

UNITED STATES OF AMERICA
GENERAL SERVICES ADMINISTRATION



DATE: SEP 12 1974

Federal Supply Service
Washington, DC 20406

REPLY TO
ATTN OF: FJ

SUBJECT: Stockpile Storage Manual Pages for Asbestos

1F, 2F, 3F, 4F, 5F, 7F, and 9F

Storage Manual pages for asbestos are in the process of being amended, however, it will be several weeks before the replacement pages will be published. In the meantime, we ask for all related work with asbestos at GSA-FSS depots, to be guided by the enclosed "proposed" manual pages until they can be finalized, published, and distributed. Kindly furnish a copy of the "proposed" manual pages to any military depots in your region who has stockpile asbestos so that they may be aware of our action in this respect. These pages are currently being cleared with the military and other Government offices in Washington, D. C.

For more detailed and precise information entailing the health aspects, we are also enclosing a copy of the present health and safety standards of the Occupational Safety and Health Administration (OSHA), as presently required for work involving asbestos.

E. M. STOREY, JR
Assistant Commissioner
Office of Property Management

2 Enclosures

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STORAGE OF ASBESTOS

1. Description:

Asbestos is a mineral in fibrous form. It may be received in any of the following types and grades:

Amosite

Amosite asbestos is coarse and shaggy, gray to brown in color and is presently used as a thermal insulating material in shipboard applications.

Grades - D3, D11, DX, MD, M, K3 and W3 (other former grades - B-1, B-3, 3/DM-1 and M-1).

Chrysotile

Chrysotile asbestos is received in lump and crude form and when partly "opened" it varies from yellowish-white to grayish-white, white when fiberized. It is used chiefly for dielectric insulation of cables and other electrical equipment.

a. Milled Fiber: Grades - 1, 2, 3, 4, 5 and 6 (other former grades - C&G-1, C&G-2, C&G-3, C&G-4, 3K and 3T).

b. Crude Fiber: Grades - Crude No. 1, Crude No. 2 and Crude No. 3

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Crocidolite

Crocidolite asbestos ranges from lavender-blue to dark blue in color and is used chiefly in the manufacture of asbestos cement pipe, packing and gaskets.

a. Crocidolite-Blue, Bolivian: Grades - Crude No. 1, Crude No. 2 and Run-of-Mine (Crude or Milled).

b. Crocidolite-South African: From Transvaal, South Africa. Grades - D, C, B, A and S.

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c. Crocidolite-Marsh: From Cape Province, South Africa and Mamersley Range, West Australia. Grades - D, C, B, A and S.

2. Packaging:

Asbestos purchased through the mid to late 1960's for the national stockpile, was packaged in either burlap bags or osnaburg bags which contained an asbestos weight of from 100 to 150 pounds each. Any future asbestos purchased for the national stockpile will be pressurized packed in polyethylene liners, which shall be black in color and 4 to 5 mils thick. The polyethylene liner shall be heat sealed and then covered with a preservative treated burlap bag or an osnaburg bag. All bags of any given lot shall be of the same nominal size and shape and of the same type and kind of package material.

3. Marking:

a. Early receipts of stockpile asbestos had markings on the bags indicating the name and kind of material, name of supplier, name and location (including State and Province) of mine, grade, gross and net weights and Government contract number. In addition, some bags were marked with the lot number and bag serial number of its respective lot. The bag markings of future purchases will contain all of this information as well as warning notices "Handle With Care" and an appropriate caution concerning (when required) the use of respirators. (Chrysotile asbestos bags may also indicate the respective magnetic rating of the material).

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b. To facilitate the segregation of each lot of asbestos in conveyances containing mixed lots, a color marking will be found on each end of the bag. The color marking has no permanent record or identification value and it is applied only to permit rapid recognition of each lot during shipment to the depot and for unloading and storing at the depot. After a lot of asbestos has been tallied and stored, the color mark is to be disregarded since the same color may be used by the shipper at a later date to identify a lot of a different type and grade of asbestos.

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4. Storage:

a. All asbestos shall be segregated in storage and identified in depot records by program (SCM, DPA, USS or CCC), type, grade, and lot number. The Magnetic Rating for each lot of chrysotile shall also be maintained in the depot records when such information is available.

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b. Stockpile asbestos on hand may consist of any of the following methods of storage:

- (1) In bags as received, in a dry, sprinklered warehouse in box pallets.
- (2) In bags as received, in a dry, sprinklered warehouse, in block stack fashion using flat pallets for floor dunnage only.
- (3) With bags removed, in clean, dry, sound steel tanks of the type formerly used as portable, field, oil storage tanks.
- (4) In bulk, in wooden bins constructed in a dry, sprinklered warehouse.

The method of storage to be used for future purchases of stockpile asbestos shall be restricted to that of No. (1) above. Present inventories shall remain in their respective method of storage pending action to ship against sales contracts. During the interim, however, should the need occur to move any material for reasons other than to meet shipments against sales, the method of continued storage (after such movement) shall be first coordinated and approved by the Stockpile Storage Division, Washington, DC.

c. The use of box hooks for handling bags of asbestos (whether the bag be new or old) is prohibited. Bags which have been damaged (torn or ripped, leaving an opening) must be adequately repaired, repacked or overpackaged and remarked within the authority contained in Section IV, Paragraph 5, Repair of Damaged Containers, Page 35, this manual.

d. Orderly storage, appropriate stack identification, and accurate records facilitate the taking of a physical inventory and the selection of materials for outshipment.

Box Pallets: The same number of bags shall be placed in each box pallet and the pallets shall be arranged in uniform rows and to uniform height, residual bags of a given lot may be stored on top of the box pallets, on a flat pallet, provided stacking height permits. When a block of storage in box pallets is completed, a placard shall be conspicuously placed to indicate the quantity of bags in the entire block of storage.

NOTE: A few depots may be authorized to cover warehouse storage of asbestos, with special tarpaulins. This work will be handled as a special project and arrangements will be initiated by the Stockpile Division, Washington, DC. After such stocks have been depleted, and the tarps become available for other uses, care

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should be exercised to prevent the spread of potential asbestos contaminants by making certain said tarps are adequately free of asbestos particles and dust. If for any reason, any tarp cannot be appropriately cleaned for additional use, disposal of the tarp in keeping with ecological regulations controlling at that time should be in order.

e. With regard to warehouse storage, main transportation aisles will be a minimum of six (6) feet in width. Maximum storage height will be fifteen (15) feet or at least thirty-six (36) inches below automatic sprinkler heads and overhead structural members (including lower chord and other roof truss members, beams and girders, but excluding vertical supporting columns, etc.). Individual block stacks will be limited to 3,000 square feet in floor area. A minimum clearance of twenty-four (24) inches will be maintained between stacks and exterior walls, fire walls, fire doors and fire door openings. A clearance of eighteen (18) inches will be maintained between piles and heating appliances, piping, electrical wiring and fixtures, etc. Clearance between storage piles will be at least four (4) feet except as specified for main transportation aisles. In addition, refer to photograph of typical bag storage in box pallets in Appendix B and General Uniform Standards for Fire Protection Appendix C.

5. Outshipment Procedure

Outshipment orders normally will be issued jointly by Transportation and Communications Service and Property Management and Disposal Service on GSA Form 460 "Shipping Instructions" (See Section III, Storage Manual) or GSA Form 7543 (Formerly DMS 62) "Shipment Order," or by other instructions issued by Property Management and Disposal Service as authorized by Section I of this manual. Outshipment orders will designate type, grade, lot number, contract number, net weight and other information necessary to identify the material to be shipped.

6. Precautions to be taken:

- a. Health: Asbestosis and other serious health ailments have been attributed to the inhalation or injection of asbestos dust, usually after a long period of time. Strict precautions must be taken by personnel who may become exposed to asbestos dust or airborne particles. Such personnel shall wear a respiratory protective device of the type and kind approved for this purpose by the Bureau of Mines, Department of the Interior, or the National Institute of Occupational Safety and Health, Department of Health, Education and Welfare under provisions of 30 CFR, Part 11 (37FR 6244, Mar. 25, '72). All street clothes shall be removed and replaced with work clothes including head covers and feet covering prior to handling asbestos. Such work clothes, etc., shall be kept separate from street clothes at all times. The laundering

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of work clothes shall be controlled by the depot. After removing work clothes, all personnel who have been exposed to asbestos dust must take showers or wash thoroughly. All monitoring, personnel health requirements and cleaning records shall be established and maintained in accordance with requirements set forth by governing occupational safety and health standards. The standards as presently required will probably remain reasonably stable, however, the methods of employing the physical aspects may vary from depot to depot, depending on the circumstance and conditions prevailing at each given depot. The most practical and economical work methods or procedures can best be determined only upon consideration of the specifics involved at any given depot. In any event all work, procedures, health standards, etc., shall be within the framework of that required by the respective regulatory agency, i.e., HEW, OSHA, DOT, EPA, etc.

- b. General: Bags must be kept dry to prevent mildew of the bags and resulting deterioration which might contaminate asbestos with bag particles. Moisture tends to "cake" material, particularly chrysotile, which impairs its usefulness. In other respects ordinary moisture does not harm asbestos except that it must always be removed before processing. Bags of asbestos should be kept reasonably free of dust. Dusty bagged materials like tannins and graphite should not be handled in the vicinity of stored asbestos.

7. Storage Factors:

60 to 90 cubic feet per short ton
630 to 980 short tons per 10,000 barrel tank.

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1910.93a—ASBESTOS

(a) Definitions.

For the purpose of this section.

(1) "Asbestos" includes chrysotile, amosite, or 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 (c) 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 (c) 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 (c) 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

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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, 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 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. 6242 Mar. 25, 1972), and shall be used 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

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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 Standard Practices 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 § 1910.100.

(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-

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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 100-150 $\times$ (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 0.8 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 0.8 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 concentration 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 interval greater than 6 months for employee 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 limit 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

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at all approaches to areas containing excessive concentrations of airborne asbestos fibers.

ily visible and legible. The label shall state:

CAUTION

Contains Asbestos Fibers
Avoid Creating Dust
Breathing Asbestos Dust May Cause
Serious Bodily Harm

(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 styles of a visibility at least equal to that specified in this subdivision.

Legend	Notation
Asbestos -----	1" Sans Serif, Gothic or Block.
Dust Hazard -----	¾" Sans Serif, Gothic or Block.
Avoid Breathing Dust -----	¾" Gothic.
Wear Assigned Protective Equipment -----	¾" Gothic.
Do Not Remain In Area Unless Your Work Requires It. -----	¾" 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, and other products containing asbestos fibers, or to their containers, except that no label is required where asbestos fibers have been modified 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

(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

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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.

(i) **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 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}).

(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.

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