mil plastic enclosure
- Negative pressure & airflow established w/ HEPA filtration
  - Keeps fibers in area and air levels lower
- Used when glovebag can't contain disturbance
- Basic work practices
- Established work area
- Not sure what level – pick higher one

TSI P.33

5. Notifying Personnel

- Supervisor's/ designated person's responsibility
  - Repair personnel verify
- Options regarding adjacent personnel
  - Remove from surrounding area
  - Notify all in surrounding area
- Methods
  - Send notices
  - Post signs
  - Hold meetings

TSI P.33

6. Assembling Tools & Supplies

- Asbestos repair kit
- Keep stocked
- Contents

TSI

P. 33

Section 7
Setting Up the Work Area

TSI
www.TSItraining.com
Call 1-866-666-8438 Fax 1-866-813 -9804

Overview

- Prepare the area
- Establish regulated area
- Comply w/ regulated area requirements

TSI

P.34

Preparing the Work Area

- Follow general maintenance safety + asbestos controls
- LOTO electrical & HVAC (if feasible)
- GFCI live electric
- Cool lines
- Only authorized personnel in work area
  - Schedule when area is not in use
  - Lock room/ area
  - Barrier tape
- Avoid creating unsafe work area, ie egress

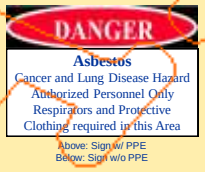
TSI

P.34

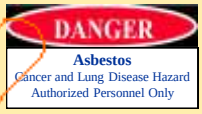
Establishing Asbestos Regulated Area

All asbestos repairs

1. Danger signs & barrier tape
   - Readable prior to entering regulated area
   - May be placed inside physical barriers
   - About 5-10' perimeter around repair location
2. GFCI live circuits
3. Remove non-stationary items
   - Move outside regulated area or cover w/ plastic



Above: Sign w/ PPE
Below: Sign w/o PPE

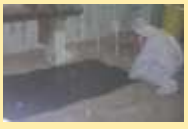


TSI

P.34-35

Establishing Asbestos Regulated Area

4. Plastic sheet/ drop cloth beneath removal activity
   - Extend 2-3' from repair area
   - Cover elevated working surfaces



5. Establish decontamination area
   - Required above PEL, optional below
   - Plastic sheet on floor outside regulated area
   - Used for donning/ removing PPE, cleaning waste bag & equipment

TSI

P.35

Regulated Area Requirements

Maintained during entire repair activity

1. Only authorized personnel inside
   - Readable prior to entering regulated area
   - May be placed inside physical barriers
   - About 5-10' perimeter around repair location
2. PPE donned prior to entry
   - Performed on outside drop cloth
3. Prohibited activities (w/ or w/o NEA)
   - Eating
   - Drinking
   - Smoking
   - Chewing tobacco or gum
   - Applying cosmetics

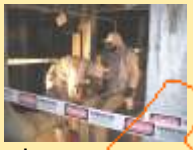
TSI P.35

Section 8
Asbestos Repair Work Practices

TSI
www.TSItraining.com
Call 1-866-666-8438 Fax 1-866-813 -9804

Overview

1. General asbestos work practices & prohibitions
2. Glovebagging
3. Mini-Enclosures
4. Waste disposal requirements
5. Specific procedures



TSI P.36

Asbestos Work Practices

- Wet methods, HEPA vacs, prompt clean-up
- Prevents uncontrolled fiber release
- Always used
- Exceptions may apply, i.e. safety issues

TSI P.36

Asbestos Work Practices

Wet methods

- Water + surfactant
- Other solutions may be considered
- Reduces airborne fiber concentrations
- Material dislodges from substrate easier
- Safety considerations/ solution properties

TSI P.36

Asbestos Work Practices

HEPA Vacuums

- 99.97% efficiency @0.3 µm
- Make sure working properly

Prompt Clean-up

- Containerize waste as soon as practical
- Prevents waste from drying/ releasing asbestos

TSI P.36-37

OSHA Prohibited Activities

- High Speed Saws
- Compressed Air
- Dry Clean-up

TSI P.37

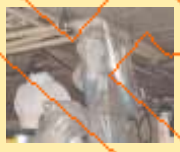
Glovebagging Procedures

Used for non-intact repairs or aggressive methods

Use right glovebag for the repair.

- Horizontal, vertical glovebags

1. Wrap the pipe insulation with 6-mil plastic sheeting & duct tape
2. Place necessary tools into pouch
3. Place or install water source
4. Secure and seal glovebag
   - Use duct tape, stapler optional
5. Secure HEPA vac nozzle



TSI P.37

Glovebagging Procedures

6. Attach HEPA vac, duct tape the nozzle
7. Insert arm(s) into glovebag sleeves.
8. Mist material
9. Cut and remove asbestos material from repair area.
   - Avoid puncturing glovebag.
10. Keep asbestos material wet.
11. Clean pipe/ substrate

TSI P.37-38

Glovebagging Procedures

12. Wash down inside of glovebag
13. Clean tools
14. Place tools in glovebag sleeve
    12. Twist arm, sealing from rest of glovebag.
    13. Tape the twisted arm, cut through the middle of the taped arm.
15. Evacuate air from glovebag using HEPA vacuum
    12. Twist the bag, sealing material in the bottom
16. Cut the glovebag above the sealed area.
17. Place in an asbestos waste disposal bag .

TSI P.38

Mini-Enclosures

Used when glovebags not suitable

1. Set up framework around repair
2. Seal enclosure w/ 6-mil poly
   - Walls, floors, ceiling
3. Set up decon (drop cloth) outside entrance
4. Install HEPA vacuum/ filtration
   - Establish air across breathing zone
5. Before disturbance, establish negative pressure & air flow.
6. Don respirator

TSI P.38-39

Mini-Enclosures

7. Put on disposable suit
8. Remove covers from material
9. Mist, cut, remove material. Collect in disposal bag
10. Wet/ remove remaining material
11. Scrub/ wipe down substrate
12. Clean/ wipe down enclosure interior. Encapsulant optional
13. Clean tools, dispose of rags

TSI P. 38

Mini-Enclosures

14. Collapse disposal bag, gooseneck
15. Remove equipment, materials, supplies. Reuse or dispose of enclosure plastic
16. Remove & dispose suits
17. Wipe off & remove respirator
18. Take sealed asbestos waste to secure area

TSI

P. 39

Summary Chart

- Intact repair w/ NEA
- Glovebagging
- Mini-Enclosure

TSI

P. 40

Waste Handling & Disposal

During repair collect continuously

Asbestos waste includes:

- Asbestos material
- Coveralls
- Used rags
- Used drop cloths
- Used respirator filters
- Unwanted asbestos barrier tape & signs

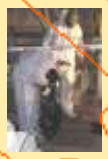
TSI

P.41

Waste Handling & Disposal

Procedures

- Use asbestos bags w/ OSHA & DOT labels
- Thoroughly wet waste and place in 1st bag
- Collapse 1st bag and seal by goose-necking with duct tape.
- 1st bag, drop cloths, suits, and used respirator filters are all placed in 2nd bag



Removing from facility

- Generator label
- Manifest

TSI

P.41

Material-Specific Requirements

- Piping System Insulation Repair
- Surfacing Material Repair
- Boiler and Tank Insulation Repair
- Drywall/ Joint Compound Repair
- Gasket Removal
- Repairs Involving Flooring Material
- Repairs Involving Transite Siding
- Repairs Involving Roofing Material
- Clean-up Procedures/ Fiber Release Episodes

TSI

P. 41-50

Section 9
Competent Person Responsibilities

TSI

www.TSItraining.com

Call 1-866-666-8438 Fax 1-866-813 -9804

Overview

Responsible for repairs

Capabilities

- Identifying hazards
- Selecting control strategy
- Authority to take corrective measures
- Keep trained
- Employee exposure determination

TSI P.51

Overview

Responsibility areas:

- Violations, injuries, damage
- May be personally responsible
- Regularly inspect job site

TSI P.51

Repair Activity Duties

- 1 Competent Person/ Repair
- Responsible for repair
  - Doesn't have to do it
- Needs to know expected exposure
  - Can rely on data from various sources w/in organization

TSI P.51

Repair Activity Duties

- Identify repairs asbestos repairs
- Determine repair level
- Review available NEA and determine employee exposure
- Make sure personnel qualified and have PPE & equipment
- Review work with personnel.
- Be available to respond
- Review paperwork, repair site, and waste disposal location

TSI P.51-52

Repair Activity Duties

- Oversee keeping equipment and supplies stocked.
- File completed paperwork in designated location.
- Make available air sampling reports with asbestos repair personnel.

Asbestos Repair Activity Log

TSI P.52-54

Section 10
Safety Concerns

TSI
www.TSItraining.com
Call 1-866-666-8438 Fax 1-866-813 -9804

Overview

- All job sites have safety concerns
- Asbestos abatement activities often make job sites less safe

TSI P.55

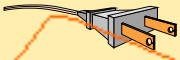
Electrical Safety

- Use proper lock-out/ tag-out procedures
- Use caution with wet methods
- De-energize as much equipment as possible
- Consider using dry removal in areas immediately adjacent to energized electrical equipment if de-energizing is not feasible.
- Use non-conductive tools
- Ensure that all electrical equipment in use is properly grounded, properly use GFCI's

TSI P.55

Electrical Safety

- Use care not to violate insulated coverings with scrapers, scaffolding wheels, etc
- Elevate wiring
- Do not allow water to accumulate on floors.
- Ensure that electrical outlets are tightly sealed and taped to avoid water spray.
- Perform a pre-work walkthrough to identify potential sources of electrical hazards.



TSI P.55

Electrical Injuries

- **Entrance Wound:** High resistance of skin transforms electrical energy into heat, which produces burns around the entrance point (dark spot in center of wound).

TSI

Electrical Injuries

- **Exit Wound:** Current flows through the body from the entrance point, until finally exiting where the body is closest to the ground.

TSI

Electrical Injuries

- **Arc or flashburn** - This man was near a power box when an electrical explosion occurred. Though he did not touch the box, electricity *arced* through the air and entered his body.

TSI

Electrical Injuries

- Current exited this man at his knees, catching his clothing on fire and burning his upper leg.

TSI

Electrical Injuries

- **Internal Injury**- This worker was shocked by a tool he was holding. The entrance wound and thermal burns from the overheated tool are apparent

TSI

Electrical Injuries

- **Internal injury** Same hand a few days later, when massive subcutaneous tissue damage had caused severe swelling (swelling usually peaks 24-72 hours after electrical shock).

TSI

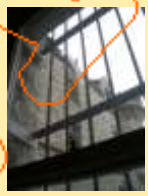
Electrical Injuries

- This worker fell and grabbed a powerline to catch himself. The resulting electric shock mummified his first two fingers, which had to be removed.

TSI

Ladders

- Extension type ladders - 1-4 lean ratio
- Maintain in good condition.
- Complete inspections are done periodically.
- No improvised repairs are made.
- Defective ladders are not used.
- Safety feet spreaders and other components of ladders are in good condition.



TSI

P.55

Ladders

- Movable parts operate freely without binding or undue play Rungs are kept free of grease or oil
- Ladders are used for their intended purpose
- Step ladders only used when fully opened.
- The user faces the ladder while going up and down.
- Tops are not used as steps.
- Back bracing not used for climbing.
- One person at a time.
- Fiberglass ladders are recommended.

TSI

P.55

Scaffolding

- Ensure proper setup, regular inspection, and basic maintenance
- For free-standing mobile scaffolding, height = 4x base
- When workers will be riding mobile scaffolding, height = 2x base
- Guardrails when scaffold is over 10'
  - Also when height is 4- 10', < 45" wide.
- Planking requirements

TSI P.56

Scaffolding

Proper use?

TSI

Aerial Lifts

- Ensure that workers are properly trained
- Maintain and operate elevating work platforms
- Never override hydraulic, mechanical, or electrical safety devices.
- Never move the equipment with workers in an elevated platform unless this is permitted by the manufacturer.

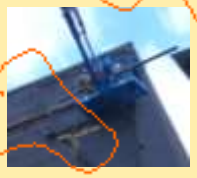
TSI P.56

Aerial Lifts

- Do not allow workers to position themselves between overhead hazards, such as joists and beams, and the rails of the basket.
- Keep at least 10 feet (3 m) away from the nearest overhead lines.
- Always treat powerlines, wires and other conductors as energized
- Use a body harness or restraining belt with a lanyard attached to the boom or basket

TSI P.56

Aerial Lifts



- Set the brakes, and use wheel chocks when on an incline.
- Use outriggers, if provided.
- Do not exceed the load limits of the equipment.
- Allow for the combined weight of the worker, tools, and materials

TSI P.56

Slips, Trips & Falls

- Use slip-resistant rubber soled boots
- Minimize water on floors.
- Use care around air lines and electrical cords.
- Suspend electrical lines and cords.
- No running, jumping, or horseplay in work areas.
- Minimize debris on floors.
- Pick up tools, scrapers, etc.
- Use proper harnesses when needed or required.

TSI P.57

Haz-Com

- Comprehensive written hazard communication program;
- Labeling of hazardous materials;
- Maintaining material safety data sheets;
- Employee training.

TSI

P.57

THE END

TSI