PLAINTIFF'S EXHIBIT

MBL-170

CO-273 (6 64)

INTEROFFICE CORRESPONDENCE

DATE March 18, 1974

TO E. T. Gellenbeck
E. D. Keiper

C.C. R. P. Medlin
E. W. Collins
J. K. Stewart, M.D.
R. L. Wtizke

ASBESTOS DUST EXPOSURE
PROECTION PROCEDURES

Asbestos dust exposure precautions are required when any asbestos bearing insulation is being removed or when the scraps and debris are being cleaned up or handled.

The attached outlines:

(1) A summary of the minimum action that must be taken when employees are working in an area where old insulation is being removed or scraps are being cleaned up or handled.

(2) A digest of the Federal Standards - This digest contains only those portions that could have application at this location.

(3) A copy of the recent OSHA Asbestos Standards.

(4) A list of items which contain asbestos but which are not considered an asbestos dust hazard because they do not emit respirable dust.

Please distribute this information as required to meet compliance.

J. L. Wescoat

Attachments

Clear copy
to S Robinson 8/15/74 (ch)

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INSTRUCTIONS FOR THE PROTECTION OF WORKERS EXPOSED TO ASBESTOS DUST

The attached digest is a distillation of the OSHA standard which pertains to the protection of workers who are exposed to asbestos dust. As a minimum, the following actions must be taken any time asbestos or asbestos-bearing insulation is to be handled.

All persons in the immediate area of the asbestos-insulation-handling operation must wear approved dust respirators per Section 4.2 of the attached digest. Approved respirators may be obtained from the Safety Storeroom.

Caution signs must be posted at all approaches to the area in which asbestos is being handled (see Section 6.1). Caution signs may be obtained from the Safety Storeroom.

All trash and debris which contains asbestos must be disposed of in sealed impermeable bags or containers; each container must display caution labels which may be obtained from the Safety Storeroom.

All insulators are identified on a computer program which automatically schedules each insulator for the annual physical examination as prescribed in Section 9.2 of the attached digest.

The following insulation bearing materials do not emit respirable dust in their use, storage and handling. No protective measures are required in connection with their handling and use:

Welding blankets
Asbestos gloves
Gaskets

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RWMasters:jl
10-1-73

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ASBESTOS HANDLING GUIDE

Asbestos is a hydrated magnesium silicate which is commonly used for heat insulation and in textile products which must resist high temperatures. Inhalation of excessive quantities of asbestos fiber can be hazardous to a person's health.

The Occupational Safety and Health Administration (OSHA) has issued a standard concerning the requirements for handling asbestos. Included are precautions necessary to avoid releasing airborne fibers, required personal protective equipment, correct handling procedures, environmental monitoring, medical examinations, and employee exposure records. A Management Guide Bulletin has been released concerning "Medical Supervision of Asbestos Workers," Number 03-1308. The Management Guide refers to the OSHA standard and requires its use.

Because the OSHA standard is particularly difficult to read and comprehend, the attached has been drafted to serve as a distillation and compilation of the OSHA standard.

The installation of asbestos bearing mortar and asbestos type thermal insulation has been discontinued. When asbestos bearing insulation is removed during equipment maintenance, it is to be replaced with asbestos free insulation. Measurements of airborne asbestos fiber concentration have been made on several occasions when old asbestos bearing insulation was being removed; the results indicated that the airborne concentrations were significantly below the permissible time weighted average concentration.

Some actions are required by the standard regardless of the concentration of airborne fibers. The reference numbers of these particular items are underscored.

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ASBESTOS DUST

A DIGEST OF OSHA STANDARD

The items shown below are in the order in which they appear in the OSHA standard. They are intended to serve as a working guide for use in the field. When questions arise which are not covered by this digest, the attached copy of the OSHA standard should be consulted.

1. Permissible Exposure Levels

   1.1 The permissible time weighted average (TWA) concentration of airborne asbestos fiber is 5 fibers greater than 5 microns in length per cubic centimeter of air over an 8-hour exposure period. In 1976 the TWA will be reduced to 2 fibers greater than 5 microns in length per cubic centimeter of air.

   1.2 The permissible ceiling concentration, i.e., the maximum allowable concentration regardless of exposure time is 10 fibers greater than 5 microns in length per cubic centimeter of breathing air.

2. Local Exhaust Ventilation

   2.1 Local exhaust ventilation is required for hand and power tools which may produce or release asbestos fibers in excess of the permissible concentration levels.

   2.2 All ventilation and collection systems must be designed and installed in accordance with the American National Standard, ANSI Z9.2 - 1971.

3. Work Methods

   3.1 Wet Method -- Where practical, asbestos bearing material should be kept wet throughout the entire exposure period to prevent releasing fibers in excess of the permissible concentration levels.

4. Personal Protective Equipment

   4.1 Compliance with the standard through the use of respirators and shift rotation may not be used except:

      4.1.1 Until engineering controls can be implemented, or

      4.1.2 Suitable work practices can be implemented, or

      4.1.3 The above two are not feasible, or

      4.1.4 In emergency work.

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4.2 Respiratory Protection

4.2.1 Where either respirators or personnel rotation is applicable, OSHA states that personnel rotation is preferred.

4.2.2 Respirators must be approved by the Bureau of Mines or NIOSH. The type employed must be suitable for the expected concentrations as shown below.

4.2.3 Air purifying respirators, either the reusable or single-use type, shall be used by employees who are present where asbestos is being removed or where asbestos scrap or debris are being handled. This type of respirator may be used for exposures in which the airborne concentration is not expected to exceed 10 times the permissible TWA concentration (50 fibers greater than 5 microns in length per cubic centimeter of air). Approved respirators are available from the Safety Storeroom.

4.2.4 Powered air purifiers (air compressor supply) shall be used when the airborne concentration does not exceed 100 times the permissible TWA concentration (500 fibers greater than 5 microns in length per cubic centimeter of air).

4.2.5 Type C continuous flow or pressure demand supplied air respirators (Scott Air Pacs or air cylinders) shall be used when the airborne concentration is expected to exceed 100 times the permissible TWA concentration (500 fibers greater than 5 microns in length per cubic centimeter of air).

4.2.6 A respiratory training program shall be established in accordance with ANSI Z88.2 - 1969, where respirators of any class or type are, or may be, required.

4.2.7 Employees who, according to a medical examination, cannot function normally with a respirator shall not be assigned to work requiring a respirator. They shall be assigned to other work in the same geographic location and at the same pay and seniority, if such work is available.

4.3 Special Clothing and Lockers

4.3.1 Special clothing shall be provided and used if the concentration is expected to exceed the permissible TWA concentration (5 fibers greater than 5 microns in length per cubic centimeter of air).

4.3.2 Change rooms are required for employees working regularly at a fixed place of employment where the concentration is expected to exceed the permissible TWA concentration.

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4.3.3 Two separate change lockers or containers shall be provided for each employee to prevent contamination of street clothes by contact with work clothes. The two change lockers are required only if a change room is required per 4.3.2 above.

4.3.4 Laundering asbestos contaminated clothes shall be performed so as to prevent releasing asbestos fibers in excess of the permissible TWA concentration.

4.3.5 Employers giving asbestos contaminated clothes to someone for laundering shall inform that person or agent about the requirements to prevent his releasing excessive amounts of asbestos fibers. The standard does not specify whether or not an employee is required to inform the launderer under similar circumstances.

4.3.6 Contaminated clothes shall be transported in a sealed container which displays a caution label. (See attached for details of the label.)

5. Method of Concentration Measurement

5.1 Airborne fiber concentration measurements -- This is done by a qualified person using the prescribed type vacuum pump and membrane filter. The filter cassette is then sent to a commercial laboratory equipped to count the fibers.

5.2 Initial monitoring must be done in the places of employment where fibers are released to determine the concentration of airborne asbestos fibers. If the concentration is above the permissible TWA concentration, a compliance program must be undertaken immediately. Initial measurements of the concentration of airborne asbestos fibers performed in the Beaumont Refinery indicated that airborne concentrations were well below the permissible TWA concentration.

5.3 Personal monitoring must be done by sampling at the breathing zone to determine the airborne asbestos concentration. Sufficient samples shall be taken to determine the 8-hour TWA concentration and the maximum or ceiling concentration of asbestos fibers. The sampling interval and pattern will be performed in a manner so as to represent, with reasonable accuracy, the actual level of employee exposure. If the exposure may reasonably exceed the permissible TWA concentration, then the sampling interval may not exceed a 6-month period.

Personal monitoring performed in the Beaumont Refinery indicated that airborne concentrations were significantly below the permissible TWA concentration.

5.3.1 Samples must be collected on membrane filters of 0.8 micron porosity which are mounted in an open-face filter holder.

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5.4 Environmental monitoring -- This is nearly identical to the requirements spelled out in the personal monitoring section described above in 5.3.

5.5 Affected employees or their representative are to have a reasonable opportunity to observe the monitoring process and have access to the results of that monitoring.

6. Caution Signs and Labels

6.1 Caution signs are to be displayed where airborne concentrations may exceed the permissible TWA concentration. They shall be located at all approaches and far enough from the location so that employees may take protective measures before entering the location.

6.2 Caution labels shall be attached to all containers of asbestos raw material, waste, scrap, debris, and contaminated clothing, unless the asbestos fibers have been modified by a bonding agent or some binder which will prevent the release of asbestos fibers to the air during any reasonably foreseeable use, handling, transportation, or disposal of material.

6.3 Caution signs and container labels are available from the Safety Storeroom.

7. Housekeeping

7.1 Housekeeping -- External surfaces shall be kept clear of accumulated asbestos fibers which if dispersed would be in excessive concentration. The accumulation described has not been quantified.

7.2 Waste Disposal -- Asbestos waste, scrap, and clothing consigned for disposal which may in a reasonably foreseeable use, handling, transportation or disposal, release asbestos fibers, shall be collected and disposed of in sealed impermeable containers. A caution label shall be attached, unless the fibers are modified by a suitable bonding agent or binder.

8. Record Keeping

8.1 Exposure records as determined from personal and environmental monitoring shall be kept for at least three years. They shall be made available to OSHA and NIOSH personnel, and employees or former employees whose own exposure may be shown in these records.

8.2 Employee exposure notification -- Any employee found to have been exposed to concentrations in excess of the permissible TWA concentration is to be notified in writing as soon as possible and not later than five days after the finding. He shall also be timely notified of the corrective action being taken.

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9. Medical Examinations

9.1 Preplacement examinations -- The employer shall provide or make available to each of his employees who are exposed to airborne asbestos fibers, a comprehensive medical examination at the employer's expense. The examination must be performed within 30 days following the first work exposure to asbestos fibers. Examinations are not mandatory by the federal law. If the employee refuses to take the examination, a signed statement of refusal is required.

9.2 Annual examinations are required for employees who may be exposed on or before January 31, 1973, and at least annually thereafter. All insulators are identified on a computer program which automatically schedules each insulator for the required physical examination.

9.3 Termination of employment -- The employer shall provide or make available a comprehensive medical examination within 30 days before or after employment is terminated. However, no examination need be provided if records show that the employee has been examined within the past one-year period.

9.4 Medical records shall be kept at least 20 years. They shall be available for examination or copying by OSHA, NIOSH, present employees, former employees, and employee's personal physician. The physician who performs such an examination shall furnish the employer all the information related to the employee's occupational exposure to asbestos.

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TABLE G-2

Material	8-hour time weighted average	Acceptable ceiling concentration	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hour shift.	
			Concentration	Maximum duration
Benzene (Z37.4-1969)	10 p.p.m	25 p.p.m	50 p.p.m	10 minutes.
Beryllium and beryllium compounds	2 μg./M³	5 μg./M³	25 μg./M³	30 minutes.
Carbon tetrachloride (Z37.5-1970)	0.1 mg./M³	3 mg./M³		
Cadmium fume (Z37.5-1970)	0.2 mg./M³	0.6 mg./M³		
Cadmium oxide (Z37.5-1970)	50 p.p.m	300 p.p.m	(1) p.p.m	Do.
Carbon tetrachloride (Z37.17-1967)	10 p.p.m	25 p.p.m	200 p.p.m	5 minutes in any 4 hours.
Ethylene dibromide (Z37.31-1971)	20 p.p.m	30 p.p.m	50 p.p.m	5 minutes.
Methylene dichloride (Z37.14-1969)	50 p.p.m	100 p.p.m	200 p.p.m	5 minutes in any 2 hours.
Formaldehyde (Z37.16-1969)	3 p.p.m	5 p.p.m	10 p.p.m	30 minutes.
Hydrazine (Z37.23-1970)	do			
Pharmaceuticals (Z37.23-1970)	5 mg./M³			
Lead and its inorganic compounds (Z37.11-1969).	0.2 mg./M³			
Methyl chloride (Z37.15-1969)	100 p.p.m	200 p.p.m	300 p.p.m	5 minutes in any 4 hours.
Methylene Chloride (Z37.3-1968)	500 p.p.m	1,000 p.p.m	2,500 p.p.m	5 minutes in any 4 hours.
Organic (alkyl) mercury (Z37.30-1969)	0.01 mg./M³	0.04 mg./M³		
Styrene (Z37.15-1969)	100 p.p.m	200 p.p.m	600 p.p.m	5 minutes in any 3 hours.
Tetrachloroethylene (Z37.19-1967)	do	do	300 p.p.m	5 minutes in any 3 hours.
Tetrachloroethylene (Z37.22-1967)	do	do	do	5 minutes in any 3 hours.
Toluene (Z37.12-1967)	200 p.p.m	300 p.p.m	500 p.p.m	10 minutes.
Trichloroethylene (Z37.22-1969)	100 p.p.m	200 p.p.m	300 p.p.m	10 minutes once only if no other measurable exposure occurs.
Vinyl chloride (Z37.14-1971)	1 mg./10M³			
Chromic acid and chromates (Z37.7-1971)	do			

TABLE G-3—MINERAL DUSTS

Substance	Mppcf	Mg/M³
Silica:		
Crystalline:		
Quartz (respirable)	250 / %SiO₂+5	10mg/M³ = %SiO₂+2
Quartz (total dust)		30mg/M³ %SiO₂+2
Cristobalite: Use ½ the value calculated from the count or mass formulae for quartz.		
Tridymite: Use ½ the value calculated from the formulae for quartz.		
Amorphous, including natural diatomaceous earth	20	80mg/M³ %SiO₂
Silicates (less than 1% crystalline silica):		
Mica	20	
Soapstone	20	
Talc (non-asbestos form)	20	
Talc (fibrous). Use asbestos limit		
Tremolite (see talc, fibrous)		
Portland cement	50	
Graphite (natural)	15	
Coal dust (respirable fraction less than 5% SiO₂)		2. (mg/M³ or 10mg/M³ %SiO₂+2
For more than 5% SiO₂		
Inert or Nuisance Dust:		
Respirable fraction	15	5mg/M³
Total dust	50	15mg/M³

NOTE: Conversion factors—
mppcf×35.3=number particles per cubic meter
mg/M³×0.028=mg/cf

* Millions of particles per cubic foot of air, based on impinger samples counted by light-field techniques.

† The percentage of crystalline silica in the formula is the value determined from airborne samples, except in those instances in which other methods have been shown to be applicable.

‡ As determined by the membrane filter method at 430× magnification (4-mm objective, 10× eyepiece).

§ Both concentration and percent quartz for the application of this formula are to be determined from the fraction passing a selector with the following characteristics:

Aerodynamic diameter (unit density sphere)	Percent passing selector
2	90
2.5	75
3.5	50
5.0	25
10	0

The measurements under this note refer to the use of an AEC instrument. If the respirable fraction of coal dust is determined with a MRE the figure corresponding to that of 2.4 Mg/M³ in the table for coal dust is 1.5 Mg/M³.

§ 1910.93a Asbestos.

(a) *Definitions.* For the purpose of this section, (1) "Asbestos" includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.

(2) "Asbestos fibers" means asbestos fibers longer than 5 micrometers.

(b) *Permissible exposure to airborne concentrations of asbestos fibers*—(1) *Standard effective July 7, 1972.* The 8-hour time-weighted average airborne concentrations of asbestos fibers to which any employee may be exposed shall not exceed five fibers, longer than 5 micrometers, per cubic centimeter of air, as determined by the method prescribed in paragraph (e) of this section.

(2) *Standard effective July 1, 1976.* The 8-hour time-weighted average airborne concentrations of asbestos fibers to which any employee may be exposed shall not exceed two fibers, longer than 5 micrometers, per cubic centimeter of air, as determined by the method prescribed in paragraph (e) of this section.

(3) *Ceiling concentration.* No employee shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers, longer than 5 micrometers, per cubic centimeter of air, as determined by the method prescribed in paragraph (e) of this section.

(c) *Methods of compliance*—(1) *Engineering methods.* (i) *Engineering controls.* Engineering controls, such as, but not limited to, isolation, enclosure, exhaust ventilation, and dust collection, shall be used to meet the exposure limits prescribed in paragraph (b) of this section.

(ii) *Local exhaust ventilation.* (a) Local exhaust ventilation and dust collection systems shall be designed, constructed, installed, and maintained in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2–1971, which is incorporated by reference herein.

(b) See § 1910.6 concerning the availability of ANSI Z9.2–1971, and the maintenance of a historic file in connection therewith. The address of the American National Standards Institute is given in § 1910.100.

(iii) *Particular tools.* All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section, such as, but not limited to, saws, scorers, abrasive wheels, and drills, shall be provided with local exhaust ventilation systems in accordance with subdivision (ii) of this subparagraph.

(2) *Work practices*—(i) *Wet methods.* Insofar as practicable, asbestos shall be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state sufficient to prevent the emission of airborne fibers in excess of the exposure limits prescribed in paragraph (b) of this section, unless the usefulness of the product would be diminished thereby.

(ii) *Particular products and operations.* No asbestos cement, mortar, coating, grout, plaster, or similar material containing asbestos shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, or enclosed, or ventilated so as to prevent effectively the release of airborne asbestos fibers in excess of the limits prescribed in paragraph (b) of this section.

(iii) *Spraying, demolition, or removal.* Employees engaged in the spraying of asbestos, the removal, or demolition of pipes, structures, or equipment covered or insulated with asbestos, and in the removal or demolition of asbestos insulation or coverings shall be provided with respiratory equipment in accordance with paragraph (d)(2)(iii) of this section and with special clothing in accordance with paragraph (d)(3) of this section.

(d) *Personal protective equipment*—(1) Compliance with the exposure limits prescribed by paragraph (b) of this section may not be achieved by the use of respirators or shift rotation of employees, except:

(i) During the time period necessary to install the engineering controls and to institute the work practices required by paragraph (c) of this section;

(ii) In work situations in which the methods prescribed in paragraph (c) of

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this section are either technically not feasible or feasible to an extent insufficient to reduce the airborne concentrations of asbestos fibers below the limits prescribed by paragraph (b) of this section; or

(iii) In emergencies.

(iv) Where both respirators and personnel rotation are allowed by subdivisions (i), (ii), or (iii) of this subparagraph, and both are practicable, personnel rotation shall be preferred and used.

(2) Where a respirator is permitted by subparagraph (1) of this paragraph, it shall be selected from among those approved by the Bureau of Mines, Department of the Interior, or the National Institute for Occupational Safety and Health, Department of Health, Education, and Welfare, under the provisions of 30 CFR Part 11 (37 F.R. 5411, Mar. 25, 1972), and used or worn in accordance with subdivisions (i), (ii), (iii), and (iv) of this subparagraph.

(i) *Air purifying respirators.* A reusable or single use air purifying respirator, or a respirator described in subdivision (ii) or (iii) of this subparagraph, shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits prescribed in paragraph (b) of this section, when the ceiling or the 8-hour time-weighted average airborne concentrations of asbestos fibers are reasonably expected to exceed no more than 10 times those limits.

(ii) *Powered air purifying respirators.* A full facepiece powered air purifying respirator, or a powered air purifying respirator, or a respirator described in subdivision (iii) of this subparagraph, shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits prescribed in paragraph (b) of this section, when the ceiling or the 8-hour time-weighted average concentrations of asbestos fibers are reasonably expected to exceed 10 times, but not 100 times, those limits.

(iii) *Type "C" supplied-air respirators, continuous flow or pressure-demand class.* A type "C" continuous flow or pressure-demand, supplied-air respirator shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits prescribed in paragraph (b) of this section, when the ceiling or the 8-hour time-weighted average airborne concentrations of asbestos fibers are reasonably expected to exceed 100 times those limits.

(iv) *Establishment of a respirator program.* (a) The employer shall establish a respirator program in accordance with the requirements of the American National Standards Practice for Respiratory Protection, ANSI Z88.2-1969, which is incorporated by reference herein.

b. See § 1910.6 concerning the availability of ANSI Z88.2-1969 and the maintenance of an historic file in connection therewith. The address of the American National Standards Institute is given in § 1910.160.

(c) No employee shall be assigned to tasks requiring the use of respirators if, based upon his most recent examination, an examining physician determines that the employee will be unable to function normally wearing a respirator, or that the safety or health of the employee or other employees will be impaired by his use of a respirator. Such employee shall be rotated to another job or given the opportunity to transfer to a different position whose duties he is able to perform with the same employer, in the same geographical area and with the same seniority, status, and rate of pay he had just prior to such transfer, if such a different position is available.

(3) Special clothing: The employer shall provide, and require the use of, special clothing, such as coveralls or similar whole body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos fibers, which exceed the ceiling level prescribed in paragraph (b) of this section.

(4) Change rooms: (i) At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section, the employer shall provide change rooms for employees working regularly at the place.

(ii) Clothes lockers: The employer shall provide two separate lockers or containers for each employee, so separated or isolated as to prevent contamination of the employee's street clothes from his work clothes.

(iii) Laundering: (a) Laundering of asbestos contaminated clothing shall be done so as to prevent the release of airborne asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section.

(b) Any employer who gives asbestos-contaminated clothing to another person for laundering shall inform such person of the requirement in (a) of this subdivision to effectively prevent the release of airborne asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section.

(c) Contaminated clothing shall be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with paragraph (g) of this section.

(e) *Method of measurement.* All determinations of airborne concentrations of asbestos fibers shall be made by the membrane filter method at 400–450 X (magnification) (4 millimeter objective) with phase contrast illumination.

(f) *Monitoring*—(1) *Initial determinations.* Within 6 months of the publication of this section, every employer shall cause every place of employment where asbestos fibers are released to be monitored in such a way as to determine whether every employee's exposure to asbestos fibers is below the limits prescribed in paragraph (b) of this section. If the limits are exceeded, the employer shall immediately undertake a compliance program in accordance with paragraph (c) of this section.

(2) *Personal monitoring*—(i) *Samples shall be collected from within the breathing zone of the employees, on membrane filters of 0.3 micrometer porosity mounted in an open-face filter holder. Samples shall be taken for the determination of the 8-hour time-weighted average airborne concentrations and of the ceiling concentrations of asbestos fibers.*

(ii) *Sampling frequency and patterns.* After the initial determinations required by subparagraph (1) of this paragraph, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees. In no case shall the sampling be done at intervals greater than 6 months for employees whose exposure to asbestos may reasonably be foreseen to exceed the limits prescribed by paragraph (b) of this section.

(3) *Environmental monitoring*—(i) *Samples shall be collected from areas of a work environment which are representative of the airborne concentrations of asbestos fibers which may reach the breathing zone of employees. Samples shall be collected on a membrane filter of 0.3 micrometer porosity mounted in an open-face filter holder. Samples shall be taken for the determination of the 8-hour time-weighted average airborne concentrations and of the ceiling concentrations of asbestos fibers.*

(ii) *Sampling frequency and patterns.* After the initial determinations required by subparagraph (1) of this paragraph, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of the employees. In no case shall sampling be at intervals greater than 6 months for employees whose exposures to asbestos may reasonably be foreseen to exceed the exposure limits prescribed in paragraph (b) of this section.

(4) *Employee observation of monitoring.* Affected employees, or their representatives, shall be given a reasonable opportunity to observe any monitoring required by this paragraph and shall have access to the records thereof.

(g) *Caution signs and labels.* (1) *Caution signs.* (i) *Posting.* Caution signs shall be provided and displayed at each location where airborne concentrations of asbestos fibers may be in excess of the exposure limits prescribed in paragraph (b) of this section. Signs shall be posted at such a distance from such a location so that an employee may read the signs and take necessary protective steps before entering the area marked by the signs. Signs shall be posted at all approaches to areas containing excessive concentrations of airborne asbestos fibers.

(ii) *Sign specifications.* The warning signs required by subdivision (i) of this subparagraph shall conform to the requirements of 20" x 14" vertical format signs specified in § 1910.145(d)(4), and to this subdivision. The signs shall display the following legend in the lower panel, with letter sizes and style of a visibility at least equal to that specified in this subdivision.

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Legend	Notation
Asbestos	1" Sans Serif, Gothic or Block.
Dust Hazard	¾" Sans Serif, Gothic or Block.
Avoid Breathing Dust	¼" Gothic.
Wear Assigned Protective Equipment.	¼" Gothic.
Do Not Remain In Area Unless Your Work Requires It.	¼" Gothic.
Breathing Asbestos Dust May Be Hazardous To Your Health.	14 point Gothic.

Spacing between lines shall be at least equal to the height of the upper of any two lines.

(2) *Caution labels*—(i) *Labeling.* Caution labels shall be affixed to all raw materials, mixtures, scrap, waste debris, [illegible] containing asbestos fibers, or to their containers, except that no label is required where asbestos fibers have been bonded by a bonding agent, coating, binder, or other material so that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section will be released.

(ii) *Label specifications.* The caution labels required by subdivision (i) of this subparagraph shall be printed in letters of sufficient size and contrast as to be readily visible and legible. The label shall state:

CAUTION

Contains Asbestos Fibers

Avoid Creating Dust

Breathing Asbestos Dust May Cause Serious Bodily Harm

(h) *Housekeeping*—(1) *Cleaning.* All external surfaces in any place of employment shall be maintained free of accumulations of asbestos fibers if, with their dispersion, there would be an excessive concentration.

(2) *Waste disposal.* Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, consigned for disposal, which may produce in any reasonably foreseeable use, handling, storage, processing, disposal, or transportation airborne concentrations of asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section shall be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

(i) *Recordkeeping*—(1) *Exposure records.* Every employer shall maintain records of any personal or environmental monitoring required by this section. Records shall be maintained for a period of at least 3 years and shall be made available upon request to the Assistant Secretary of Labor for Occupational Safety and Health, the Director of the National Institute for Occupational Safety and Health, and to authorized representatives of either.

(2) *Employee access.* Every employee and former employee shall have reasonable access to any record required to be maintained by subparagraph (1) of this paragraph, which indicates the employee's own exposure to asbestos fibers.

(3) *Employee notification.* Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the limits prescribed in paragraph (b) of this section shall be notified in writing of the exposure as soon as practicable but not later than 5 days of the finding. The employee shall also be timely notified of the corrective action being taken.

(j) *Medical examinations*—(1) *General.* The employer shall provide or make available at his cost, medical examinations relative to exposure to asbestos required by this paragraph.

(2) *Preplacement.* The employer shall provide or make available to each of his employees, within 30 calendar days following his first employment in an [illegible] concentrations of asbestos fibers, a comprehensive medical examination, which shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 x 17 inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$).

(3) *Annual examinations.* On or before January 31, 1973, and at least annually thereafter, every employer shall provide, or make available, comprehensive medical examinations to each of his employees engaged in occupations exposed to airborne concentrations of asbestos fibers. Such annual examination shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 x 17 inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$).

(4) *Termination of employment.* The employer shall provide, or make available, within 30 calendar days before or after the termination of employment of any employee engaged in an occupation exposed to airborne concentrations of asbestos fibers, a comprehensive medical examination which shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 x 17 inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$).

(5) *Recent examinations.* No medical examination is required of any employee, if adequate records show that the employee has been examined in accordance with this paragraph within the past 1-year period.

(6) *Medical records*—(i) *Maintenance.* Employers of employees examined pursuant to this paragraph shall cause to be maintained complete and accurate records of all such medical examinations. Records shall be retained by employers for at least 20 years.

(ii) *Access.* The contents of the records of the medical examinations required by this paragraph shall be made available, for inspection and copying, to the Assistant Secretary of Labor for Occupational Safety and Health, the Director of NIOSH, to authorized physicians and medical consultants of either of them, and, upon the request of an employee or former employee, to his physician. Any physician who conducts a medical examination required by this paragraph shall furnish to the employer of the examined employee all the information specifically required by this paragraph, and any other medical information related to occupational exposure to asbestos fibers.

§ 1910.94 Ventilation.

(a) *Abrasive blasting*—(1) *Definitions applicable to this paragraph.*—(i) *Abrasive.* A solid substance used in an abrasive blasting operation.

(ii) *Abrasive-blasting respirator.* A continuous flow air-line respirator constructed so that it will cover the wearer's head, neck, and shoulders to protect him from rebounding abrasive.

(iii) *Blast cleaning barrel.* A complete enclosure which rotates on an axis, or which has an internal moving blend to tumble the parts, in order to expose various surfaces of the parts to the action of an automatic blast spray.

(iv) *Blast cleaning room.* A complete enclosure in which blasting operations are performed and where the operator works inside of the room to operate the blasting nozzle and direct the flow of the abrasive material.

(v) *Blasting cabinet.* An enclosure where the operator stands outside and operates the blasting nozzle through an opening or openings in the enclosure.

(vi) *Clean air.* Air of such purity that it will not cause harm or discomfort to an individual if it is inhaled for extended periods of time.

(vii) *Dust collector.* A device or combination of devices for separating dust from the air handled by an exhaust ventilation system.

(viii) *Exhaust ventilation system.* A system for removing contaminated air from a space, comprising two or more of the following elements (*a*) enclosure or hood, (*b*) duct work, (*c*) dust collecting equipment, (*d*) exhauster, and (*e*) discharge stack.

(ix) *Particulate-filter respirator.* An air purifying respirator, commonly referred to as a dust or a fume respirator, which removes most of the dust or fume from the air passing through the device.

(x) *Respirable dust.* Airborne dust in sizes capable of passing through the upper respiratory system to reach the lower lung passages.

(xi) *Rotary blast cleaning table.* An enclosure where the pieces to be cleaned are positioned on a rotating table and are passed automatically through a series of blast sprays.

(xii) *Abrasive blasting.* The forcible application of an abrasive to a surface by pneumatic pressure, hydraulic pressure, or centrifugal force.

(2) *Dust hazards from abrasive blasting.* (i) Abrasives and the surface coatings on the materials blasted are shattered and pulverized during blasting

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