

## Chapter 8 - ASBESTOS

### A. Asbestos Health Effects

Asbestos exposure has been associated with various health effects including asbestosis (a pneumoconiosis) and cancer (including that of the lung, chest or abdomen, larynx, and gastrointestinal tract). Studies allegedly show development of lung cancer after only a single exposure to airborne asbestos fibers. Also, cigarette smoking has been shown to enhance the carcinogenic property of asbestos. Therefore, the use of asbestos substitutes should be encouraged.

### B. Asbestos Use in the Coal Mining Industry

Uses of asbestos in the coal industry include jointings and packing in electrical cable entrances on permissible electrical equipment, brake linings on mobile equipment and large cable reels, gloves for handling hot materials (welders and laboratory workers), welding blankets; thermal insulation of buildings, boilers, and pipelines; and acoustic insulation in offices and other buildings. All of these uses of asbestos represent a potential exposure hazard to employees at mining operations and related worksites. Authorized representatives should be especially vigilant in seeing that asbestos exposure is minimized at construction, renovation and demolition sites.

### C. Asbestos Exposure Standard

The allowable exposure for employees at surface coal mines, the surface work areas of underground coal mines, preparation plants and other surface facilities subject to the provisions of the Federal Mine Safety and Health Act of 1977, as amended, is established by 30 CFR 71.702 as two fibers (greater than 5 microns in length and with an aspect ratio of at least 3 to 1) per cubic centimeter of air as determined over an 8 hour (workday]. However, an exposure of up to 10 fibers/cubic centimeter is allowed for up to 1 hour during each 8 hour [work] day. There is no exposure standard for underground coal mine employees.

### D. Procedure When Asbestos is Suspected

When the presence of asbestos is suspected, the authorized representative should discuss with the mine management (or contractor) the hazards associated with employee exposure to the material.

1. The authorized representative shall procure at least two samples of the suspected material. One sample shall be analyzed in the District by use of one of the commercially available "instantaneous" asbestos testing systems. When the presence of asbestos is positive through the field testing procedure, the second sample shall be sent to the servicing Health Technology Center for confirmation analysis.
2. The district health supervisor shall be promptly informed of any field test result giving a positive indication for asbestos presence. The district health specialist will

make immediate arrangements to have asbestos exposure sampling conducted of the affected mine (or contractor) employees.

#### **E. Asbestos Sampling**

1. Miners to be Sampled:

Personal samples shall be collected where deemed necessary by the District Manager in order to evaluate miner exposure to airborne asbestos fibers.

2. Who May Sample:

Sampling shall be conducted only by persons deemed qualified by the District Manager to conduct such sampling. In determining such qualification, the District Manager should consider such factors as knowledge of contaminant sampling and control techniques.

3. Sampling Equipment and Methodology:

The District Manager shall make sampling equipment available for use by the authorized representatives assigned to conduct asbestos fiber exposure surveys. The specialized devices (other than air pumps) are available upon request from the Health Technology Center servicing the District.

4. Prior to Sampling:

- (a) The appropriate uniform mine file shall be reviewed by the authorized representative prior to sampling.
- (b) Appropriate sampling equipment shall be prepared and calibrated prior to conducting the exposure evaluations. Instructions for the preparation and calibration procedures are available from the Health Technology Center.

5. Conducting the Survey:

Sampling shall be conducted by the authorized representative in accordance with the instructions provided by the Health Technology Center. Samples collected should be sufficient to reflect the exposure over the entire shift or duration of the tasks involving the use of asbestos, whichever is longer.

#### **F. Personal Protective Equipment:**

When the authorized representative reasonably expects to be exposed to asbestos, he/she shall, to the maximum extent feasible, wear appropriate personal protective clothing and respirators.

#### **G. Reporting Sampling Results:**

Results of asbestos sampling for material analysis and exposure assessment purposes shall be recorded on MSHA Form 2000-194, I.H. Sampling Data and a copy of the completed form attached to the inspection report. Also, the appropriate samples and a copy of the completed MSHA Form 2000-194 shall be sent to:

Analytical Branch  
Dust Division, PHTC  
4800-D Forbes Avenue  
Pittsburgh, Pennsylvania 15213

Because the asbestos exposure evaluations may be performed as part of any inspection event, it will not be necessary to prepare a separate Mine Activity Data Report (MSHA Form 2000-22) for the survey. Only when the survey is conducted expressly as an AEA event will a separate MSHA Form 2000-22 be required.

#### **H. Asbestos Bulk Sampling Procedures:**

Taking a sample of asbestos-containing material can damage the material and cause significant release of fibers. The following guidelines are designed to minimize both damage and fiber release:

1. Wear at least a half-face respirator with disposable filters;
2. Wet the surface of the material to be sampled with water from a spray bottle or place a plastic bag around the sampler;
3. Sample with a single-use sampler;
4. With a twisting motion, slowly push the sampler into the material. Be sure to penetrate any paint or protective coating and all the layers of the material;
5. For single-use samplers, extract, wet wipe the exterior, and cap it;
6. Label the container;
7. Clean debris using wet towels and discard them in a plastic bag;
8. For surfacing material, use latex paint or a sealant to cover the sample area. For pipe and boiler insulation, use a nonasbestos mastic; and
9. Contact your district health specialist or the Technical Support Safety and Health Technology Center, Toxic Materials Division, to obtain the sampler/container.

#### **I. Asbestos Airborne Sampling Procedures**

1. Sampling Equipment Required

Personal Sampler Pump: A pump with a flow rate which can be determined within an accuracy of  $\pm 5$  percent. The pump must be calibrated with a representative filter and filter holder in line.

Filter Holder: A three-piece, 37mm filter holder and back-up pad.

Filter: A 0.8 micron pore size mixed cellulose membrane filter.

2. Pump Flow Rate, Sample Volume and Sampling Time

The pump shall be calibrated to a flow rate of 1.5 liters per minute. The sample volume shall be 135 liters; thus, the sampling time shall be 90 minutes.

3. Sample Collection

Assemble the filter, filter pad and three-piece filter holder. Close firmly to ensure that the center ring seats firmly and seals the edge of the filter. If the filter holder will not seal tightly, discard it.

Attach the filter holder to the sampling pump using a 1/4-inch diameter, 3-foot section of tubing and the adapter supplied with the filter holder.

Remove the face cap from the filter holder. Clip the filter holder to the worker's lapel. The open face of the filter should be pointed downward.

Turn the pump on and begin sample collection. Check the pump flow-rate periodically and readjust it if necessary.

Terminate sampling at the predetermined time. Note the sample's flow-rate and collection time. Also, record the ambient temperature and barometric pressure if known. When the barometric pressure is not known, record the approximate elevation at which the sample was taken.

Replace the filter holder face cap and the small inlet and outlet plugs.

Subject one of the filters to the same handling procedures as the sample except draw no air through it. Label this filter as the blank.

4. Sample Submittal

Complete MSHA Form 2000-194 listing all samples and blanks submitted for analysis. Filter holders shall be labeled to correspond to the sample numbers listed on MSHA Form 2000-194.

Ship the samples and a copy of completed MSHA Form 2000-194 in a container designed to prevent damage to the samples to:

Analytical Branch  
Dust Division, PHTC  
4800-D Forbes Avenue  
Pittsburgh, Pennsylvania 15213

5. Additional Information

The filters, filter holder and connecting adapters are available from the Technical Support Health Technology Centers upon request.

**J. Compliance/Noncompliance Determination**

Compliance/noncompliance determinations shall be made by comparing sampling results with the appropriate 8-hour and/or 1-hour exposure standards listed in 30 CFR 71.700 in the case of surface worksite exposures. The appropriate citation or order shall be issued where exposure exceeds either or both standards.