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ASBESTOS MANUAL

Pltf Exh

372

Firestone

December 5, 1979

TO: U.S. AND CANADIAN
PLANT SAFETY ENGINEERS

ASBESTOS MANUAL

Please find attached a copy of the Corporate Asbestos Manual which was compiled jointly by Environmental Engineering, Physical Distribution, and Industrial Hygiene. The purpose of this manual is to assist the plants in complying with applicable EPA, OSHA, and DOT regulations.

If you have any questions regarding the manual, please contact the following:

1. For OSHA regulations: T. Georgiadis, ext. 6405
2. For EPA regulations: A. H. King, ext. 7924
3. For DOT regulations: R. G. Schmitt, ext. 7121

Very truly yours,

Theodore Georgiadis

T. Georgiadis
Corporate Industrial Hygienist

TG:jk
Att.

cc: Dr. L. H. Ballou
Messrs. A. H. King
R. G. Schmitt
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R. L. Swenson
R. M. Walter

BATO/JACKSON 049607

TO ALL HM CONTACTS

Firestone INTEROFFICE

FROM R. G. SCHMITT

DATE DECEMBER 4, 1979

REFERENCE

SUBJECT ASBESTOS MANUAL
File #140-211D

Attached you will find a copy of a recently released Asbestos Manual. This manual is intended to provide you with a single document which contains information on all regulatory requirements pertaining to Asbestos.

Since other copies of the manual are being mailed to Safety Supervisors and EPA Coordinators, this copy should be retained/passed on to the HM Coordinator.

Your comments concerning the desirability of manuals like this would be appreciated.

R G Schmitt

R. G. SCHMITT
Physical Distribution

RGS:sr
Attachment

S1272A

ASBESTOS MANUAL

November 9, 1979

The Firestone Tire & Rubber Company

CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

INTRODUCTION

Asbestos and materials containing asbestos are now regulated by several federal regulatory agencies. The purpose of this manual is to compile in one document all applicable federal regulations and assist and guide the plants in complying with these regulations.

The use of asbestos or materials containing asbestos in our plants is now very limited. According to the information that we have available, asbestos insulation may still be used or found in the following areas:

Tire Plants

1. Curing area.
   a. Old pipe insulation.
   b. Curing press heat shields.
   c. Board type asbestos insulation between press platens or domes and in the curing press frame. This asbestos material is cut or machined by the McNeil Company or NRM and is only installed by Firestone people.
   d. Pipe insulation installed by McNeil or NRM on new presses that are shipped to Firestone plants.
   e. NRM well insulation.
2. Powerhouse - Plants ten years old or older.
   a. Pipe insulation.
   b. Deaerator heater.
3. Maintenance.
   a. Gaskets made from a material containing asbestos.
   b. Welding blankets or guards.
4. Tire building - Hot knife boxes.
   a. 99R3 TAM - Asbestos tubing 1.5" o.d. - 1.25" i.d. x 1" long, two per machine. This tubing insulates the heated magnets from the rest of the assembly.

      Asbestos tape 0.5" wide x 15" long, four per machine. This tape is wrapped around the heating elements and tubing described above.

b. All Radial First Stage TAM's. Radial sidewall knife - Heat sink hot box. Manganese-nickel wire with asbestos-glass insulation AWG 14, 16" required per machine.

All Other Plants

1. Gaskets made from a material containing asbestos that are cut to size and drilled to open holes.

2. Experimental formulation of small batches of rubber products containing asbestos. This is done in an Akron laboratory of the Synthetic Rubber Division.

Maintenance operations in plants often require the removal or demolition of old asbestos insulation. The removal of asbestos insulation is of considerable importance from the standpoint of compliance with federal regulations since the potential of employee exposure to airborne asbestos fibers is usually higher than in other operations.

The manual is divided into three sections. The first section describes the OSHA standard on asbestos. The second section describes the EPA regulations on asbestos which are applicable to Firestone operations. The third section summarizes the current Department of Transportation regulations on asbestos.

I. OSHA REGULATION SECTION 1910.1001

The OSHA standard on asbestos is described in Section 1910.1001 of the OSHA standards book.

Permissible Average Exposure Limit and Ceiling Concentration

The present 8-hour time-weighted average permissible exposure limit is two (2) fibers, longer than 5 microns, per cubic centimeter of air.

The permissible ceiling exposure limit is ten (10) fibers, longer than 5 microns, per cubic centimeter of air, as determined over a period of 15 minutes.

Air Monitoring and Sampling Frequency

All operations where asbestos and materials containing asbestos are being used or old asbestos insulation is being removed, replaced, or repaired must be monitored by air sampling to determine employee exposure to airborne asbestos fibers.

Samples should be collected from within the breathing zone of the employees on membrane filters mounted in an open face filter holder (cassette). Samples should be taken for the determination of the 8-hour time-weighted average concentration and of the ceiling concentration of asbestos fibers.

Cassettes for collecting air samples for asbestos are provided to the plants by the Industrial Hygiene Department. After sampling, these cassettes are returned to Industrial Hygiene for analysis and calculation of the airborne concentration of asbestos fibers. Detailed instructions on how to collect air samples for asbestos have been sent to the plant safety engineers by the Industrial Hygiene Department.

After the initial determination, samples should be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees to asbestos fibers. In no case should the sampling be done at intervals greater than 6 months for employees whose exposure to asbestos exceeds the permissible exposure limit or the permissible ceiling concentration.

Affected employees, or their representatives, should be given an opportunity to observe the monitoring operation.

Employee Notification and Recordkeeping of Exposure Results

Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the permissible exposure limit or the permissible ceiling concentration must be notified in writing of the exposure as soon as practicable but not later than 5 days of the finding. The employee must also be timely notified of the corrective action taken to reduce the airborne concentration of asbestos fibers.

Every employer must maintain records of any personal or environmental monitoring required by Section 1910.1001. Records must be maintained for a period of at least 20 years and must be made available upon request to the Assistant Secretary of Labor for OSHA, the Director of NIOSH, and to their authorized representatives.

Every employee and former employee shall have reasonable access to any records required to be maintained by this standard, which indicate the employee's own exposure to asbestos fibers.

Methods of Compliance

1. Particular Tools

   All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits listed above, such as saws, scorers, abrasive wheels, and drills, must be provided with local exhaust ventilation systems.

2. Wet Methods

   Insofar as practicable, asbestos must 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 permissible exposure limits, unless the usefulness of the product would be diminished by wetting it.

Spraying, Demolition, or Removal of Asbestos Insulation

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 must be provided with respiratory protective equipment and special clothing as described below.

Respiratory Protective Equipment

1. Air Purifying respirators

A reusable or single use (disposable) air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 2 but not greater than 20 fibers per cubic centimeter of air.

2. Powered Air Purifying Respirator

A powered air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 20 but not greater than 200 fibers per cubic centimeter of air.

3. Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type

A type C continuous flow or pressure-demand supplied-air respirator must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 200 fibers per cubic centimeter of air.

The OSHA standard specifies that employees engaged in the removal or demolition of asbestos insulation shall be provided with supplied-air respirators. For the removal of large sections of insulation which would normally last several days, a supplied-air respirator must be provided. As a general guideline, when the amount of asbestos to be removed is small and the operation will only last a few hours or less, a supplied-air respirator should still be provided if feasible. If this is not feasible, at least an air purifying respirator should be provided.

Special Clothing - Clothes Lockers - Laundering

The employer must 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 permissible exposure limits, or who is engaged in the removal or demolition of asbestos insulation.

At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the permissible exposure limits, the employer must provide change rooms for employees working regularly at the place.

The employer must 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.

Laundering of asbestos contaminated clothing must be done so as to prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Any employer who gives asbestos contaminated clothing to another person for laundering must inform such person of the requirement to effectively prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Contaminated clothing must be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with paragraph (g)(2)(ii) of the standard.

It is now common practice among employers to provide their employees who are engaged in asbestos insulation removal with disposable coveralls, head coverings and shoe coverings. The use of disposable protective clothing eliminates the necessity of laundering work clothes contaminated with asbestos and all other problems associated with it.

Caution Signs and Caution Labels

Caution signs must be provided and displayed at each location where airborne concentrations of asbestos fibers may exceed the permissible exposure limits. Signs must 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 must be posted at all approaches to areas containing excessive concentrations of asbestos fibers.

The signs must display a legend which is described in paragraph (g)(1)(ii) of this standard.

Since during the short time needed for a demolition or removal of asbestos insulation it is not usually possible to determine if the concentration of airborne fibers is above or below the permissible exposure limits, caution signs should be posted at all asbestos removal operations. These signs should be removed after the work is completed.

Caution labels must 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 no airborne concentrations of asbestos fibers in excess of the permissible exposure limits will be released.

The statement that is required on the label is described in paragraph (g)(2)(ii) of this standard.

Housekeeping - Waste Disposal

All external surfaces in any place of employment must be maintained free of accumulations of asbestos fibers. Collection of settled dust or debris should be done by vacuum cleaning. Do not clean up asbestos by blowing or dry sweeping.

Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, that is to be disposed of, must be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

The federal regulations pertaining to asbestos waste disposal practices and procedures are described in the next section of the manual under US-EPA Regulations.

Medical Examinations

The standard requires that the employer provide or make available at his cost medical examinations to each of his employees exposed to asbestos fibers. The medical examinations program required by OSHA is presented below (this is a copy of the medical surveillance program for asbestos which has been adopted by the Corporate Medical Department).

ASBESTOS

A. Reason for medical surveillance

   1. Required by the OSHA asbestos standard (29 CFR 1910.1001 (j))

B. Forms of asbestos included

   1. Chrysotile
   2. Amosite

3. Crocidolite
4. Tremolite
5. Anthophyllite
6. Actinolite

C. Level of exposure

1. Airborne exposure to asbestos at or above 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

Note: This definition of exposure has been established by OSHA Program Directive 300-16, effective October 11, 1978, and will not be found in the original OSHA asbestos standard.

D. Types of medical tests and procedures

1. Detailed work and medical history with particular attention to

a. Respiratory and cardiopulmonary disorders
b. Smoking habits

2. Comprehensive physical examination with particular attention to respiratory and cardiovascular systems

3. Chest x-rays - PA on 14" x 17" plate (a lateral x-ray is also strongly recommended)

4. Pulmonary function tests - FEV_1 and FVC

E. Frequency of medical tests and procedures

1. All tests and procedures

a. Prior to or within 30 days after placement in an exposure area where airborne asbestos levels exceed 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

b. At least annually while working in the exposure area

c. Within 30 days before or after termination of employment in an exposure area unless all the tests and procedures have been performed within the past year

F. Interpretation of medical tests and procedures

1. Chest x-rays should be interpreted by a radiologist

2. In order to unify and standardize the pulmonary function tests, the actual administration of the tests should be done by as few people as possible. The original tracing and interpretation should be given to the plant physician for medical management. A copy of each should be sent to the Corporate Medical Department for short and long term interpretation, study, and storage.

3. Whenever an employee shows signs or symptoms of chronic non-malignant or malignant lung disease or cardiopulmonary disorders which may be due to occupational exposure to asbestos, the Corporate Medical Department should be consulted.

4. Any abnormality in the chest x-rays as compared to established norms or earlier findings, a definite reduction in the FEV_1 or FVC, or degeneration of the employee's general respiratory condition should be reasons for not employing or for removing the employee from the asbestos exposure area.

5. The responsibility for medical removal and reinstatement is that of the plant physician in consultation with as many other physicians as he deems necessary.

6. Medical records of employees examined under this protocol, including examination and test results, written medical opinions, and records of employee complaints, should be retained for at least five years after the last employment for each employee, or for twenty years from the date of the record, whichever is longer.

II. US-EPA REGULATION

Introduction

The US-EPA has established emission standards for certain hazardous air pollutants under its National Emission Standards for Hazardous Air Pollutants Regulations (NESHAPS). Asbestos is included as one of the four substances currently regulated under these regulations (40 CFR Part 61, Subpart B).

The NESHAPS regulations are applicable to the following operations:

a) asbestos mills
b) roadways
c) manufacturing
d) demolition and renovation
e) spraying
f) fabricating
g) insulating
h) waste disposal

Based upon Environmental Engineering's knowledge, Firestone is mainly involved in Items (d) and (h) above.

US-EPA intentions are to administer these regulations on a state by state basis by delegating authority to the individual state air control agencies (i.e., once they have met all the necessary requirements). To date, 31 states have been given this authority as follows: Alabama, Arizona, California, Colorado, Connecticut, Delaware, Georgia, Indiana, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, Texas, Vermont, Virginia, Washington, Wisconsin, Puerto Rico, and U. S. Virgin Islands.

These regulations (i.e., NESHAPS) for controlling asbestos emissions were first promulgated on April 6, 1973 (38 FR 8820) in fulfilling requirements under Section 112 (B) of the Clean Air Act, as amended December 1970. Since then they have undergone various revisions, the most recent of which was promulgated February 7, 1979, giving the State of Texas authority to administer the NESHAPS program and issue permits, etc. in the state.

From time to time additional pollutants which are found to be hazardous[1] will be included under EPA NESHAPS regulations (i.e., vinyl chloride was added to the original list on October 21, 1976, 41 FR 46560).

[1]May cause, or contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness - Clean Air Act, Section 112(1), December 1970.

Reason for Control of Asbestos Emissions

A large number of studies have shown an association between occupational exposure to asbestos and a higher than expected incidence of bronchial cancer. Asbestos also has been identified as a causal factor in the development of cancers of the membranes of the chest and abdomen.

Emission Standard for Asbestos

Basically the regulations prohibit any discharge of asbestos to the outside air which creates a visible emission which may be detected without the aid of instruments. By definition, outside air means the air outside buildings or structures.

A source can use a specified method of air cleaning (fabric filter systems, etc.) to eliminate such emissions, provided that the emission control equipment is approved by the administrator of the US-EPA or his authorized representative.

Specifically the asbestos standards are:

1. There shall be no visible emissions to the outside air from any asbestos mill, except when a specified method of air cleaning, also part of these standards, is used before the emissions escape to the outside air. In general, these air-cleaning systems filter asbestos emissions to the point that visible emissions would not be produced anyway.

2. The surfacing of roadways with asbestos tailings is prohibited, except for temporary roadways in an area of asbestos ore deposits.

3. There shall be no visible emissions to the outside air, unless the specified air cleaning methods are used, from any operation which manufacturers: cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, other textile products, cement products, fireproofing and insulating materials, friction products, paper, millboard, felt, floor tile, paints, coatings, caulks, adhesives, sealants, plastics and rubber materials, and chlorine.

4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

c. No asbestos debris shall be dropped or thrown to the ground or from one floor to another. For buildings 50 feet or greater in height, asbestos debris shall be lowered to the ground via dust-tight chutes or containers.

d. Written notice of intention to demolish shall be provided to the US-EPA Regional Administrator at least 10 days prior to commencement of demolition. This notice shall include items under Section 61.22(d)(2) of this regulation.

e. Certain demolition operations are exempt from the regulations, except for the wetting of asbestos debris and the notification requirement, if a building has been declared to be structurally unsound and in danger of imminent collapse.

f. Asbestos waste shall be sealed in leak-tight containers while wet, prior to being sent to an approved waste disposal site.

g. The leak-tight containers (Item f) should be labeled with a warning label which reads:

CAUTION

Contains Asbestos

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

h. The owner or operator of a demolition operation is exempted from these requirements, with the exception of Item d above, provided the amount of friable asbestos materials in the building or portion thereof to be demolished is less than 80 meters (ca. 260 feet) used on pipes, and less than 15 square meters (ca. 160 square feet) used on any duct, boiler, tank, reactor, turbine, furnace, or structural member.

These regulations also set forth collection, processing, and disposal requirements which the waste disposal firm must adhere to in handling and disposing of this waste (40 CFR 61.25). Since Firestone in most cases, if not all, will be utilizing outside firms for disposal of its asbestos wastes, no further

discussion of these requirements will be presented herein. Firestone, however, must verify that any firm selected to dispose of its asbestos waste will meet the requirements of paragraph 61.25 (i.e., approved operation).

Following is Section 61.22(d)(2) of the Emission standard:

> Written notice of intention to demolish or renovate shall be provided to the Administrator by the owner or operator of the demolition or renovation operation. Such notice shall be postmarked or delivered to the Administrator at least 10 days prior to commencement of demolition, or as early as possible prior to commencement of emergency demolition subject to paragraph (d)(6) of this section, and as early as possible prior to commencement of renovation. Such notice shall include the following information:
>
> (i) Name of owner or operator.
>
> (ii) Address of owner or operator.
>
> (iii) Description of the building, structure, facility, or installation to be demolished or renovated, including the size, age, and prior use of the structure, and the approximate amount of friable asbestos materials present.
>
> (iv) Address or location of the building, structure, facility, or installation.
>
> (v) Scheduled starting and completion dates of demolition or renovation.
>
> (vi) Nature of planned demolition or renovation and method(s) to be employed.
>
> (vii) Procedures to be employed to meet the requirements of this paragraph and paragraph (j) of this section.
>
> (viii) The name and address or location of the waste disposal site where the friable asbestos waste will be deposited.
>
> (ix) Name, title, and authority of the State or local governmental representative who has ordered a demolition which is subject to paragraph (d)(6) of this section.

III. DEPARTMENT OF TRANSPORTATION REGULATIONS

The Department of Transportation (DOT) currently regulates only the transportation of commercial asbestos. They do not regulate:

1. Asbestos which has no commercial value, such as products which contain trace amounts as a contaminant (49 CFR 173.1090(c)).

2. Waste asbestos which is currently proposed to be regulated under DOT hazardous waste regulations (preamble to final commercial asbestos rule issued December 4, 1978).

3. Asbestos which is immersed or fixed in a natural or artificial binder material such as cement, plastic, asphalt, resin, or mineral ore (49 CFR 173.1090(c)).

DOT does regulate commercial asbestos which is defined as any material or product which has commercial value because of its asbestos content (49 CFR 173.1090(a)).

When regulated, DOT requires that shipments of asbestos meet the following requirements:

1. Packaging must be as specified in 49 CFR 173.1090(d):

   a. Leak-tight packages such as metal or fiber drums.

   b. Bags which are dust and sift proof and are unitized on a pallet. Pallet loads should be encased in a shrink wrapped plastic film or fiberboard secured by strapping.

   c. Bags placed inside wooden or fiberboard boxes.

2. Each outside package must be marked with the word "Asbestos" and the name and address of the consignee or consignor (49 CFR 173.304 and 173.306).

3. Each outside container must be marked "ORM-C" in an appropriate rectangle (49 CFR 172.316). Labels which can be used for this purpose are available through normal Firestone stationery store channels. The form number and description for ordering purposes is "S-8974, ORM-C Label".

4. Asbestos shipped via the water or air mode must also meet the following shipping paper requirements (49 CFR 172.200):

a. The total amount of commercial asbestos being shipped, i.e., the net weight of the product containing commercial asbestos (49 CFR 172.202).

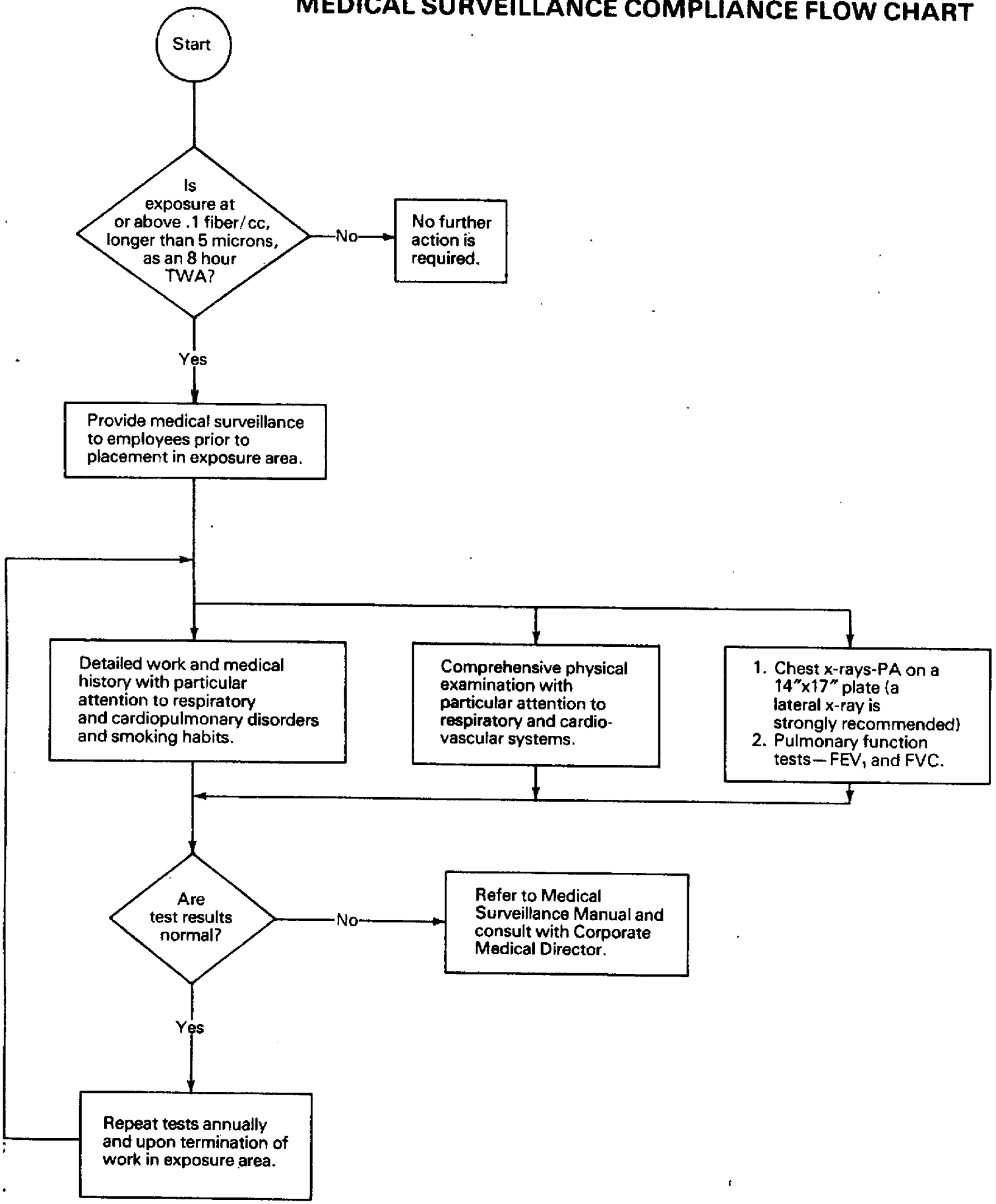
b. The proper shipping name and hazard class, i.e., Asbestos ORM-C (49 CFR 172.202).

c. If shipped on the same bill of lading with non-hazardous materials, the asbestos entry should be before any non-hazardous entries or in a contrasting color (highlighted)(49 CFR 172.201).

d. A signed certification (49 CFR 172.204).

There are no shipping paper requirements when commercial asbestos is shipped via truck or rail modes (49 CFR 172.200).

FEDERAL ASBESTOS STANDARD
MEDICAL SURVEILLANCE COMPLIANCE FLOW CHART



SEE ATTACHED FOR MAILING LIST

Firestone

December 5, 1979

TO: U.S. AND CANADIAN
PLANT SAFETY ENGINEERS

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Very truly yours,

Theodore Georgiadis

T. Georgiadis
Corporate Industrial Hygienist

TG:jk
Att.

cc: Dr. L. H. Ballou
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November 9, 1979

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CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

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CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

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Asbestos and materials containing asbestos are now regulated by several federal regulatory agencies. The purpose of this manual is to compile in one document all applicable federal regulations and assist and guide the plants in complying with these regulations.

The use of asbestos or materials containing asbestos in our plants is now very limited. According to the information that we have available, asbestos insulation may still be used or found in the following areas:

Tire Plants

1. Curing area.
   a. Old pipe insulation.
   b. Curing press heat shields.
   c. Board type asbestos insulation between press platens or domes and in the curing press frame. This asbestos material is cut or machined by the McNeil Company or NRM and is only installed by Firestone people.
   d. Pipe insulation installed by McNeil or NRM on new presses that are shipped to Firestone plants.
   e. NRM well insulation.
2. Powerhouse - Plants ten years old or older.
   a. Pipe insulation.
   b. Deaerator heater.
3. Maintenance.
   a. Gaskets made from a material containing asbestos.
   b. Welding blankets or guards.
4. Tire building - Hot knife boxes.
   a. 99R3 TAM - Asbestos tubing 1.5" o.d. - 1.25" i.d. x 1" long, two per machine. This tubing insulates the heated magnets from the rest of the assembly.

      Asbestos tape 0.5" wide x 15" long, four per machine. This tape is wrapped around the heating elements and tubing described above.

b. All Radial First Stage TAM's. Radial sidewall knife - Heat sink hot box. Manganese-nickel wire with asbestos-glass insulation AWG 14, 16" required per machine.

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1. Gaskets made from a material containing asbestos that are cut to size and drilled to open holes.

2. Experimental formulation of small batches of rubber products containing asbestos. This is done in an Akron laboratory of the Synthetic Rubber Division.

Maintenance operations in plants often require the removal or demolition of old asbestos insulation. The removal of asbestos insulation is of considerable importance from the standpoint of compliance with federal regulations since the potential of employee exposure to airborne asbestos fibers is usually higher than in other operations.

The manual is divided into three sections. The first section describes the OSHA standard on asbestos. The second section describes the EPA regulations on asbestos which are applicable to Firestone operations. The third section summarizes the current Department of Transportation regulations on asbestos.

I. OSHA REGULATION SECTION 1910.1001

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The present 8-hour time-weighted average permissible exposure limit is two (2) fibers, longer than 5 microns, per cubic centimeter of air.

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All operations where asbestos and materials containing asbestos are being used or old asbestos insulation is being removed, replaced, or repaired must be monitored by air sampling to determine employee exposure to airborne asbestos fibers.

Samples should be collected from within the breathing zone of the employees on membrane filters mounted in an open face filter holder (cassette). Samples should be taken for the determination of the 8-hour time-weighted average concentration and of the ceiling concentration of asbestos fibers.

Cassettes for collecting air samples for asbestos are provided to the plants by the Industrial Hygiene Department. After sampling, these cassettes are returned to Industrial Hygiene for analysis and calculation of the airborne concentration of asbestos fibers. Detailed instructions on how to collect air samples for asbestos have been sent to the plant safety engineers by the Industrial Hygiene Department.

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Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the permissible exposure limit or the permissible ceiling concentration must be notified in writing of the exposure as soon as practicable but not later than 5 days of the finding. The employee must also be timely notified of the corrective action taken to reduce the airborne concentration of asbestos fibers.

Every employer must maintain records of any personal or environmental monitoring required by Section 1910.1001. Records must be maintained for a period of at least 20 years and must be made available upon request to the Assistant Secretary of Labor for OSHA, the Director of NIOSH, and to their authorized representatives.

Every employee and former employee shall have reasonable access to any records required to be maintained by this standard, which indicate the employee's own exposure to asbestos fibers.

Methods of Compliance

1. Particular Tools

   All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits listed above, such as saws, scorers, abrasive wheels, and drills, must be provided with local exhaust ventilation systems.

2. Wet Methods

   Insofar as practicable, asbestos must 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 permissible exposure limits, unless the usefulness of the product would be diminished by wetting it.

Spraying, Demolition, or Removal of Asbestos Insulation

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 must be provided with respiratory protective equipment and special clothing as described below.

Respiratory Protective Equipment

1. Air Purifying respirators

A reusable or single use (disposable) air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 2 but not greater than 20 fibers per cubic centimeter of air.

2. Powered Air Purifying Respirator

A powered air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 20 but not greater than 200 fibers per cubic centimeter of air.

3. Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type

A type C continuous flow or pressure-demand supplied-air respirator must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 200 fibers per cubic centimeter of air.

The OSHA standard specifies that employees engaged in the removal or demolition of asbestos insulation shall be provided with supplied-air respirators. For the removal of large sections of insulation which would normally last several days, a supplied-air respirator must be provided. As a general guideline, when the amount of asbestos to be removed is small and the operation will only last a few hours or less, a supplied-air respirator should still be provided if feasible. If this is not feasible, at least an air purifying respirator should be provided.

Special Clothing - Clothes Lockers - Laundering

The employer must 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 permissible exposure limits, or who is engaged in the removal or demolition of asbestos insulation.

At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the permissible exposure limits, the employer must provide change rooms for employees working regularly at the place.

The employer must 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.

Laundering of asbestos contaminated clothing must be done so as to prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Any employer who gives asbestos contaminated clothing to another person for laundering must inform such person of the requirement to effectively prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Contaminated clothing must be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with paragraph (g)(2)(ii) of the standard.

It is now common practice among employers to provide their employees who are engaged in asbestos insulation removal with disposable coveralls, head coverings and shoe coverings. The use of disposable protective clothing eliminates the necessity of laundering work clothes contaminated with asbestos and all other problems associated with it.

Caution Signs and Caution Labels

Caution signs must be provided and displayed at each location where airborne concentrations of asbestos fibers may exceed the permissible exposure limits. Signs must 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 must be posted at all approaches to areas containing excessive concentrations of asbestos fibers.

The signs must display a legend which is described in paragraph (g)(1)(ii) of this standard.

Since during the short time needed for a demolition or removal of asbestos insulation it is not usually possible to determine if the concentration of airborne fibers is above or below the permissible exposure limits, caution signs should be posted at all asbestos removal operations. These signs should be removed after the work is completed.

Caution labels must 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 no airborne concentrations of asbestos fibers in excess of the permissible exposure limits will be released.

The statement that is required on the label is described in paragraph (g)(2)(ii) of this standard.

Housekeeping - Waste Disposal

All external surfaces in any place of employment must be maintained free of accumulations of asbestos fibers. Collection of settled dust or debris should be done by vacuum cleaning. Do not clean up asbestos by blowing or dry sweeping.

Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, that is to be disposed of, must be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

The federal regulations pertaining to asbestos waste disposal practices and procedures are described in the next section of the manual under US-EPA Regulations.

Medical Examinations

The standard requires that the employer provide or make available at his cost medical examinations to each of his employees exposed to asbestos fibers. The medical examinations program required by OSHA is presented below (this is a copy of the medical surveillance program for asbestos which has been adopted by the Corporate Medical Department).

ASBESTOS

A. Reason for medical surveillance

   1. Required by the OSHA asbestos standard (29 CFR 1910.1001(j))

B. Forms of asbestos included

   1. Chrysotile
   2. Amosite

3. Crocidolite
4. Tremolite
5. Anthophyllite
6. Actinolite

C. Level of exposure

1. Airborne exposure to asbestos at or above 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

Note: This definition of exposure has been established by OSHA Program Directive 300-16, effective October 11, 1978, and will not be found in the original OSHA asbestos standard.

D. Types of medical tests and procedures

1. Detailed work and medical history with particular attention to

a. Respiratory and cardiopulmonary disorders
b. Smoking habits

2. Comprehensive physical examination with particular attention to respiratory and cardiovascular systems

3. Chest x-rays - PA on 14" x 17" plate (a lateral x-ray is also strongly recommended)

4. Pulmonary function tests - FEV_1 and FVC

E. Frequency of medical tests and procedures

1. All tests and procedures

a. Prior to or within 30 days after placement in an exposure area where airborne asbestos levels exceed 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

b. At least annually while working in the exposure area

c. Within 30 days before or after termination of employment in an exposure area unless all the tests and procedures have been performed within the past year

F. Interpretation of medical tests and procedures

1. Chest x-rays should be interpreted by a radiologist

2. In order to unify and standardize the pulmonary function tests, the actual administration of the tests should be done by as few people as possible. The original tracing and interpretation should be given to the plant physician for medical management. A copy of each should be sent to the Corporate Medical Department for short and long term interpretation, study, and storage.

3. Whenever an employee shows signs or symptoms of chronic non-malignant or malignant lung disease or cardiopulmonary disorders which may be due to occupational exposure to asbestos, the Corporate Medical Department should be consulted.

4. Any abnormality in the chest x-rays as compared to established norms or earlier findings, a definite reduction in the FEV_1 or FVC, or degeneration of the employee's general respiratory condition should be reasons for not employing or for removing the employee from the asbestos exposure area.

5. The responsibility for medical removal and reinstatement is that of the plant physician in consultation with as many other physicians as he deems necessary.

6. Medical records of employees examined under this protocol, including examination and test results, written medical opinions, and records of employee complaints, should be retained for at least five years after the last employment for each employee, or for twenty years from the date of the record, whichever is longer.

II. US-EPA REGULATION

Introduction

The US-EPA has established emission standards for certain hazardous air pollutants under its National Emission Standards for Hazardous Air Pollutants Regulations (NESHAPS). Asbestos is included as one of the four substances currently regulated under these regulations (40 CFR Part 61, Subpart B).

The NESHAPS regulations are applicable to the following operations:

a) asbestos mills
b) roadways
c) manufacturing
d) demolition and renovation
e) spraying
f) fabricating
g) insulating
h) waste disposal

Based upon Environmental Engineering's knowledge, Firestone is mainly involved in Items (d) and (h) above.

US-EPA intentions are to administer these regulations on a state by state basis by delegating authority to the individual state air control agencies (i.e., once they have met all the necessary requirements). To date, 31 states have been given this authority as follows: Alabama, Arizona, California, Colorado, Connecticut, Delaware, Georgia, Indiana, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, Texas, Vermont, Virginia, Washington, Wisconsin, Puerto Rico, and U. S. Virgin Islands.

These regulations (i.e., NESHAPS) for controlling asbestos emissions were first promulgated on April 6, 1973 (38 FR 8820) in fulfilling requirements under Section 112 (B) of the Clean Air Act, as amended December 1970. Since then they have undergone various revisions, the most recent of which was promulgated February 7, 1979, giving the State of Texas authority to administer the NESHAPS program and issue permits, etc. in the state.

From time to time additional pollutants which are found to be hazardous[1] will be included under EPA NESHAPS regulations (i.e., vinyl chloride was added to the original list on October 21, 1976, 41 FR 46560).

[1]May cause, or contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness - Clean Air Act, Section 112(1), December 1970.

Reason for Control of Asbestos Emissions

A large number of studies have shown an association between occupational exposure to asbestos and a higher than expected incidence of bronchial cancer. Asbestos also has been identified as a causal factor in the development of cancers of the membranes of the chest and abdomen.

Emission Standard for Asbestos

Basically the regulations prohibit any discharge of asbestos to the outside air which creates a visible emission which may be detected without the aid of instruments. By definition, outside air means the air outside buildings or structures.

A source can use a specified method of air cleaning (fabric filter systems, etc.) to eliminate such emissions, provided that the emission control equipment is approved by the administrator of the US-EPA or his authorized representative.

Specifically the asbestos standards are:

1. There shall be no visible emissions to the outside air from any asbestos mill, except when a specified method of air cleaning, also part of these standards, is used before the emissions escape to the outside air. In general, these air-cleaning systems filter asbestos emissions to the point that visible emissions would not be produced anyway.

2. The surfacing of roadways with asbestos tailings is prohibited, except for temporary roadways in an area of asbestos ore deposits.

3. There shall be no visible emissions to the outside air, unless the specified air cleaning methods are used, from any operation which manufacturers: cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, other textile products, cement products, fireproofing and insulating materials, friction products, paper, millboard, felt, floor tile, paints, coatings, caulks, adhesives, sealants, plastics and rubber materials, and chlorine.

4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

c. No asbestos debris shall be dropped or thrown to the ground or from one floor to another. For buildings 50 feet or greater in height, asbestos debris shall be lowered to the ground via dust-tight chutes or containers.

d. Written notice of intention to demolish shall be provided to the US-EPA Regional Administrator at least 10 days prior to commencement of demolition. This notice shall include items under Section 61.22(d)(2) of this regulation.

e. Certain demolition operations are exempt from the regulations, except for the wetting of asbestos debris and the notification requirement, if a building has been declared to be structurally unsound and in danger of imminent collapse.

f. Asbestos waste shall be sealed in leak-tight containers while wet, prior to being sent to an approved waste disposal site.

g. The leak-tight containers (Item f) should be labeled with a warning label which reads:

CAUTION

Contains Asbestos

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

h. The owner or operator of a demolition operation is exempted from these requirements, with the exception of Item d above, provided the amount of friable asbestos materials in the building or portion thereof to be demolished is less than 80 meters (ca. 260 feet) used on pipes, and less than 15 square meters (ca. 160 square feet) used on any duct, boiler, tank, reactor, turbine, furnace, or structural member.

These regulations also set forth collection, processing, and disposal requirements which the waste disposal firm must adhere to in handling and disposing of this waste (40 CFR 61.25). Since Firestone in most cases, if not all, will be utilizing outside firms for disposal of its asbestos wastes, no further

discussion of these requirements will be presented herein. Firestone, however, must verify that any firm selected to dispose of its asbestos waste will meet the requirements of paragraph 61.25 (i.e., approved operation).

Following is Section 61.22(d)(2) of the Emission standard:

> Written notice of intention to demolish or renovate shall be provided to the Administrator by the owner or operator of the demolition or renovation operation. Such notice shall be postmarked or delivered to the Administrator at least 10 days prior to commencement of demolition, or as early as possible prior to commencement of emergency demolition subject to paragraph (d)(6) of this section, and as early as possible prior to commencement of renovation. Such notice shall include the following information:
>
> (i) Name of owner or operator.
>
> (ii) Address of owner or operator.
>
> (iii) Description of the building, structure, facility, or installation to be demolished or renovated, including the size, age, and prior use of the structure, and the approximate amount of friable asbestos materials present.
>
> (iv) Address or location of the building, structure, facility, or installation.
>
> (v) Scheduled starting and completion dates of demolition or renovation.
>
> (vi) Nature of planned demolition or renovation and method(s) to be employed.
>
> (vii) Procedures to be employed to meet the requirements of this paragraph and paragraph (j) of this section.
>
> (viii) The name and address or location of the waste disposal site where the friable asbestos waste will be deposited.
>
> (ix) Name, title, and authority of the State or local governmental representative who has ordered a demolition which is subject to paragraph (d)(6) of this section.

III. DEPARTMENT OF TRANSPORTATION REGULATIONS

The Department of Transportation (DOT) currently regulates only the transportation of commercial asbestos. They do not regulate:

1. Asbestos which has no commercial value, such as products which contain trace amounts as a contaminant (49 CFR 173.1090(c)).

2. Waste asbestos which is currently proposed to be regulated under DOT hazardous waste regulations (preamble to final commercial asbestos rule issued December 4, 1978).

3. Asbestos which is immersed or fixed in a natural or artificial binder material such as cement, plastic, asphalt, resin, or mineral ore (49 CFR 173.1090(c)).

DOT does regulate commercial asbestos which is defined as any material or product which has commercial value because of its asbestos content (49 CFR 173.1090(a)).

When regulated, DOT requires that shipments of asbestos meet the following requirements:

1. Packaging must be as specified in 49 CFR 173.1090(d):

   a. Leak-tight packages such as metal or fiber drums.

   b. Bags which are dust and sift proof and are unitized on a pallet. Pallet loads should be encased in a shrink wrapped plastic film or fiberboard secured by strapping.

   c. Bags placed inside wooden or fiberboard boxes.

2. Each outside package must be marked with the word "Asbestos" and the name and address of the consignee or consignor (49 CFR 173.304 and 173.306).

3. Each outside container must be marked "ORM-C" in an appropriate rectangle (49 CFR 172.316). Labels which can be used for this purpose are available through normal Firestone stationery store channels. The form number and description for ordering purposes is "S-8974, ORM-C Label".

4. Asbestos shipped via the water or air mode must also meet the following shipping paper requirements (49 CFR 172.200):

a. The total amount of commercial asbestos being shipped, i.e., the net weight of the product containing commercial asbestos (49 CFR 172.202).

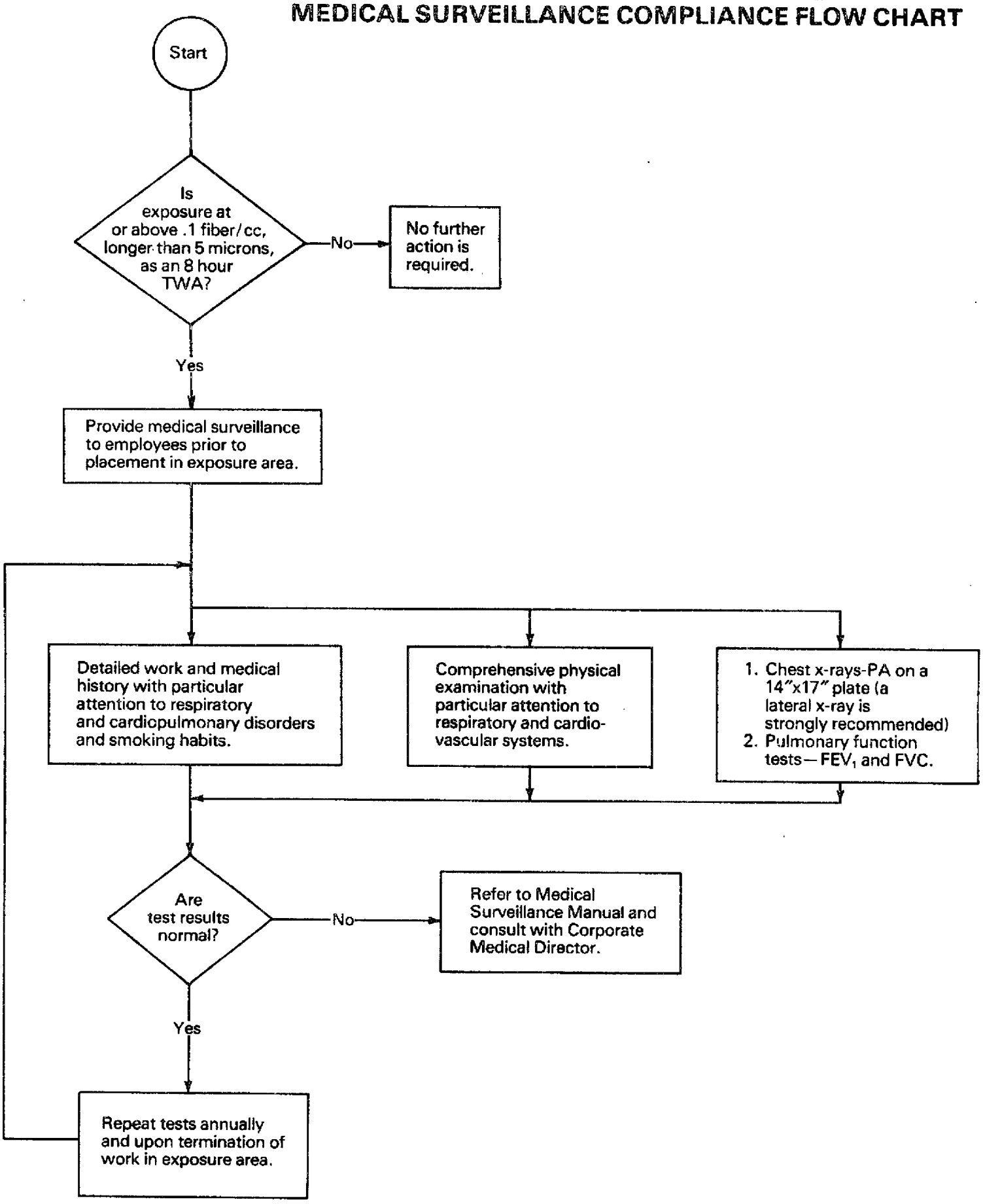
b. The proper shipping name and hazard class, i.e., Asbestos ORM-C (49 CFR 172.202).

c. If shipped on the same bill of lading with non-hazardous materials, the asbestos entry should be before any non-hazardous entries or in a contrasting color (highlighted)(49 CFR 172.201).

d. A signed certification (49 CFR 172.204).

There are no shipping paper requirements when commercial asbestos is shipped via truck or rail modes (49 CFR 172.200).

FEDERAL ASBESTOS STANDARD
MEDICAL SURVEILLANCE COMPLIANCE FLOW CHART



ASBESTOS MANUAL

November 9, 1979

The Firestone Tire & Rubber Company

CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

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CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

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The signs must display a legend which is described in paragraph (g)(1)(ii) of this standard.

Since during the short time needed for a demolition or removal of asbestos insulation it is not usually possible to determine if the concentration of airborne fibers is above or below the permissible exposure limits, caution signs should be posted at all asbestos removal operations. These signs should be removed after the work is completed.

Caution labels must 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 no airborne concentrations of asbestos fibers in excess of the permissible exposure limits will be released.

The statement that is required on the label is described in paragraph (g)(2)(ii) of this standard.

Housekeeping - Waste Disposal

All external surfaces in any place of employment must be maintained free of accumulations of asbestos fibers. Collection of settled dust or debris should be done by vacuum cleaning. Do not clean up asbestos by blowing or dry sweeping.

Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, that is to be disposed of, must be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

The federal regulations pertaining to asbestos waste disposal practices and procedures are described in the next section of the manual under US-EPA Regulations.

Medical Examinations

The standard requires that the employer provide or make available at his cost medical examinations to each of his employees exposed to asbestos fibers. The medical examinations program required by OSHA is presented below (this is a copy of the medical surveillance program for asbestos which has been adopted by the Corporate Medical Department).

ASBESTOS

A. Reason for medical surveillance

1. Required by the OSHA asbestos standard (29 CFR 1910.1001(j))

B. Forms of asbestos included

1. Chrysotile
2. Amosite

3. Crocidolite
4. Tremolite
5. Anthophyllite
6. Actinolite

C. Level of exposure

1. Airborne exposure to asbestos at or above 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

Note: This definition of exposure has been established by OSHA Program Directive 300-16, effective October 11, 1978, and will not be found in the original OSHA asbestos standard.

D. Types of medical tests and procedures

1. Detailed work and medical history with particular attention to

a. Respiratory and cardiopulmonary disorders
b. Smoking habits

2. Comprehensive physical examination with particular attention to respiratory and cardiovascular systems

3. Chest x-rays - PA on 14" x 17" plate (a lateral x-ray is also strongly recommended)

4. Pulmonary function tests - FEV_1 and FVC

E. Frequency of medical tests and procedures

1. All tests and procedures

a. Prior to or within 30 days after placement in an exposure area where airborne asbestos levels exceed 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

b. At least annually while working in the exposure area

c. Within 30 days before or after termination of employment in an exposure area unless all the tests and procedures have been performed within the past year

F. Interpretation of medical tests and procedures

1. Chest x-rays should be interpreted by a radiologist

2. In order to unify and standardize the pulmonary function tests, the actual administration of the tests should be done by as few people as possible. The original tracing and interpretation should be given to the plant physician for medical management. A copy of each should be sent to the Corporate Medical Department for short and long term interpretation, study, and storage.

3. Whenever an employee shows signs or symptoms of chronic non-malignant or malignant lung disease or cardiopulmonary disorders which may be due to occupational exposure to asbestos, the Corporate Medical Department should be consulted.

4. Any abnormality in the chest x-rays as compared to established norms or earlier findings, a definite reduction in the FEV_1 or FVC, or degeneration of the employee's general respiratory condition should be reasons for not employing or for removing the employee from the asbestos exposure area.

5. The responsibility for medical removal and reinstatement is that of the plant physician in consultation with as many other physicians as he deems necessary.

6. Medical records of employees examined under this protocol, including examination and test results, written medical opinions, and records of employee complaints, should be retained for at least five years after the last employment for each employee, or for twenty years from the date of the record, whichever is longer.

II. US-EPA REGULATION

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The US-EPA has established emission standards for certain hazardous air pollutants under its National Emission Standards for Hazardous Air Pollutants Regulations (NESHAPS). Asbestos is included as one of the four substances currently regulated under these regulations (40 CFR Part 61, Subpart B).

The NESHAPS regulations are applicable to the following operations:

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Based upon Environmental Engineering's knowledge, Firestone is mainly involved in Items (d) and (h) above.

US-EPA intentions are to administer these regulations on a state by state basis by delegating authority to the individual state air control agencies (i.e., once they have met all the necessary requirements). To date, 31 states have been given this authority as follows: Alabama, Arizona, California, Colorado, Connecticut, Delaware, Georgia, Indiana, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, Texas, Vermont, Virginia, Washington, Wisconsin, Puerto Rico, and U. S. Virgin Islands.

These regulations (i.e., NESHAPS) for controlling asbestos emissions were first promulgated on April 6, 1973 (38 FR 8820) in fulfilling requirements under Section 112 (B) of the Clean Air Act, as amended December 1970. Since then they have undergone various revisions, the most recent of which was promulgated February 7, 1979, giving the State of Texas authority to administer the NESHAPS program and issue permits, etc. in the state.

From time to time additional pollutants which are found to be hazardous[1] will be included under EPA NESHAPS regulations (i.e., vinyl chloride was added to the original list on October 21, 1976, 41 FR 46560).

[1]May cause, or contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness - Clean Air Act, Section 112(1), December 1970.

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Basically the regulations prohibit any discharge of asbestos to the outside air which creates a visible emission which may be detected without the aid of instruments. By definition, outside air means the air outside buildings or structures.

A source can use a specified method of air cleaning (fabric filter systems, etc.) to eliminate such emissions, provided that the emission control equipment is approved by the administrator of the US-EPA or his authorized representative.

Specifically the asbestos standards are:

1. There shall be no visible emissions to the outside air from any asbestos mill, except when a specified method of air cleaning, also part of these standards, is used before the emissions escape to the outside air. In general, these air-cleaning systems filter asbestos emissions to the point that visible emissions would not be produced anyway.

2. The surfacing of roadways with asbestos tailings is prohibited, except for temporary roadways in an area of asbestos ore deposits.

3. There shall be no visible emissions to the outside air, unless the specified air cleaning methods are used, from any operation which manufacturers: cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, other textile products, cement products, fireproofing and insulating materials, friction products, paper, millboard, felt, floor tile, paints, coatings, caulks, adhesives, sealants, plastics and rubber materials, and chlorine.

4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

c. No asbestos debris shall be dropped or thrown to the ground or from one floor to another. For buildings 50 feet or greater in height, asbestos debris shall be lowered to the ground via dust-tight chutes or containers.

d. Written notice of intention to demolish shall be provided to the US-EPA Regional Administrator at least 10 days prior to commencement of demolition. This notice shall include items under Section 61.22(d)(2) of this regulation.

e. Certain demolition operations are exempt from the regulations, except for the wetting of asbestos debris and the notification requirement, if a building has been declared to be structurally unsound and in danger of imminent collapse.

f. Asbestos waste shall be sealed in leak-tight containers while wet, prior to being sent to an approved waste disposal site.

g. The leak-tight containers (Item f) should be labeled with a warning label which reads:

CAUTION

Contains Asbestos

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

h. The owner or operator of a demolition operation is exempted from these requirements, with the exception of Item d above, provided the amount of friable asbestos materials in the building or portion thereof to be demolished is less than 80 meters (ca. 260 feet) used on pipes, and less than 15 square meters (ca. 160 square feet) used on any duct, boiler, tank, reactor, turbine, furnace, or structural member.

These regulations also set forth collection, processing, and disposal requirements which the waste disposal firm must adhere to in handling and disposing of this waste (40 CFR 61.25). Since Firestone in most cases, if not all, will be utilizing outside firms for disposal of its asbestos wastes, no further

discussion of these requirements will be presented herein. Firestone, however, must verify that any firm selected to dispose of its asbestos waste will meet the requirements of paragraph 61.25 (i.e., approved operation).

Following is Section 61.22(d)(2) of the Emission standard:

> Written notice of intention to demolish or renovate shall be provided to the Administrator by the owner or operator of the demolition or renovation operation. Such notice shall be postmarked or delivered to the Administrator at least 10 days prior to commencement of demolition, or as early as possible prior to commencement of emergency demolition subject to paragraph (d)(6) of this section, and as early as possible prior to commencement of renovation. Such notice shall include the following information:
>
> (i) Name of owner or operator.
>
> (ii) Address of owner or operator.
>
> (iii) Description of the building, structure, facility, or installation to be demolished or renovated, including the size, age, and prior use of the structure, and the approximate amount of friable asbestos materials present.
>
> (iv) Address or location of the building, structure, facility, or installation.
>
> (v) Scheduled starting and completion dates of demolition or renovation.
>
> (vi) Nature of planned demolition or renovation and method(s) to be employed.
>
> (vii) Procedures to be employed to meet the requirements of this paragraph and paragraph (j) of this section.
>
> (viii) The name and address or location of the waste disposal site where the friable asbestos waste will be deposited.
>
> (ix) Name, title, and authority of the State or local governmental representative who has ordered a demolition which is subject to paragraph (d)(6) of this section.

III. DEPARTMENT OF TRANSPORTATION REGULATIONS

The Department of Transportation (DOT) currently regulates only the transportation of commercial asbestos. They do not regulate:

1. Asbestos which has no commercial value, such as products which contain trace amounts as a contaminant (49 CFR 173.1090(c)).

2. Waste asbestos which is currently proposed to be regulated under DOT hazardous waste regulations (preamble to final commercial asbestos rule issued December 4, 1978).

3. Asbestos which is immersed or fixed in a natural or artificial binder material such as cement, plastic, asphalt, resin, or mineral ore (49 CFR 173.1090(c)).

DOT does regulate commercial asbestos which is defined as any material or product which has commercial value because of its asbestos content (49 CFR 173.1090(a)).

When regulated, DOT requires that shipments of asbestos meet the following requirements:

1. Packaging must be as specified in 49 CFR 173.1090(d):

   a. Leak-tight packages such as metal or fiber drums.

   b. Bags which are dust and sift proof and are unitized on a pallet. Pallet loads should be encased in a shrink wrapped plastic film or fiberboard secured by strapping.

   c. Bags placed inside wooden or fiberboard boxes.

2. Each outside package must be marked with the word "Asbestos" and the name and address of the consignee or consignor (49 CFR 173.304 and 173.306).

3. Each outside container must be marked "ORM-C" in an appropriate rectangle (49 CFR 172.316). Labels which can be used for this purpose are available through normal Firestone stationery store channels. The form number and description for ordering purposes is "S-8974, ORM-C Label".

4. Asbestos shipped via the water or air mode must also meet the following shipping paper requirements (49 CFR 172.200):

a. The total amount of commercial asbestos being shipped, i.e., the net weight of the product containing commercial asbestos (49 CFR 172.202).

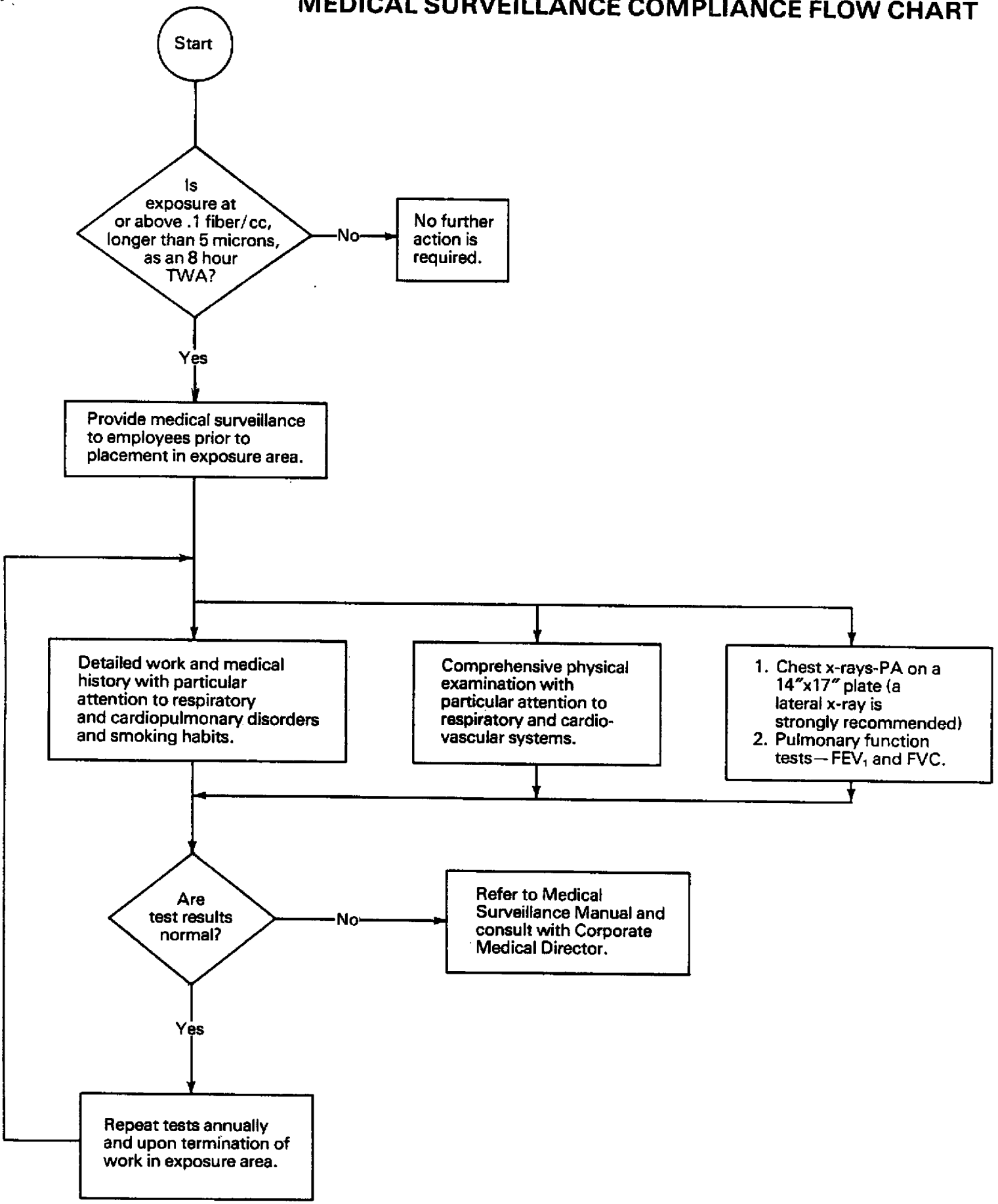
b. The proper shipping name and hazard class, i.e., Asbestos ORM-C (49 CFR 172.202).

c. If shipped on the same bill of lading with non-hazardous materials, the asbestos entry should be before any non-hazardous entries or in a contrasting color (highlighted)(49 CFR 172.201).

d. A signed certification (49 CFR 172.204).

There are no shipping paper requirements when commercial asbestos is shipped via truck or rail modes (49 CFR 172.200).

FEDERAL ASBESTOS STANDARD
MEDICAL SURVEILLANCE COMPLIANCE FLOW CHART



ASBESTOS MANUAL

November 9, 1979

The Firestone Tire & Rubber Company

CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

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CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

INTRODUCTION

Asbestos and materials containing asbestos are now regulated by several federal regulatory agencies. The purpose of this manual is to compile in one document all applicable federal regulations and assist and guide the plants in complying with these regulations.

The use of asbestos or materials containing asbestos in our plants is now very limited. According to the information that we have available, asbestos insulation may still be used or found in the following areas:

Tire Plants

1. Curing area.
   a. Old pipe insulation.
   b. Curing press heat shields.
   c. Board type asbestos insulation between press platens or domes and in the curing press frame. This asbestos material is cut or machined by the McNeil Company or NRM and is only installed by Firestone people.
   d. Pipe insulation installed by McNeil or NRM on new presses that are shipped to Firestone plants.
   e. NRM well insulation.
2. Powerhouse - Plants ten years old or older.
   a. Pipe insulation.
   b. Deaerator heater.
3. Maintenance.
   a. Gaskets made from a material containing asbestos.
   b. Welding blankets or guards.
4. Tire building - Hot knife boxes.
   a. 99R3 TAM - Asbestos tubing 1.5" o.d. - 1.25" i.d. x 1" long, two per machine. This tubing insulates the heated magnets from the rest of the assembly.

      Asbestos tape 0.5" wide x 15" long, four per machine. This tape is wrapped around the heating elements and tubing described above.

b. All Radial First Stage TAM's. Radial sidewall knife - Heat sink hot box. Manganese-nickel wire with asbestos-glass insulation AWG 14, 16" required per machine.

All Other Plants

1. Gaskets made from a material containing asbestos that are cut to size and drilled to open holes.

2. Experimental formulation of small batches of rubber products containing asbestos. This is done in an Akron laboratory of the Synthetic Rubber Division.

Maintenance operations in plants often require the removal or demolition of old asbestos insulation. The removal of asbestos insulation is of considerable importance from the standpoint of compliance with federal regulations since the potential of employee exposure to airborne asbestos fibers is usually higher than in other operations.

The manual is divided into three sections. The first section describes the OSHA standard on asbestos. The second section describes the EPA regulations on asbestos which are applicable to Firestone operations. The third section summarizes the current Department of Transportation regulations on asbestos.

I. OSHA REGULATION SECTION 1910.1001

The OSHA standard on asbestos is described in Section 1910.1001 of the OSHA standards book.

Permissible Average Exposure Limit and Ceiling Concentration

The present 8-hour time-weighted average permissible exposure limit is two (2) fibers, longer than 5 microns, per cubic centimeter of air.

The permissible ceiling exposure limit is ten (10) fibers, longer than 5 microns, per cubic centimeter of air, as determined over a period of 15 minutes.

Air Monitoring and Sampling Frequency

All operations where asbestos and materials containing asbestos are being used or old asbestos insulation is being removed, replaced, or repaired must be monitored by air sampling to determine employee exposure to airborne asbestos fibers.

Samples should be collected from within the breathing zone of the employees on membrane filters mounted in an open face filter holder (cassette). Samples should be taken for the determination of the 8-hour time-weighted average concentration and of the ceiling concentration of asbestos fibers.

Cassettes for collecting air samples for asbestos are provided to the plants by the Industrial Hygiene Department. After sampling, these cassettes are returned to Industrial Hygiene for analysis and calculation of the airborne concentration of asbestos fibers. Detailed instructions on how to collect air samples for asbestos have been sent to the plant safety engineers by the Industrial Hygiene Department.

After the initial determination, samples should be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees to asbestos fibers. In no case should the sampling be done at intervals greater than 6 months for employees whose exposure to asbestos exceeds the permissible exposure limit or the permissible ceiling concentration.

Affected employees, or their representatives, should be given an opportunity to observe the monitoring operation.

Employee Notification and Recordkeeping of Exposure Results

Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the permissible exposure limit or the permissible ceiling concentration must be notified in writing of the exposure as soon as practicable but not later than 5 days of the finding. The employee must also be timely notified of the corrective action taken to reduce the airborne concentration of asbestos fibers.

Every employer must maintain records of any personal or environmental monitoring required by Section 1910.1001. Records must be maintained for a period of at least 20 years and must be made available upon request to the Assistant Secretary of Labor for OSHA, the Director of NIOSH, and to their authorized representatives.

Every employee and former employee shall have reasonable access to any records required to be maintained by this standard, which indicate the employee's own exposure to asbestos fibers.

Methods of Compliance

1. Particular Tools

   All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits listed above, such as saws, scorers, abrasive wheels, and drills, must be provided with local exhaust ventilation systems.

2. Wet Methods

   Insofar as practicable, asbestos must 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 permissible exposure limits, unless the usefulness of the product would be diminished by wetting it.

Spraying, Demolition, or Removal of Asbestos Insulation

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 must be provided with respiratory protective equipment and special clothing as described below.

Respiratory Protective Equipment

1. Air Purifying respirators

   A reusable or single use (disposable) air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 2 but not greater than 20 fibers per cubic centimeter of air.

2. Powered Air Purifying Respirator

   A powered air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 20 but not greater than 200 fibers per cubic centimeter of air.

3. Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type

   A type C continuous flow or pressure-demand supplied-air respirator must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 200 fibers per cubic centimeter of air.

The OSHA standard specifies that employees engaged in the removal or demolition of asbestos insulation shall be provided with supplied-air respirators. For the removal of large sections of insulation which would normally last several days, a supplied-air respirator must be provided. As a general guideline, when the amount of asbestos to be removed is small and the operation will only last a few hours or less, a supplied-air respirator should still be provided if feasible. If this is not feasible, at least an air purifying respirator should be provided.

Special Clothing - Clothes Lockers - Laundering

The employer must 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 permissible exposure limits, or who is engaged in the removal or demolition of asbestos insulation.

At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the permissible exposure limits, the employer must provide change rooms for employees working regularly at the place.

The employer must 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.

Laundering of asbestos contaminated clothing must be done so as to prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Any employer who gives asbestos contaminated clothing to another person for laundering must inform such person of the requirement to effectively prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Contaminated clothing must be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with paragraph (g)(2)(ii) of the standard.

It is now common practice among employers to provide their employees who are engaged in asbestos insulation removal with disposable coveralls, head coverings and shoe coverings. The use of disposable protective clothing eliminates the necessity of laundering work clothes contaminated with asbestos and all other problems associated with it.

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4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

c. No asbestos debris shall be dropped or thrown to the ground or from one floor to another. For buildings 50 feet or greater in height, asbestos debris shall be lowered to the ground via dust-tight chutes or containers.

d. Written notice of intention to demolish shall be provided to the US-EPA Regional Administrator at least 10 days prior to commencement of demolition. This notice shall include items under Section 61.22(d)(2) of this regulation.

e. Certain demolition operations are exempt from the regulations, except for the wetting of asbestos debris and the notification requirement, if a building has been declared to be structurally unsound and in danger of imminent collapse.

f. Asbestos waste shall be sealed in leak-tight containers while wet, prior to being sent to an approved waste disposal site.

g. The leak-tight containers (Item f) should be labeled with a warning label which reads:

CAUTION

Contains Asbestos

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

h. The owner or operator of a demolition operation is exempted from these requirements, with the exception of Item d above, provided the amount of friable asbestos materials in the building or portion thereof to be demolished is less than 80 meters (ca. 260 feet) used on pipes, and less than 15 square meters (ca. 160 square feet) used on any duct, boiler, tank, reactor, turbine, furnace, or structural member.

These regulations also set forth collection, processing, and disposal requirements which the waste disposal firm must adhere to in handling and disposing of this waste (40 CFR 61.25). Since Firestone in most cases, if not all, will be utilizing outside firms for disposal of its asbestos wastes, no further

discussion of these requirements will be presented herein. Firestone, however, must verify that any firm selected to dispose of its asbestos waste will meet the requirements of paragraph 61.25 (i.e., approved operation).

Following is Section 61.22(d)(2) of the Emission standard:

> Written notice of intention to demolish or renovate shall be provided to the Administrator by the owner or operator of the demolition or renovation operation. Such notice shall be postmarked or delivered to the Administrator at least 10 days prior to commencement of demolition, or as early as possible prior to commencement of emergency demolition subject to paragraph (d)(6) of this section, and as early as possible prior to commencement of renovation. Such notice shall include the following information:
>
> (i) Name of owner or operator.
>
> (ii) Address of owner or operator.
>
> (iii) Description of the building, structure, facility, or installation to be demolished or renovated, including the size, age, and prior use of the structure, and the approximate amount of friable asbestos materials present.
>
> (iv) Address or location of the building, structure, facility, or installation.
>
> (v) Scheduled starting and completion dates of demolition or renovation.
>
> (vi) Nature of planned demolition or renovation and method(s) to be employed.
>
> (vii) Procedures to be employed to meet the requirements of this paragraph and paragraph (j) of this section.
>
> (viii) The name and address or location of the waste disposal site where the friable asbestos waste will be deposited.
>
> (ix) Name, title, and authority of the State or local governmental representative who has ordered a demolition which is subject to paragraph (d)(6) of this section.

III. DEPARTMENT OF TRANSPORTATION REGULATIONS

The Department of Transportation (DOT) currently regulates only the transportation of commercial asbestos. They do not regulate:

1. Asbestos which has no commercial value, such as products which contain trace amounts as a contaminant (49 CFR 173.1090(c)).

2. Waste asbestos which is currently proposed to be regulated under DOT hazardous waste regulations (preamble to final commercial asbestos rule issued December 4, 1978).

3. Asbestos which is immersed or fixed in a natural or artificial binder material such as cement, plastic, asphalt, resin, or mineral ore (49 CFR 173.1090(c)).

DOT does regulate commercial asbestos which is defined as any material or product which has commercial value because of its asbestos content (49 CFR 173.1090(a)).

When regulated, DOT requires that shipments of asbestos meet the following requirements:

1. Packaging must be as specified in 49 CFR 173.1090(d):

   a. Leak-tight packages such as metal or fiber drums.

   b. Bags which are dust and sift proof and are unitized on a pallet. Pallet loads should be encased in a shrink wrapped plastic film or fiberboard secured by strapping.

   c. Bags placed inside wooden or fiberboard boxes.

2. Each outside package must be marked with the word "Asbestos" and the name and address of the consignee or consignor (49 CFR 173.304 and 173.306).

3. Each outside container must be marked "ORM-C" in an appropriate rectangle (49 CFR 172.316). Labels which can be used for this purpose are available through normal Firestone stationery store channels. The form number and description for ordering purposes is "S-8974, ORM-C Label".

4. Asbestos shipped via the water or air mode must also meet the following shipping paper requirements (49 CFR 172.200):

a. The total amount of commercial asbestos being shipped, i.e., the net weight of the product containing commercial asbestos (49 CFR 172.202).

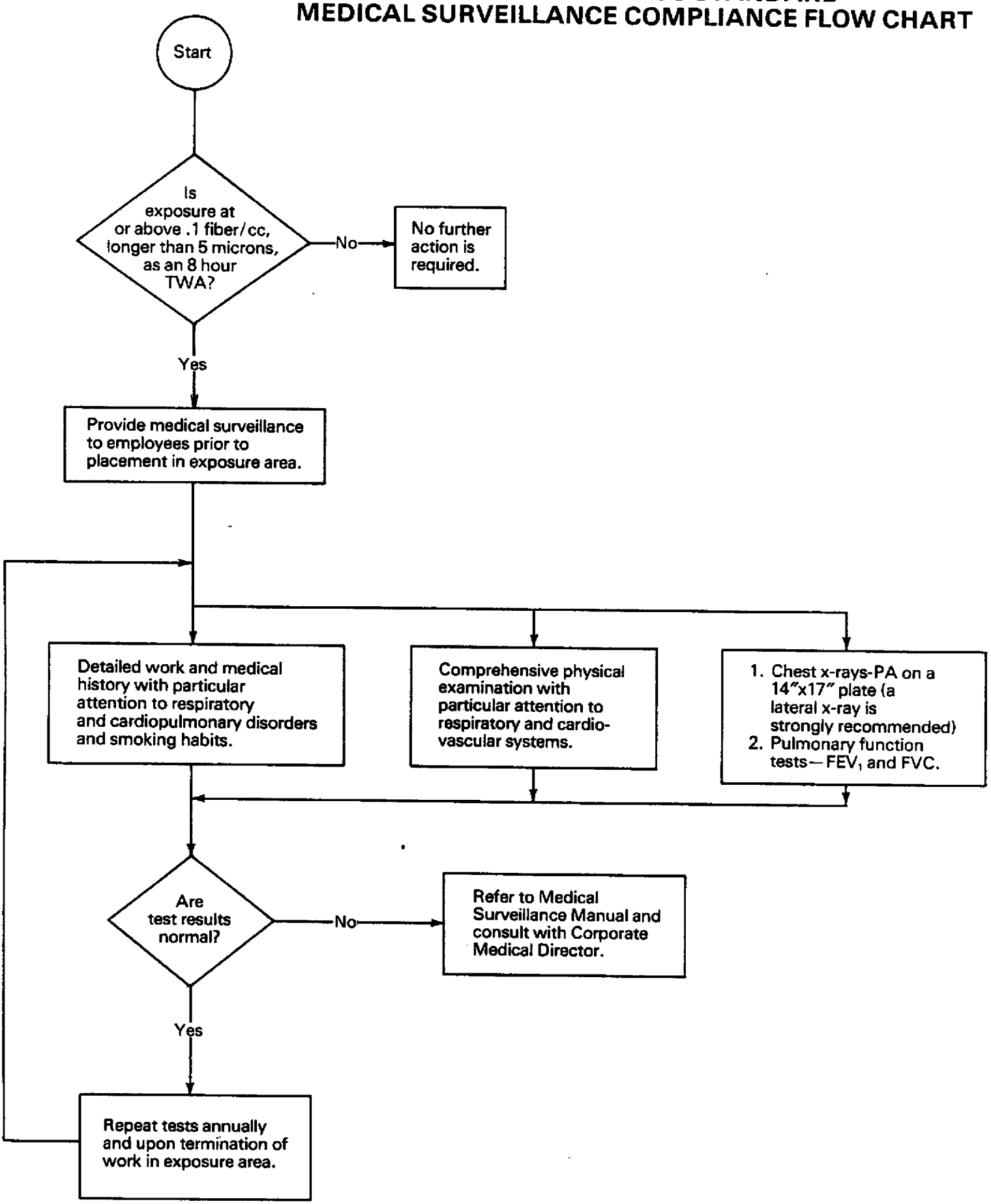
b. The proper shipping name and hazard class, i.e., Asbestos ORM-C (49 CFR 172.202).

c. If shipped on the same bill of lading with non-hazardous materials, the asbestos entry should be before any non-hazardous entries or in a contrasting color (highlighted)(49 CFR 172.201).

d. A signed certification (49 CFR 172.204).

There are no shipping paper requirements when commercial asbestos is shipped via truck or rail modes (49 CFR 172.200).

FEDERAL ASBESTOS STANDARD
MEDICAL SURVEILLANCE COMPLIANCE FLOW CHART



ASBESTOS MANUAL

November 9, 1979

The Firestone Tire & Rubber Company

CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

BATO/JACKSON 049688

CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

INTRODUCTION

Asbestos and materials containing asbestos are now regulated by several federal regulatory agencies. The purpose of this manual is to compile in one document all applicable federal regulations and assist and guide the plants in complying with these regulations.

The use of asbestos or materials containing asbestos in our plants is now very limited. According to the information that we have available, asbestos insulation may still be used or found in the following areas:

Tire Plants

1. Curing area.
   a. Old pipe insulation.
   b. Curing press heat shields.
   c. Board type asbestos insulation between press platens or domes and in the curing press frame. This asbestos material is cut or machined by the McNeil Company or NRM and is only installed by Firestone people.
   d. Pipe insulation installed by McNeil or NRM on new presses that are shipped to Firestone plants.
   e. NRM well insulation.
2. Powerhouse - Plants ten years old or older.
   a. Pipe insulation.
   b. Deaerator heater.
3. Maintenance.
   a. Gaskets made from a material containing asbestos.
   b. Welding blankets or guards.
4. Tire building - Hot knife boxes.
   a. 99R3 TAM - Asbestos tubing 1.5" o.d. - 1.25" i.d. x 1" long, two per machine. This tubing insulates the heated magnets from the rest of the assembly.

      Asbestos tape 0.5" wide x 15" long, four per machine. This tape is wrapped around the heating elements and tubing described above.

b. All Radial First Stage TAM's. Radial sidewall knife - Heat sink hot box. Manganese-nickel wire with asbestos-glass insulation AWG 14, 16" required per machine.

All Other Plants

1. Gaskets made from a material containing asbestos that are cut to size and drilled to open holes.

2. Experimental formulation of small batches of rubber products containing asbestos. This is done in an Akron laboratory of the Synthetic Rubber Division.

Maintenance operations in plants often require the removal or demolition of old asbestos insulation. The removal of asbestos insulation is of considerable importance from the standpoint of compliance with federal regulations since the potential of employee exposure to airborne asbestos fibers is usually higher than in other operations.

The manual is divided into three sections. The first section describes the OSHA standard on asbestos. The second section describes the EPA regulations on asbestos which are applicable to Firestone operations. The third section summarizes the current Department of Transportation regulations on asbestos.

I. OSHA REGULATION SECTION 1910.1001

The OSHA standard on asbestos is described in Section 1910. 1001 of the OSHA standards book.

Permissible Average Exposure Limit and Ceiling Concentration

The present 8-hour time-weighted average permissible exposure limit is two (2) fibers, longer than 5 microns, per cubic centimeter of air.

The permissible ceiling exposure limit is ten (10) fibers, longer than 5 microns, per cubic centimeter of air, as determined over a period of 15 minutes.

Air Monitoring and Sampling Frequency

All operations where asbestos and materials containing asbestos are being used or old asbestos insulation is being removed, replaced, or repaired must be monitored by air sampling to determine employee exposure to airborne asbestos fibers.

Samples should be collected from within the breathing zone of the employees on membrane filters mounted in an open face filter holder (cassette). Samples should be taken for the determination of the 8-hour time-weighted average concentration and of the ceiling concentration of asbestos fibers.

Cassettes for collecting air samples for asbestos are provided to the plants by the Industrial Hygiene Department. After sampling, these cassettes are returned to Industrial Hygiene for analysis and calculation of the airborne concentration of asbestos fibers. Detailed instructions on how to collect air samples for asbestos have been sent to the plant safety engineers by the Industrial Hygiene Department.

After the initial determination, samples should be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees to asbestos fibers. In no case should the sampling be done at intervals greater than 6 months for employees whose exposure to asbestos exceeds the permissible exposure limit or the permissible ceiling concentration.

Affected employees, or their representatives, should be given an opportunity to observe the monitoring operation.

Employee Notification and Recordkeeping of Exposure Results

Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the permissible exposure limit or the permissible ceiling concentration must be notified in writing of the exposure as soon as practicable but not later than 5 days of the finding. The employee must also be timely notified of the corrective action taken to reduce the airborne concentration of asbestos fibers.

Every employer must maintain records of any personal or environmental monitoring required by Section 1910.1001. Records must be maintained for a period of at least 20 years and must be made available upon request to the Assistant Secretary of Labor for OSHA, the Director of NIOSH, and to their authorized representatives.

Every employee and former employee shall have reasonable access to any records required to be maintained by this standard, which indicate the employee's own exposure to asbestos fibers.

Methods of Compliance

1. Particular Tools

   All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits listed above, such as saws, scorers, abrasive wheels, and drills, must be provided with local exhaust ventilation systems.

2. Wet Methods

   Insofar as practicable, asbestos must 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 permissible exposure limits, unless the usefulness of the product would be diminished by wetting it.

Spraying, Demolition, or Removal of Asbestos Insulation

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 must be provided with respiratory protective equipment and special clothing as described below.

Respiratory Protective Equipment

1. Air Purifying respirators

   A reusable or single use (disposable) air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 2 but not greater than 20 fibers per cubic centimeter of air.

2. Powered Air Purifying Respirator

   A powered air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 20 but not greater than 200 fibers per cubic centimeter of air.

3. Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type

   A type C continuous flow or pressure-demand supplied-air respirator must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 200 fibers per cubic centimeter of air.

The OSHA standard specifies that employees engaged in the removal or demolition of asbestos insulation shall be provided with supplied-air respirators. For the removal of large sections of insulation which would normally last several days, a supplied-air respirator must be provided. As a general guideline, when the amount of asbestos to be removed is small and the operation will only last a few hours or less, a supplied-air respirator should still be provided if feasible. If this is not feasible, at least an air purifying respirator should be provided.

Special Clothing - Clothes Lockers - Laundering

The employer must 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 permissible exposure limits, or who is engaged in the removal or demolition of asbestos insulation.

At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the permissible exposure limits, the employer must provide change rooms for employees working regularly at the place.

The employer must 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.

Laundering of asbestos contaminated clothing must be done so as to prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Any employer who gives asbestos contaminated clothing to another person for laundering must inform such person of the requirement to effectively prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Contaminated clothing must be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with paragraph (g)(2)(ii) of the standard.

It is now common practice among employers to provide their employees who are engaged in asbestos insulation removal with disposable coveralls, head coverings and shoe coverings. The use of disposable protective clothing eliminates the necessity of laundering work clothes contaminated with asbestos and all other problems associated with it.

Caution Signs and Caution Labels

Caution signs must be provided and displayed at each location where airborne concentrations of asbestos fibers may exceed the permissible exposure limits. Signs must 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 must be posted at all approaches to areas containing excessive concentrations of asbestos fibers.

The signs must display a legend which is described in paragraph (g)(1)(ii) of this standard.

Since during the short time needed for a demolition or removal of asbestos insulation it is not usually possible to determine if the concentration of airborne fibers is above or below the permissible exposure limits, caution signs should be posted at all asbestos removal operations. These signs should be removed after the work is completed.

Caution labels must 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 no airborne concentrations of asbestos fibers in excess of the permissible exposure limits will be released.

The statement that is required on the label is described in paragraph (g)(2)(ii) of this standard.

Housekeeping - Waste Disposal

All external surfaces in any place of employment must be maintained free of accumulations of asbestos fibers. Collection of settled dust or debris should be done by vacuum cleaning. Do not clean up asbestos by blowing or dry sweeping.

Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, that is to be disposed of, must be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

The federal regulations pertaining to asbestos waste disposal practices and procedures are described in the next section of the manual under US-EPA Regulations.

Medical Examinations

The standard requires that the employer provide or make available at his cost medical examinations to each of his employees exposed to asbestos fibers. The medical examinations program required by OSHA is presented below (this is a copy of the medical surveillance program for asbestos which has been adopted by the Corporate Medical Department).

ASBESTOS

A. Reason for medical surveillance

   1. Required by the OSHA asbestos standard (29 CFR 1910. 1001 (j))

B. Forms of asbestos included

   1. Chrysotile
   2. Amosite

3. Crocidolite
4. Tremolite
5. Anthophyllite
6. Actinolite

C. Level of exposure

1. Airborne exposure to asbestos at or above 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

Note: This definition of exposure has been established by OSHA Program Directive 300-16, effective October 11, 1978, and will not be found in the original OSHA asbestos standard.

D. Types of medical tests and procedures

1. Detailed work and medical history with particular attention to

a. Respiratory and cardiopulmonary disorders
b. Smoking habits

2. Comprehensive physical examination with particular attention to respiratory and cardiovascular systems

3. Chest x-rays - PA on 14" x 17" plate (a lateral x-ray is also strongly recommended)

4. Pulmonary function tests - FEV_1 and FVC

E. Frequency of medical tests and procedures

1. All tests and procedures

a. Prior to or within 30 days after placement in an exposure area where airborne asbestos levels exceed 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

b. At least annually while working in the exposure area

c. Within 30 days before or after termination of employment in an exposure area unless all the tests and procedures have been performed within the past year

F. Interpretation of medical tests and procedures

1. Chest x-rays should be interpreted by a radiologist

2. In order to unify and standardize the pulmonary function tests, the actual administration of the tests should be done by as few people as possible. The original tracing and interpretation should be given to the plant physician for medical management. A copy of each should be sent to the Corporate Medical Department for short and long term interpretation, study, and storage.

3. Whenever an employee shows signs or symptoms of chronic non-malignant or malignant lung disease or cardiopulmonary disorders which may be due to occupational exposure to asbestos, the Corporate Medical Department should be consulted.

4. Any abnormality in the chest x-rays as compared to established norms or earlier findings, a definite reduction in the FEV_1 or FVC, or degeneration of the employee's general respiratory condition should be reasons for not employing or for removing the employee from the asbestos exposure area.

5. The responsibility for medical removal and reinstatement is that of the plant physician in consultation with as many other physicians as he deems necessary.

6. Medical records of employees examined under this protocol, including examination and test results, written medical opinions, and records of employee complaints, should be retained for at least five years after the last employment for each employee, or for twenty years from the date of the record, whichever is longer.

II. US-EPA REGULATION

Introduction

The US-EPA has established emission standards for certain hazardous air pollutants under its National Emission Standards for Hazardous Air Pollutants Regulations (NESHAPS). Asbestos is included as one of the four substances currently regulated under these regulations (40 CFR Part 61, Subpart B).

The NESHAPS regulations are applicable to the following operations:

a) asbestos mills
b) roadways
c) manufacturing
d) demolition and renovation
e) spraying
f) fabricating
g) insulating
h) waste disposal

Based upon Environmental Engineering's knowledge, Firestone is mainly involved in Items (d) and (h) above.

US-EPA intentions are to administer these regulations on a state by state basis by delegating authority to the individual state air control agencies (i.e., once they have met all the necessary requirements). To date, 31 states have been given this authority as follows: Alabama, Arizona, California, Colorado, Connecticut, Delaware, Georgia, Indiana, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, Texas, Vermont, Virginia, Washington, Wisconsin, Puerto Rico, and U. S. Virgin Islands.

These regulations (i.e., NESHAPS) for controlling asbestos emissions were first promulgated on April 6, 1973 (38 FR 8820) in fulfilling requirements under Section 112 (B) of the Clean Air Act, as amended December 1970. Since then they have undergone various revisions, the most recent of which was promulgated February 7, 1979, giving the State of Texas authority to administer the NESHAPS program and issue permits, etc. in the state.

From time to time additional pollutants which are found to be hazardous[1] will be included under EPA NESHAPS regulations (i.e., vinyl chloride was added to the original list on October 21, 1976, 41 FR 46560).

[1]May cause, or contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness - Clean Air Act, Section 112(1), December 1970.

Reason for Control of Asbestos Emissions

A large number of studies have shown an association between occupational exposure to asbestos and a higher than expected incidence of bronchial cancer. Asbestos also has been identified as a causal factor in the development of cancers of the membranes of the chest and abdomen.

Emission Standard for Asbestos

Basically the regulations prohibit any discharge of asbestos to the outside air which creates a visible emission which may be detected without the aid of instruments. By definition, outside air means the air outside buildings or structures.

A source can use a specified method of air cleaning (fabric filter systems, etc.) to eliminate such emissions, provided that the emission control equipment is approved by the administrator of the US-EPA or his authorized representative.

Specifically the asbestos standards are:

1. There shall be no visible emissions to the outside air from any asbestos mill, except when a specified method of air cleaning, also part of these standards, is used before the emissions escape to the outside air. In general, these air-cleaning systems filter asbestos emissions to the point that visible emissions would not be produced anyway.

2. The surfacing of roadways with asbestos tailings is prohibited, except for temporary roadways in an area of asbestos ore deposits.

3. There shall be no visible emissions to the outside air, unless the specified air cleaning methods are used, from any operation which manufacturers: cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, other textile products, cement products, fireproofing and insulating materials, friction products, paper, millboard, felt, floor tile, paints, coatings, caulks, adhesives, sealants, plastics and rubber materials, and chlorine.

4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

c. No asbestos debris shall be dropped or thrown to the ground or from one floor to another. For buildings 50 feet or greater in height, asbestos debris shall be lowered to the ground via dust-tight chutes or containers.

d. Written notice of intention to demolish shall be provided to the US-EPA Regional Administrator at least 10 days prior to commencement of demolition. This notice shall include items under Section 61.22(d)(2) of this regulation.

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f. Asbestos waste shall be sealed in leak-tight containers while wet, prior to being sent to an approved waste disposal site.

g. The leak-tight containers (Item f) should be labeled with a warning label which reads:

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Contains Asbestos

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

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> (iv) Address or location of the building, structure, facility, or installation.
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> (v) Scheduled starting and completion dates of demolition or renovation.
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> (vi) Nature of planned demolition or renovation and method(s) to be employed.
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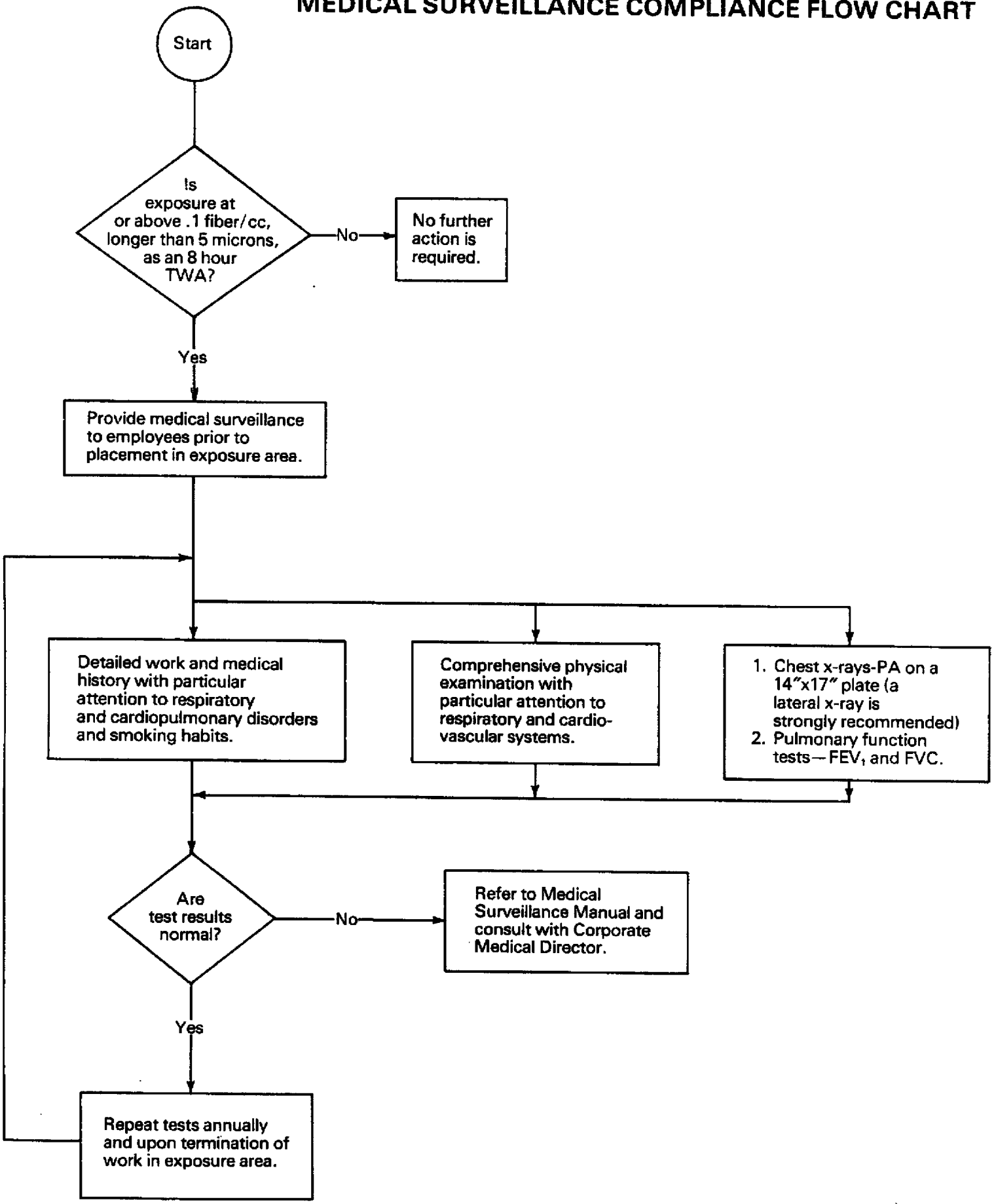
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d. A signed certification (49 CFR 172.204).

There are no shipping paper requirements when commercial asbestos is shipped via truck or rail modes (49 CFR 172.200).

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CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

BATO/JACKSON 049707

CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

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The use of asbestos or materials containing asbestos in our plants is now very limited. According to the information that we have available, asbestos insulation may still be used or found in the following areas:

Tire Plants

1. Curing area.
   a. Old pipe insulation.
   b. Curing press heat shields.
   c. Board type asbestos insulation between press platens or domes and in the curing press frame. This asbestos material is cut or machined by the McNeil Company or NRM and is only installed by Firestone people.
   d. Pipe insulation installed by McNeil or NRM on new presses that are shipped to Firestone plants.
   e. NRM well insulation.
2. Powerhouse - Plants ten years old or older.
   a. Pipe insulation.
   b. Deaerator heater.
3. Maintenance.
   a. Gaskets made from a material containing asbestos.
   b. Welding blankets or guards.
4. Tire building - Hot knife boxes.
   a. 99R3 TAM - Asbestos tubing 1.5" o.d. - 1.25" i.d. x 1" long, two per machine. This tubing insulates the heated magnets from the rest of the assembly.

      Asbestos tape 0.5" wide x 15" long, four per machine. This tape is wrapped around the heating elements and tubing described above.

b. All Radial First Stage TAM's. Radial sidewall knife - Heat sink hot box. Manganese-nickel wire with asbestos-glass insulation AWG 14, 16" required per machine.

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1. Gaskets made from a material containing asbestos that are cut to size and drilled to open holes.

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Maintenance operations in plants often require the removal or demolition of old asbestos insulation. The removal of asbestos insulation is of considerable importance from the standpoint of compliance with federal regulations since the potential of employee exposure to airborne asbestos fibers is usually higher than in other operations.

The manual is divided into three sections. The first section describes the OSHA standard on asbestos. The second section describes the EPA regulations on asbestos which are applicable to Firestone operations. The third section summarizes the current Department of Transportation regulations on asbestos.

I. OSHA REGULATION SECTION 1910.1001

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All operations where asbestos and materials containing asbestos are being used or old asbestos insulation is being removed, replaced, or repaired must be monitored by air sampling to determine employee exposure to airborne asbestos fibers.

Samples should be collected from within the breathing zone of the employees on membrane filters mounted in an open face filter holder (cassette). Samples should be taken for the determination of the 8-hour time-weighted average concentration and of the ceiling concentration of asbestos fibers.

Cassettes for collecting air samples for asbestos are provided to the plants by the Industrial Hygiene Department. After sampling, these cassettes are returned to Industrial Hygiene for analysis and calculation of the airborne concentration of asbestos fibers. Detailed instructions on how to collect air samples for asbestos have been sent to the plant safety engineers by the Industrial Hygiene Department.

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Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the permissible exposure limit or the permissible ceiling concentration must be notified in writing of the exposure as soon as practicable but not later than 5 days of the finding. The employee must also be timely notified of the corrective action taken to reduce the airborne concentration of asbestos fibers.

Every employer must maintain records of any personal or environmental monitoring required by Section 1910.1001. Records must be maintained for a period of at least 20 years and must be made available upon request to the Assistant Secretary of Labor for OSHA, the Director of NIOSH, and to their authorized representatives.

Every employee and former employee shall have reasonable access to any records required to be maintained by this standard, which indicate the employee's own exposure to asbestos fibers.

Methods of Compliance

1. Particular Tools

   All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits listed above, such as saws, scorers, abrasive wheels, and drills, must be provided with local exhaust ventilation systems.

2. Wet Methods

   Insofar as practicable, asbestos must 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 permissible exposure limits, unless the usefulness of the product would be diminished by wetting it.

Spraying, Demolition, or Removal of Asbestos Insulation

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 must be provided with respiratory protective equipment and special clothing as described below.

Respiratory Protective Equipment

1. Air Purifying respirators

   A reusable or single use (disposable) air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 2 but not greater than 20 fibers per cubic centimeter of air.

2. Powered Air Purifying Respirator

   A powered air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 20 but not greater than 200 fibers per cubic centimeter of air.

3. Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type

   A type C continuous flow or pressure-demand supplied-air respirator must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 200 fibers per cubic centimeter of air.

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The employer must 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 permissible exposure limits, or who is engaged in the removal or demolition of asbestos insulation.

At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the permissible exposure limits, the employer must provide change rooms for employees working regularly at the place.

The employer must 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.

Laundering of asbestos contaminated clothing must be done so as to prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Any employer who gives asbestos contaminated clothing to another person for laundering must inform such person of the requirement to effectively prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Contaminated clothing must be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with paragraph (g)(2)(ii) of the standard.

It is now common practice among employers to provide their employees who are engaged in asbestos insulation removal with disposable coveralls, head coverings and shoe coverings. The use of disposable protective clothing eliminates the necessity of laundering work clothes contaminated with asbestos and all other problems associated with it.

Caution Signs and Caution Labels

Caution signs must be provided and displayed at each location where airborne concentrations of asbestos fibers may exceed the permissible exposure limits. Signs must 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 must be posted at all approaches to areas containing excessive concentrations of asbestos fibers.

The signs must display a legend which is described in paragraph (g)(1)(ii) of this standard.

Since during the short time needed for a demolition or removal of asbestos insulation it is not usually possible to determine if the concentration of airborne fibers is above or below the permissible exposure limits, caution signs should be posted at all asbestos removal operations. These signs should be removed after the work is completed.

Caution labels must 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 no airborne concentrations of asbestos fibers in excess of the permissible exposure limits will be released.

The statement that is required on the label is described in paragraph (g)(2)(ii) of this standard.

Housekeeping - Waste Disposal

All external surfaces in any place of employment must be maintained free of accumulations of asbestos fibers. Collection of settled dust or debris should be done by vacuum cleaning. Do not clean up asbestos by blowing or dry sweeping.

Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, that is to be disposed of, must be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

The federal regulations pertaining to asbestos waste disposal practices and procedures are described in the next section of the manual under US-EPA Regulations.

Medical Examinations

The standard requires that the employer provide or make available at his cost medical examinations to each of his employees exposed to asbestos fibers. The medical examinations program required by OSHA is presented below (this is a copy of the medical surveillance program for asbestos which has been adopted by the Corporate Medical Department).

ASBESTOS

A. Reason for medical surveillance

1. Required by the OSHA asbestos standard (29 CFR 1910. 1001 (j))

B. Forms of asbestos included

1. Chrysotile
2. Amosite

3. Crocidolite
4. Tremolite
5. Anthophyllite
6. Actinolite

C. Level of exposure

1. Airborne exposure to asbestos at or above 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

Note: This definition of exposure has been established by OSHA Program Directive 300-16, effective October 11, 1978, and will not be found in the original OSHA asbestos standard.

D. Types of medical tests and procedures

1. Detailed work and medical history with particular attention to

a. Respiratory and cardiopulmonary disorders
b. Smoking habits

2. Comprehensive physical examination with particular attention to respiratory and cardiovascular systems

3. Chest x-rays - PA on 14" x 17" plate (a lateral x-ray is also strongly recommended)

4. Pulmonary function tests - FEV_1 and FVC

E. Frequency of medical tests and procedures

1. All tests and procedures

a. Prior to or within 30 days after placement in an exposure area where airborne asbestos levels exceed 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

b. At least annually while working in the exposure area

c. Within 30 days before or after termination of employment in an exposure area unless all the tests and procedures have been performed within the past year

F. Interpretation of medical tests and procedures

1. Chest x-rays should be interpreted by a radiologist

2. In order to unify and standardize the pulmonary function tests, the actual administration of the tests should be done by as few people as possible. The original tracing and interpretation should be given to the plant physician for medical management. A copy of each should be sent to the Corporate Medical Department for short and long term interpretation, study, and storage.

3. Whenever an employee shows signs or symptoms of chronic non-malignant or malignant lung disease or cardiopulmonary disorders which may be due to occupational exposure to asbestos, the Corporate Medical Department should be consulted.

4. Any abnormality in the chest x-rays as compared to established norms or earlier findings, a definite reduction in the FEV_1 or FVC, or degeneration of the employee's general respiratory condition should be reasons for not employing or for removing the employee from the asbestos exposure area.

5. The responsibility for medical removal and reinstatement is that of the plant physician in consultation with as many other physicians as he deems necessary.

6. Medical records of employees examined under this protocol, including examination and test results, written medical opinions, and records of employee complaints, should be retained for at least five years after the last employment for each employee, or for twenty years from the date of the record, whichever is longer.

II. US-EPA REGULATION

Introduction

The US-EPA has established emission standards for certain hazardous air pollutants under its National Emission Standards for Hazardous Air Pollutants Regulations (NESHAPS). Asbestos is included as one of the four substances currently regulated under these regulations (40 CFR Part 61, Subpart B).

The NESHAPS regulations are applicable to the following operations:

a) asbestos mills
b) roadways
c) manufacturing
d) demolition and renovation
e) spraying
f) fabricating
g) insulating
h) waste disposal

Based upon Environmental Engineering's knowledge, Firestone is mainly involved in Items (d) and (h) above.

US-EPA intentions are to administer these regulations on a state by state basis by delegating authority to the individual state air control agencies (i.e., once they have met all the necessary requirements). To date, 31 states have been given this authority as follows: Alabama, Arizona, California, Colorado, Connecticut, Delaware, Georgia, Indiana, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, Texas, Vermont, Virginia, Washington, Wisconsin, Puerto Rico, and U. S. Virgin Islands.

These regulations (i.e., NESHAPS) for controlling asbestos emissions were first promulgated on April 6, 1973 (38 FR 8820) in fulfilling requirements under Section 112 (B) of the Clean Air Act, as amended December 1970. Since then they have undergone various revisions, the most recent of which was promulgated February 7, 1979, giving the State of Texas authority to administer the NESHAPS program and issue permits, etc. in the state.

From time to time additional pollutants which are found to be hazardous[1] will be included under EPA NESHAPS regulations (i.e., vinyl chloride was added to the original list on October 21, 1976, 41 FR 46560).

[1]May cause, or contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness - Clean Air Act, Section 112(1), December 1970.

Reason for Control of Asbestos Emissions

A large number of studies have shown an association between occupational exposure to asbestos and a higher than expected incidence of bronchial cancer. Asbestos also has been identified as a causal factor in the development of cancers of the membranes of the chest and abdomen.

Emission Standard for Asbestos

Basically the regulations prohibit any discharge of asbestos to the outside air which creates a visible emission which may be detected without the aid of instruments. By definition, outside air means the air outside buildings or structures.

A source can use a specified method of air cleaning (fabric filter systems, etc.) to eliminate such emissions, provided that the emission control equipment is approved by the administrator of the US-EPA or his authorized representative.

Specifically the asbestos standards are:

1. There shall be no visible emissions to the outside air from any asbestos mill, except when a specified method of air cleaning, also part of these standards, is used before the emissions escape to the outside air. In general, these air-cleaning systems filter asbestos emissions to the point that visible emissions would not be produced anyway.

2. The surfacing of roadways with asbestos tailings is prohibited, except for temporary roadways in an area of asbestos ore deposits.

3. There shall be no visible emissions to the outside air, unless the specified air cleaning methods are used, from any operation which manufacturers: cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, other textile products, cement products, fireproofing and insulating materials, friction products, paper, millboard, felt, floor tile, paints, coatings, caulks, adhesives, sealants, plastics and rubber materials, and chlorine.

4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

c. No asbestos debris shall be dropped or thrown to the ground or from one floor to another. For buildings 50 feet or greater in height, asbestos debris shall be lowered to the ground via dust-tight chutes or containers.

d. Written notice of intention to demolish shall be provided to the US-EPA Regional Administrator at least 10 days prior to commencement of demolition. This notice shall include items under Section 61.22(d)(2) of this regulation.

e. Certain demolition operations are exempt from the regulations, except for the wetting of asbestos debris and the notification requirement, if a building has been declared to be structurally unsound and in danger of imminent collapse.

f. Asbestos waste shall be sealed in leak-tight containers while wet, prior to being sent to an approved waste disposal site.

g. The leak-tight containers (Item f) should be labeled with a warning label which reads:

CAUTION

Contains Asbestos

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

h. The owner or operator of a demolition operation is exempted from these requirements, with the exception of Item d above, provided the amount of friable asbestos materials in the building or portion thereof to be demolished is less than 80 meters (ca. 260 feet) used on pipes, and less than 15 square meters (ca. 160 square feet) used on any duct, boiler, tank, reactor, turbine, furnace, or structural member.

These regulations also set forth collection, processing, and disposal requirements which the waste disposal firm must adhere to in handling and disposing of this waste (40 CFR 61.25). Since Firestone in most cases, if not all, will be utilizing outside firms for disposal of its asbestos wastes, no further

discussion of these requirements will be presented herein. Firestone, however, must verify that any firm selected to dispose of its asbestos waste will meet the requirements of paragraph 61.25 (i.e., approved operation).

Following is Section 61.22(d)(2) of the Emission standard:

> Written notice of intention to demolish or renovate shall be provided to the Administrator by the owner or operator of the demolition or renovation operation. Such notice shall be postmarked or delivered to the Administrator at least 10 days prior to commencement of demolition, or as early as possible prior to commencement of emergency demolition subject to paragraph (d)(6) of this section, and as early as possible prior to commencement of renovation. Such notice shall include the following information:
>
> (i) Name of owner or operator.
>
> (ii) Address of owner or operator.
>
> (iii) Description of the building, structure, facility, or installation to be demolished or renovated, including the size, age, and prior use of the structure, and the approximate amount of friable asbestos materials present.
>
> (iv) Address or location of the building, structure, facility, or installation.
>
> (v) Scheduled starting and completion dates of demolition or renovation.
>
> (vi) Nature of planned demolition or renovation and method(s) to be employed.
>
> (vii) Procedures to be employed to meet the requirements of this paragraph and paragraph (j) of this section.
>
> (viii) The name and address or location of the waste disposal site where the friable asbestos waste will be deposited.
>
> (ix) Name, title, and authority of the State or local governmental representative who has ordered a demolition which is subject to paragraph (d)(6) of this section.

III. DEPARTMENT OF TRANSPORTATION REGULATIONS

The Department of Transportation (DOT) currently regulates only the transportation of commercial asbestos. They do not regulate:

1. Asbestos which has no commercial value, such as products which contain trace amounts as a contaminant (49 CFR 173.1090(c)).

2. Waste asbestos which is currently proposed to be regulated under DOT hazardous waste regulations (preamble to final commercial asbestos rule issued December 4, 1978).

3. Asbestos which is immersed or fixed in a natural or artificial binder material such as cement, plastic, asphalt, resin, or mineral ore (49 CFR 173.1090(c)).

DOT does regulate commercial asbestos which is defined as any material or product which has commercial value because of its asbestos content (49 CFR 173.1090(a)).

When regulated, DOT requires that shipments of asbestos meet the following requirements:

1. Packaging must be as specified in 49 CFR 173.1090(d):

   a. Leak-tight packages such as metal or fiber drums.

   b. Bags which are dust and sift proof and are unitized on a pallet. Pallet loads should be encased in a shrink wrapped plastic film or fiberboard secured by strapping.

   c. Bags placed inside wooden or fiberboard boxes.

2. Each outside package must be marked with the word "Asbestos" and the name and address of the consignee or consignor (49 CFR 173.304 and 173.306).

3. Each outside container must be marked "ORM-C" in an appropriate rectangle (49 CFR 172.316). Labels which can be used for this purpose are available through normal Firestone stationery store channels. The form number and description for ordering purposes is "S-8974, ORM-C Label".

4. Asbestos shipped via the water or air mode must also meet the following shipping paper requirements (49 CFR 172.200):

a. The total amount of commercial asbestos being shipped, i.e., the net weight of the product containing commercial asbestos (49 CFR 172.202).

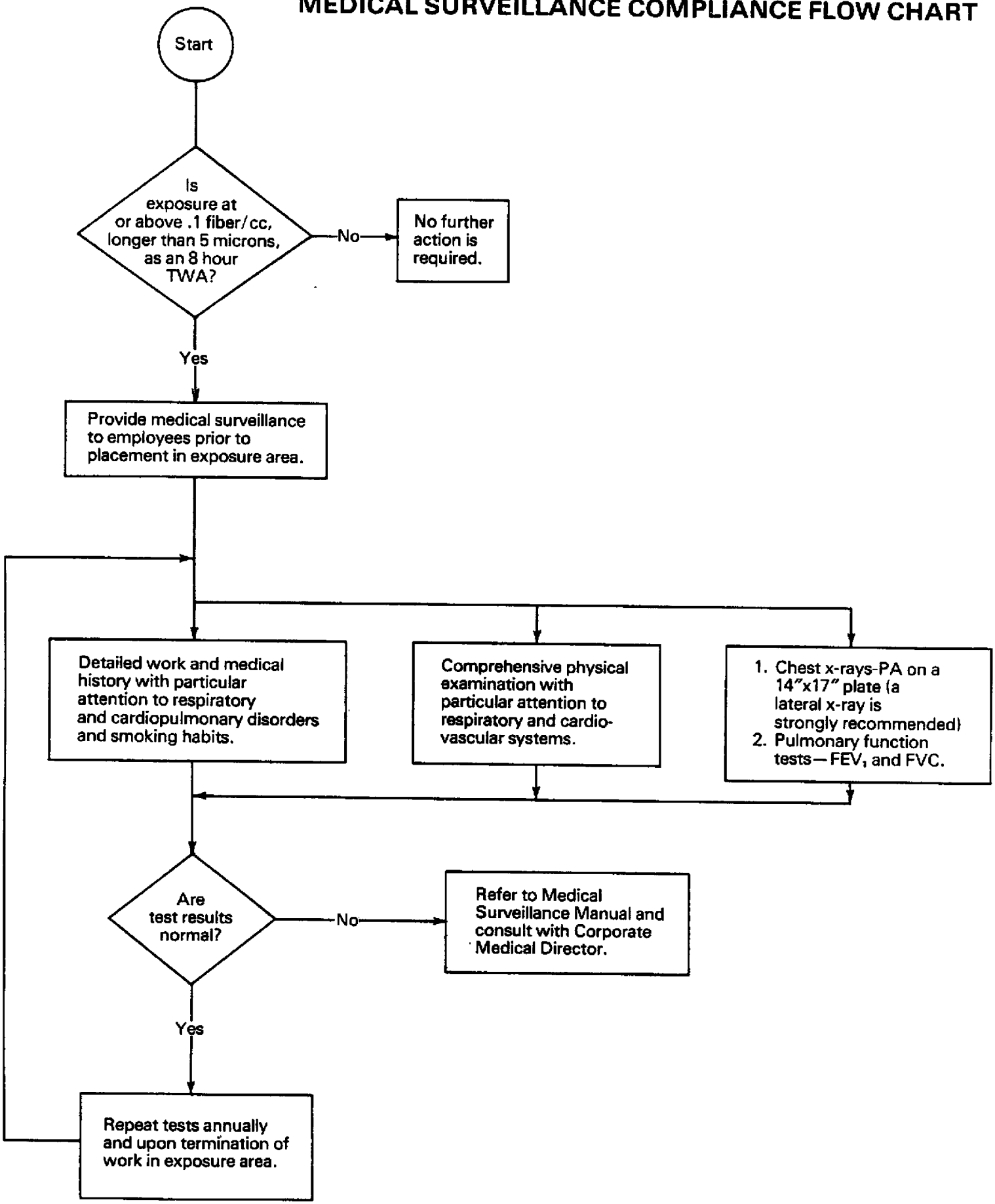
b. The proper shipping name and hazard class, i.e., Asbestos ORM-C (49 CFR 172.202).

c. If shipped on the same bill of lading with non-hazardous materials, the asbestos entry should be before any non-hazardous entries or in a contrasting color (highlighted)(49 CFR 172.201).

d. A signed certification (49 CFR 172.204).

There are no shipping paper requirements when commercial asbestos is shipped via truck or rail modes (49 CFR 172.200).

FEDERAL ASBESTOS STANDARD
MEDICAL SURVEILLANCE COMPLIANCE FLOW CHART



ASBESTOS MANUAL

November 9, 1979

The Firestone Tire & Rubber Company

CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

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CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

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The signs must display a legend which is described in paragraph (g)(1)(ii) of this standard.

Since during the short time needed for a demolition or removal of asbestos insulation it is not usually possible to determine if the concentration of airborne fibers is above or below the permissible exposure limits, caution signs should be posted at all asbestos removal operations. These signs should be removed after the work is completed.

Caution labels must 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 no airborne concentrations of asbestos fibers in excess of the permissible exposure limits will be released.

The statement that is required on the label is described in paragraph (g)(2)(ii) of this standard.

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All external surfaces in any place of employment must be maintained free of accumulations of asbestos fibers. Collection of settled dust or debris should be done by vacuum cleaning. Do not clean up asbestos by blowing or dry sweeping.

Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, that is to be disposed of, must be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

The federal regulations pertaining to asbestos waste disposal practices and procedures are described in the next section of the manual under US-EPA Regulations.

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The standard requires that the employer provide or make available at his cost medical examinations to each of his employees exposed to asbestos fibers. The medical examinations program required by OSHA is presented below (this is a copy of the medical surveillance program for asbestos which has been adopted by the Corporate Medical Department).

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A. Reason for medical surveillance

1. Required by the OSHA asbestos standard (29 CFR 1910.1001(j))

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2. Amosite

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4. Tremolite
5. Anthophyllite
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Note: This definition of exposure has been established by OSHA Program Directive 300-16, effective October 11, 1978, and will not be found in the original OSHA asbestos standard.

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1. Detailed work and medical history with particular attention to

a. Respiratory and cardiopulmonary disorders
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2. Comprehensive physical examination with particular attention to respiratory and cardiovascular systems

3. Chest x-rays - PA on 14" x 17" plate (a lateral x-ray is also strongly recommended)

4. Pulmonary function tests - FEV_1 and FVC

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b. At least annually while working in the exposure area

c. Within 30 days before or after termination of employment in an exposure area unless all the tests and procedures have been performed within the past year

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2. In order to unify and standardize the pulmonary function tests, the actual administration of the tests should be done by as few people as possible. The original tracing and interpretation should be given to the plant physician for medical management. A copy of each should be sent to the Corporate Medical Department for short and long term interpretation, study, and storage.

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4. Any abnormality in the chest x-rays as compared to established norms or earlier findings, a definite reduction in the FEV_1 or FVC, or degeneration of the employee's general respiratory condition should be reasons for not employing or for removing the employee from the asbestos exposure area.

5. The responsibility for medical removal and reinstatement is that of the plant physician in consultation with as many other physicians as he deems necessary.

6. Medical records of employees examined under this protocol, including examination and test results, written medical opinions, and records of employee complaints, should be retained for at least five years after the last employment for each employee, or for twenty years from the date of the record, whichever is longer.

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The US-EPA has established emission standards for certain hazardous air pollutants under its National Emission Standards for Hazardous Air Pollutants Regulations (NESHAPS). Asbestos is included as one of the four substances currently regulated under these regulations (40 CFR Part 61, Subpart B).

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These regulations (i.e., NESHAPS) for controlling asbestos emissions were first promulgated on April 6, 1973 (38 FR 8820) in fulfilling requirements under Section 112 (B) of the Clean Air Act, as amended December 1970. Since then they have undergone various revisions, the most recent of which was promulgated February 7, 1979, giving the State of Texas authority to administer the NESHAPS program and issue permits, etc. in the state.

From time to time additional pollutants which are found to be hazardous[1] will be included under EPA NESHAPS regulations (i.e., vinyl chloride was added to the original list on October 21, 1976, 41 FR 46560).

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A source can use a specified method of air cleaning (fabric filter systems, etc.) to eliminate such emissions, provided that the emission control equipment is approved by the administrator of the US-EPA or his authorized representative.

Specifically the asbestos standards are:

1. There shall be no visible emissions to the outside air from any asbestos mill, except when a specified method of air cleaning, also part of these standards, is used before the emissions escape to the outside air. In general, these air-cleaning systems filter asbestos emissions to the point that visible emissions would not be produced anyway.

2. The surfacing of roadways with asbestos tailings is prohibited, except for temporary roadways in an area of asbestos ore deposits.

3. There shall be no visible emissions to the outside air, unless the specified air cleaning methods are used, from any operation which manufacturers: cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, other textile products, cement products, fireproofing and insulating materials, friction products, paper, millboard, felt, floor tile, paints, coatings, caulks, adhesives, sealants, plastics and rubber materials, and chlorine.

4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

c. No asbestos debris shall be dropped or thrown to the ground or from one floor to another. For buildings 50 feet or greater in height, asbestos debris shall be lowered to the ground via dust-tight chutes or containers.

d. Written notice of intention to demolish shall be provided to the US-EPA Regional Administrator at least 10 days prior to commencement of demolition. This notice shall include items under Section 61.22(d)(2) of this regulation.

e. Certain demolition operations are exempt from the regulations, except for the wetting of asbestos debris and the notification requirement, if a building has been declared to be structurally unsound and in danger of imminent collapse.

f. Asbestos waste shall be sealed in leak-tight containers while wet, prior to being sent to an approved waste disposal site.

g. The leak-tight containers (Item f) should be labeled with a warning label which reads:

CAUTION

Contains Asbestos

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

h. The owner or operator of a demolition operation is exempted from these requirements, with the exception of Item d above, provided the amount of friable asbestos materials in the building or portion thereof to be demolished is less than 80 meters (ca. 260 feet) used on pipes, and less than 15 square meters (ca. 160 square feet) used on any duct, boiler, tank, reactor, turbine, furnace, or structural member.

These regulations also set forth collection, processing, and disposal requirements which the waste disposal firm must adhere to in handling and disposing of this waste (40 CFR 61.25). Since Firestone in most cases, if not all, will be utilizing outside firms for disposal of its asbestos wastes, no further

discussion of these requirements will be presented herein. Firestone, however, must verify that any firm selected to dispose of its asbestos waste will meet the requirements of paragraph 61.25 (i.e., approved operation).

Following is Section 61.22(d)(2) of the Emission standard:

> Written notice of intention to demolish or renovate shall be provided to the Administrator by the owner or operator of the demolition or renovation operation. Such notice shall be postmarked or delivered to the Administrator at least 10 days prior to commencement of demolition, or as early as possible prior to commencement of emergency demolition subject to paragraph (d)(6) of this section, and as early as possible prior to commencement of renovation. Such notice shall include the following information:
>
> (i) Name of owner or operator.
>
> (ii) Address of owner or operator.
>
> (iii) Description of the building, structure, facility, or installation to be demolished or renovated, including the size, age, and prior use of the structure, and the approximate amount of friable asbestos materials present.
>
> (iv) Address or location of the building, structure, facility, or installation.
>
> (v) Scheduled starting and completion dates of demolition or renovation.
>
> (vi) Nature of planned demolition or renovation and method(s) to be employed.
>
> (vii) Procedures to be employed to meet the requirements of this paragraph and paragraph (j) of this section.
>
> (viii) The name and address or location of the waste disposal site where the friable asbestos waste will be deposited.
>
> (ix) Name, title, and authority of the State or local governmental representative who has ordered a demolition which is subject to paragraph (d)(6) of this section.

III. DEPARTMENT OF TRANSPORTATION REGULATIONS

The Department of Transportation (DOT) currently regulates only the transportation of commercial asbestos. They do not regulate:

1. Asbestos which has no commercial value, such as products which contain trace amounts as a contaminant (49 CFR 173.1090(c)).

2. Waste asbestos which is currently proposed to be regulated under DOT hazardous waste regulations (preamble to final commercial asbestos rule issued December 4, 1978).

3. Asbestos which is immersed or fixed in a natural or artificial binder material such as cement, plastic, asphalt, resin, or mineral ore (49 CFR 173.1090(c)).

DOT does regulate commercial asbestos which is defined as any material or product which has commercial value because of its asbestos content (49 CFR 173.1090(a)).

When regulated, DOT requires that shipments of asbestos meet the following requirements:

1. Packaging must be as specified in 49 CFR 173.1090(d):

   a. Leak-tight packages such as metal or fiber drums.

   b. Bags which are dust and sift proof and are unitized on a pallet. Pallet loads should be encased in a shrink wrapped plastic film or fiberboard secured by strapping.

   c. Bags placed inside wooden or fiberboard boxes.

2. Each outside package must be marked with the word "Asbestos" and the name and address of the consignee or consignor (49 CFR 173.304 and 173.306).

3. Each outside container must be marked "ORM-C" in an appropriate rectangle (49 CFR 172.316). Labels which can be used for this purpose are available through normal Firestone stationery store channels. The form number and description for ordering purposes is "S-8974, ORM-C Label".

4. Asbestos shipped via the water or air mode must also meet the following shipping paper requirements (49 CFR 172.200):

a. The total amount of commercial asbestos being shipped, i.e., the net weight of the product containing commercial asbestos (49 CFR 172.202).

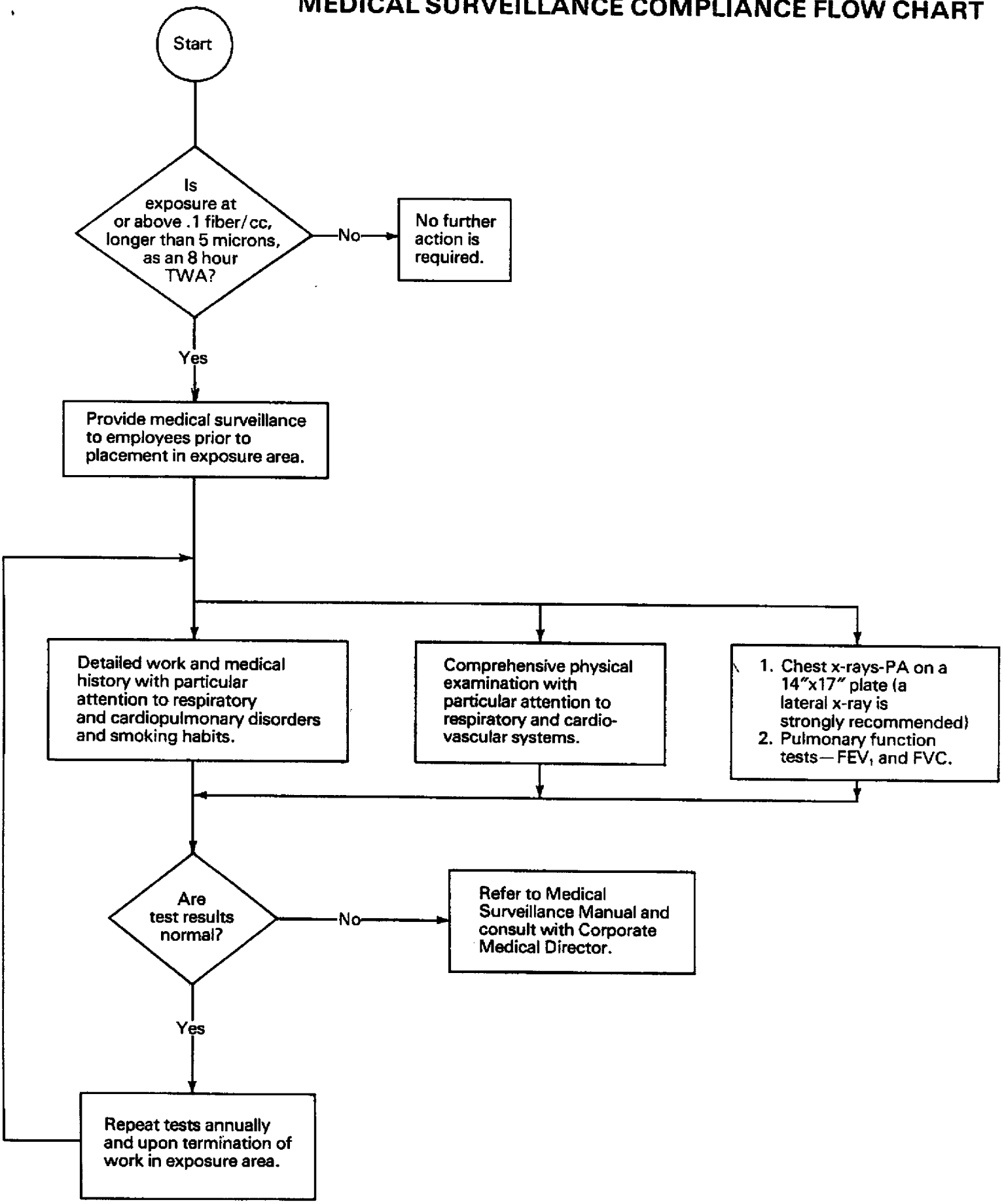
b. The proper shipping name and hazard class, i.e., Asbestos ORM-C (49 CFR 172.202).

c. If shipped on the same bill of lading with non-hazardous materials, the asbestos entry should be before any non-hazardous entries or in a contrasting color (highlighted)(49 CFR 172.201).

d. A signed certification (49 CFR 172.204).

There are no shipping paper requirements when commercial asbestos is shipped via truck or rail modes (49 CFR 172.200).

FEDERAL ASBESTOS STANDARD
MEDICAL SURVEILLANCE COMPLIANCE FLOW CHART



ASBESTOS MANUAL

November 9, 1979

The Firestone Tire & Rubber Company

CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

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CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

INTRODUCTION

Asbestos and materials containing asbestos are now regulated by several federal regulatory agencies. The purpose of this manual is to compile in one document all applicable federal regulations and assist and guide the plants in complying with these regulations.

The use of asbestos or materials containing asbestos in our plants is now very limited. According to the information that we have available, asbestos insulation may still be used or found in the following areas:

Tire Plants

1. Curing area.
   a. Old pipe insulation.
   b. Curing press heat shields.
   c. Board type asbestos insulation between press platens or domes and in the curing press frame. This asbestos material is cut or machined by the McNeil Company or NRM and is only installed by Firestone people.
   d. Pipe insulation installed by McNeil or NRM on new presses that are shipped to Firestone plants.
   e. NRM well insulation.
2. Powerhouse - Plants ten years old or older.
   a. Pipe insulation.
   b. Deaerator heater.
3. Maintenance.
   a. Gaskets made from a material containing asbestos.
   b. Welding blankets or guards.
4. Tire building - Hot knife boxes.
   a. 99R3 TAM - Asbestos tubing 1.5" o.d. - 1.25" i.d. x 1" long, two per machine. This tubing insulates the heated magnets from the rest of the assembly.

      Asbestos tape 0.5" wide x 15" long, four per machine. This tape is wrapped around the heating elements and tubing described above.

b. All Radial First Stage TAM's. Radial sidewall knife - Heat sink hot box. Manganese-nickel wire with asbestos-glass insulation AWG 14, 16" required per machine.

All Other Plants

1. Gaskets made from a material containing asbestos that are cut to size and drilled to open holes.

2. Experimental formulation of small batches of rubber products containing asbestos. This is done in an Akron laboratory of the Synthetic Rubber Division.

Maintenance operations in plants often require the removal or demolition of old asbestos insulation. The removal of asbestos insulation is of considerable importance from the standpoint of compliance with federal regulations since the potential of employee exposure to airborne asbestos fibers is usually higher than in other operations.

The manual is divided into three sections. The first section describes the OSHA standard on asbestos. The second section describes the EPA regulations on asbestos which are applicable to Firestone operations. The third section summarizes the current Department of Transportation regulations on asbestos.

I. OSHA REGULATION SECTION 1910.1001

The OSHA standard on asbestos is described in Section 1910.1001 of the OSHA standards book.

Permissible Average Exposure Limit and Ceiling Concentration

The present 8-hour time-weighted average permissible exposure limit is two (2) fibers, longer than 5 microns, per cubic centimeter of air.

The permissible ceiling exposure limit is ten (10) fibers, longer than 5 microns, per cubic centimeter of air, as determined over a period of 15 minutes.

Air Monitoring and Sampling Frequency

All operations where asbestos and materials containing asbestos are being used or old asbestos insulation is being removed, replaced, or repaired must be monitored by air sampling to determine employee exposure to airborne asbestos fibers.

Samples should be collected from within the breathing zone of the employees on membrane filters mounted in an open face filter holder (cassette). Samples should be taken for the determination of the 8-hour time-weighted average concentration and of the ceiling concentration of asbestos fibers.

Cassettes for collecting air samples for asbestos are provided to the plants by the Industrial Hygiene Department. After sampling, these cassettes are returned to Industrial Hygiene for analysis and calculation of the airborne concentration of asbestos fibers. Detailed instructions on how to collect air samples for asbestos have been sent to the plant safety engineers by the Industrial Hygiene Department.

After the initial determination, samples should be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees to asbestos fibers. In no case should the sampling be done at intervals greater than 6 months for employees whose exposure to asbestos exceeds the permissible exposure limit or the permissible ceiling concentration.

Affected employees, or their representatives, should be given an opportunity to observe the monitoring operation.

Employee Notification and Recordkeeping of Exposure Results

Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the permissible exposure limit or the permissible ceiling concentration must be notified in writing of the exposure as soon as practicable but not later than 5 days of the finding. The employee must also be timely notified of the corrective action taken to reduce the airborne concentration of asbestos fibers.

Every employer must maintain records of any personal or environmental monitoring required by Section 1910.1001. Records must be maintained for a period of at least 20 years and must be made available upon request to the Assistant Secretary of Labor for OSHA, the Director of NIOSH, and to their authorized representatives.

Every employee and former employee shall have reasonable access to any records required to be maintained by this standard, which indicate the employee's own exposure to asbestos fibers.

Methods of Compliance

1. Particular Tools

   All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits listed above, such as saws, scorers, abrasive wheels, and drills, must be provided with local exhaust ventilation systems.

2. Wet Methods

   Insofar as practicable, asbestos must 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 permissible exposure limits, unless the usefulness of the product would be diminished by wetting it.

Spraying, Demolition, or Removal of Asbestos Insulation

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 must be provided with respiratory protective equipment and special clothing as described below.

Respiratory Protective Equipment

1. Air Purifying respirators

   A reusable or single use (disposable) air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 2 but not greater than 20 fibers per cubic centimeter of air.

2. Powered Air Purifying Respirator

   A powered air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 20 but not greater than 200 fibers per cubic centimeter of air.

3. Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type

   A type C continuous flow or pressure-demand supplied-air respirator must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 200 fibers per cubic centimeter of air.

The OSHA standard specifies that employees engaged in the removal or demolition of asbestos insulation shall be provided with supplied-air respirators. For the removal of large sections of insulation which would normally last several days, a supplied-air respirator must be provided. As a general guideline, when the amount of asbestos to be removed is small and the operation will only last a few hours or less, a supplied-air respirator should still be provided if feasible. If this is not feasible, at least an air purifying respirator should be provided.

Special Clothing - Clothes Lockers - Laundering

The employer must 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 permissible exposure limits, or who is engaged in the removal or demolition of asbestos insulation.

At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the permissible exposure limits, the employer must provide change rooms for employees working regularly at the place.

The employer must 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.

Laundering of asbestos contaminated clothing must be done so as to prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Any employer who gives asbestos contaminated clothing to another person for laundering must inform such person of the requirement to effectively prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Contaminated clothing must be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with paragraph (g)(2)(ii) of the standard.

It is now common practice among employers to provide their employees who are engaged in asbestos insulation removal with disposable coveralls, head coverings and shoe coverings. The use of disposable protective clothing eliminates the necessity of laundering work clothes contaminated with asbestos and all other problems associated with it.

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4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

c. No asbestos debris shall be dropped or thrown to the ground or from one floor to another. For buildings 50 feet or greater in height, asbestos debris shall be lowered to the ground via dust-tight chutes or containers.

d. Written notice of intention to demolish shall be provided to the US-EPA Regional Administrator at least 10 days prior to commencement of demolition. This notice shall include items under Section 61.22(d)(2) of this regulation.

e. Certain demolition operations are exempt from the regulations, except for the wetting of asbestos debris and the notification requirement, if a building has been declared to be structurally unsound and in danger of imminent collapse.

f. Asbestos waste shall be sealed in leak-tight containers while wet, prior to being sent to an approved waste disposal site.

g. The leak-tight containers (Item f) should be labeled with a warning label which reads:

CAUTION

Contains Asbestos

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

h. The owner or operator of a demolition operation is exempted from these requirements, with the exception of Item d above, provided the amount of friable asbestos materials in the building or portion thereof to be demolished is less than 80 meters (ca. 260 feet) used on pipes, and less than 15 square meters (ca. 160 square feet) used on any duct, boiler, tank, reactor, turbine, furnace, or structural member.

These regulations also set forth collection, processing, and disposal requirements which the waste disposal firm must adhere to in handling and disposing of this waste (40 CFR 61.25). Since Firestone in most cases, if not all, will be utilizing outside firms for disposal of its asbestos wastes, no further

discussion of these requirements will be presented herein. Firestone, however, must verify that any firm selected to dispose of its asbestos waste will meet the requirements of paragraph 61.25 (i.e., approved operation).

Following is Section 61.22(d)(2) of the Emission standard:

> Written notice of intention to demolish or renovate shall be provided to the Administrator by the owner or operator of the demolition or renovation operation. Such notice shall be postmarked or delivered to the Administrator at least 10 days prior to commencement of demolition, or as early as possible prior to commencement of emergency demolition subject to paragraph (d)(6) of this section, and as early as possible prior to commencement of renovation. Such notice shall include the following information:
>
> (i) Name of owner or operator.
>
> (ii) Address of owner or operator.
>
> (iii) Description of the building, structure, facility, or installation to be demolished or renovated, including the size, age, and prior use of the structure, and the approximate amount of friable asbestos materials present.
>
> (iv) Address or location of the building, structure, facility, or installation.
>
> (v) Scheduled starting and completion dates of demolition or renovation.
>
> (vi) Nature of planned demolition or renovation and method(s) to be employed.
>
> (vii) Procedures to be employed to meet the requirements of this paragraph and paragraph (j) of this section.
>
> (viii) The name and address or location of the waste disposal site where the friable asbestos waste will be deposited.
>
> (ix) Name, title, and authority of the State or local governmental representative who has ordered a demolition which is subject to paragraph (d)(6) of this section.

III. DEPARTMENT OF TRANSPORTATION REGULATIONS

The Department of Transportation (DOT) currently regulates only the transportation of commercial asbestos. They do not regulate:

1. Asbestos which has no commercial value, such as products which contain trace amounts as a contaminant (49 CFR 173.1090(c)).

2. Waste asbestos which is currently proposed to be regulated under DOT hazardous waste regulations (preamble to final commercial asbestos rule issued December 4, 1978).

3. Asbestos which is immersed or fixed in a natural or artificial binder material such as cement, plastic, asphalt, resin, or mineral ore (49 CFR 173.1090(c)).

DOT does regulate commercial asbestos which is defined as any material or product which has commercial value because of its asbestos content (49 CFR 173.1090(a)).

When regulated, DOT requires that shipments of asbestos meet the following requirements:

1. Packaging must be as specified in 49 CFR 173.1090(d):

   a. Leak-tight packages such as metal or fiber drums.

   b. Bags which are dust and sift proof and are unitized on a pallet. Pallet loads should be encased in a shrink wrapped plastic film or fiberboard secured by strapping.

   c. Bags placed inside wooden or fiberboard boxes.

2. Each outside package must be marked with the word "Asbestos" and the name and address of the consignee or consignor (49 CFR 173.304 and 173.306).

3. Each outside container must be marked "ORM-C" in an appropriate rectangle (49 CFR 172.316). Labels which can be used for this purpose are available through normal Firestone stationery store channels. The form number and description for ordering purposes is "S-8974, ORM-C Label".

4. Asbestos shipped via the water or air mode must also meet the following shipping paper requirements (49 CFR 172.200):

a. The total amount of commercial asbestos being shipped, i.e., the net weight of the product containing commercial asbestos (49 CFR 172.202).

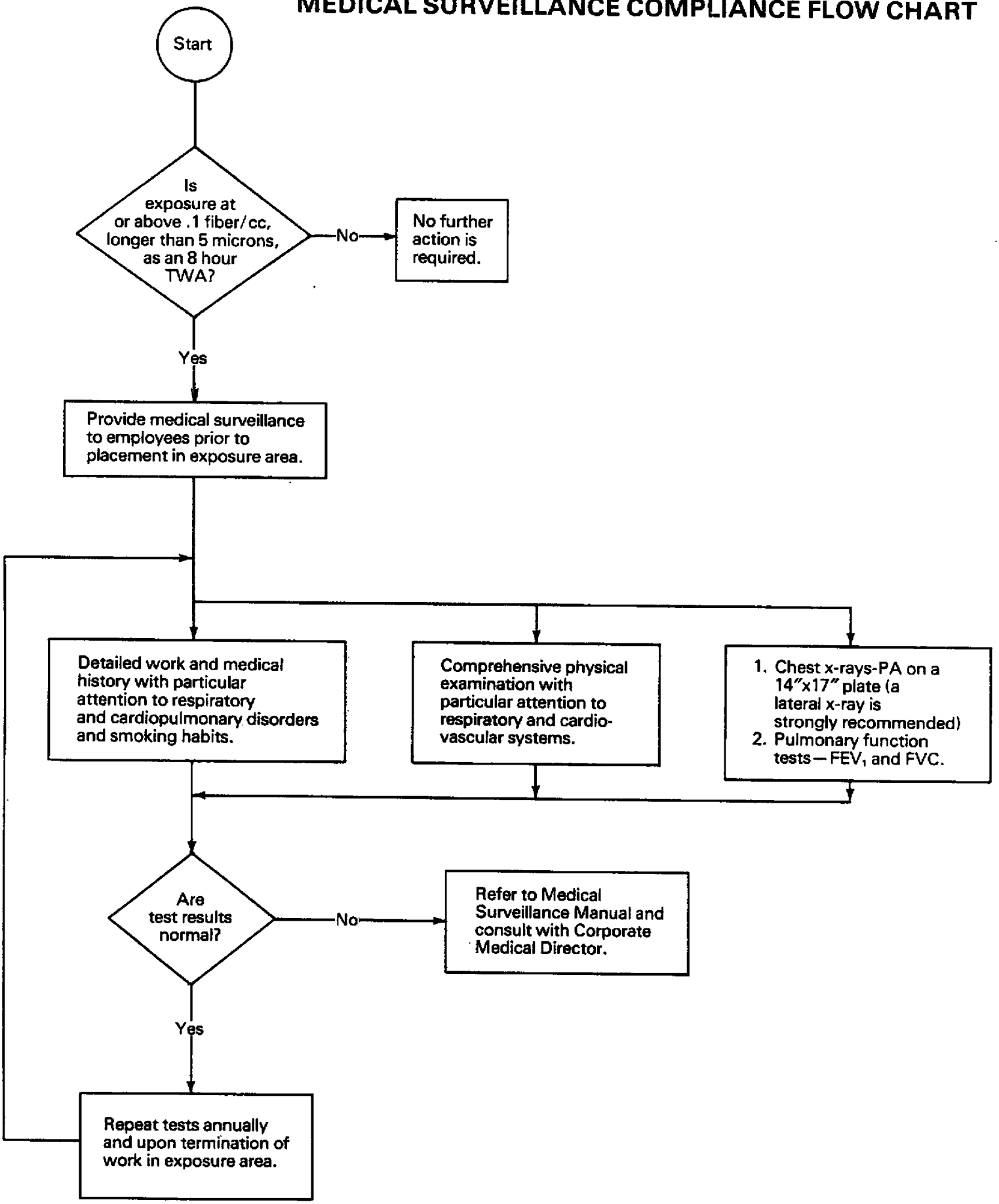
b. The proper shipping name and hazard class, i.e., Asbestos ORM-C (49 CFR 172.202).

c. If shipped on the same bill of lading with non-hazardous materials, the asbestos entry should be before any non-hazardous entries or in a contrasting color (highlighted)(49 CFR 172.201).

d. A signed certification (49 CFR 172.204).

There are no shipping paper requirements when commercial asbestos is shipped via truck or rail modes (49 CFR 172.200).

FEDERAL ASBESTOS STANDARD
MEDICAL SURVEILLANCE COMPLIANCE FLOW CHART



ASBESTOS MANUAL

November 9, 1979

The Firestone Tire & Rubber Company

CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

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CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

INTRODUCTION

Asbestos and materials containing asbestos are now regulated by several federal regulatory agencies. The purpose of this manual is to compile in one document all applicable federal regulations and assist and guide the plants in complying with these regulations.

The use of asbestos or materials containing asbestos in our plants is now very limited. According to the information that we have available, asbestos insulation may still be used or found in the following areas:

Tire Plants

1. Curing area.
   a. Old pipe insulation.
   b. Curing press heat shields.
   c. Board type asbestos insulation between press platens or domes and in the curing press frame. This asbestos material is cut or machined by the McNeil Company or NRM and is only installed by Firestone people.
   d. Pipe insulation installed by McNeil or NRM on new presses that are shipped to Firestone plants.
   e. NRM well insulation.
2. Powerhouse - Plants ten years old or older.
   a. Pipe insulation.
   b. Deaerator heater.
3. Maintenance.
   a. Gaskets made from a material containing asbestos.
   b. Welding blankets or guards.
4. Tire building - Hot knife boxes.
   a. 99R3 TAM - Asbestos tubing 1.5" o.d. - 1.25" i.d. x 1" long, two per machine. This tubing insulates the heated magnets from the rest of the assembly.

      Asbestos tape 0.5" wide x 15" long, four per machine. This tape is wrapped around the heating elements and tubing described above.

b. All Radial First Stage TAM's. Radial sidewall knife - Heat sink hot box. Manganese-nickel wire with asbestos-glass insulation AWG 14, 16" required per machine.

All Other Plants

1. Gaskets made from a material containing asbestos that are cut to size and drilled to open holes.

2. Experimental formulation of small batches of rubber products containing asbestos. This is done in an Akron laboratory of the Synthetic Rubber Division.

Maintenance operations in plants often require the removal or demolition of old asbestos insulation. The removal of asbestos insulation is of considerable importance from the standpoint of compliance with federal regulations since the potential of employee exposure to airborne asbestos fibers is usually higher than in other operations.

The manual is divided into three sections. The first section describes the OSHA standard on asbestos. The second section describes the EPA regulations on asbestos which are applicable to Firestone operations. The third section summarizes the current Department of Transportation regulations on asbestos.

I. OSHA REGULATION SECTION 1910.1001

The OSHA standard on asbestos is described in Section 1910.1001 of the OSHA standards book.

Permissible Average Exposure Limit and Ceiling Concentration

The present 8-hour time-weighted average permissible exposure limit is two (2) fibers, longer than 5 microns, per cubic centimeter of air.

The permissible ceiling exposure limit is ten (10) fibers, longer than 5 microns, per cubic centimeter of air, as determined over a period of 15 minutes.

Air Monitoring and Sampling Frequency

All operations where asbestos and materials containing asbestos are being used or old asbestos insulation is being removed, replaced, or repaired must be monitored by air sampling to determine employee exposure to airborne asbestos fibers.

Samples should be collected from within the breathing zone of the employees on membrane filters mounted in an open face filter holder (cassette). Samples should be taken for the determination of the 8-hour time-weighted average concentration and of the ceiling concentration of asbestos fibers.

Cassettes for collecting air samples for asbestos are provided to the plants by the Industrial Hygiene Department. After sampling, these cassettes are returned to Industrial Hygiene for analysis and calculation of the airborne concentration of asbestos fibers. Detailed instructions on how to collect air samples for asbestos have been sent to the plant safety engineers by the Industrial Hygiene Department.

After the initial determination, samples should be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees to asbestos fibers. In no case should the sampling be done at intervals greater than 6 months for employees whose exposure to asbestos exceeds the permissible exposure limit or the permissible ceiling concentration.

Affected employees, or their representatives, should be given an opportunity to observe the monitoring operation.

Employee Notification and Recordkeeping of Exposure Results

Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the permissible exposure limit or the permissible ceiling concentration must be notified in writing of the exposure as soon as practicable but not later than 5 days of the finding. The employee must also be timely notified of the corrective action taken to reduce the airborne concentration of asbestos fibers.

Every employer must maintain records of any personal or environmental monitoring required by Section 1910.1001. Records must be maintained for a period of at least 20 years and must be made available upon request to the Assistant Secretary of Labor for OSHA, the Director of NIOSH, and to their authorized representatives.

Every employee and former employee shall have reasonable access to any records required to be maintained by this standard, which indicate the employee's own exposure to asbestos fibers.

Methods of Compliance

1. Particular Tools

   All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits listed above, such as saws, scorers, abrasive wheels, and drills, must be provided with local exhaust ventilation systems.

2. Wet Methods

   Insofar as practicable, asbestos must 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 permissible exposure limits, unless the usefulness of the product would be diminished by wetting it.

Spraying, Demolition, or Removal of Asbestos Insulation

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 must be provided with respiratory protective equipment and special clothing as described below.

Respiratory Protective Equipment

1. Air Purifying respirators

A reusable or single use (disposable) air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 2 but not greater than 20 fibers per cubic centimeter of air.

2. Powered Air Purifying Respirator

A powered air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 20 but not greater than 200 fibers per cubic centimeter of air.

3. Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type

A type C continuous flow or pressure-demand supplied-air respirator must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 200 fibers per cubic centimeter of air.

The OSHA standard specifies that employees engaged in the removal or demolition of asbestos insulation shall be provided with supplied-air respirators. For the removal of large sections of insulation which would normally last several days, a supplied-air respirator must be provided. As a general guideline, when the amount of asbestos to be removed is small and the operation will only last a few hours or less, a supplied-air respirator should still be provided if feasible. If this is not feasible, at least an air purifying respirator should be provided.

Special Clothing - Clothes Lockers - Laundering

The employer must 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 permissible exposure limits, or who is engaged in the removal or demolition of asbestos insulation.

At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the permissible exposure limits, the employer must provide change rooms for employees working regularly at the place.

The employer must 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.

Laundering of asbestos contaminated clothing must be done so as to prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Any employer who gives asbestos contaminated clothing to another person for laundering must inform such person of the requirement to effectively prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Contaminated clothing must be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with paragraph (g)(2)(ii) of the standard.

It is now common practice among employers to provide their employees who are engaged in asbestos insulation removal with disposable coveralls, head coverings and shoe coverings. The use of disposable protective clothing eliminates the necessity of laundering work clothes contaminated with asbestos and all other problems associated with it.

Caution Signs and Caution Labels

Caution signs must be provided and displayed at each location where airborne concentrations of asbestos fibers may exceed the permissible exposure limits. Signs must 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 must be posted at all approaches to areas containing excessive concentrations of asbestos fibers.

The signs must display a legend which is described in paragraph (g)(1)(ii) of this standard.

Since during the short time needed for a demolition or removal of asbestos insulation it is not usually possible to determine if the concentration of airborne fibers is above or below the permissible exposure limits, caution signs should be posted at all asbestos removal operations. These signs should be removed after the work is completed.

Caution labels must 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 no airborne concentrations of asbestos fibers in excess of the permissible exposure limits will be released.

The statement that is required on the label is described in paragraph (g)(2)(ii) of this standard.

Housekeeping - Waste Disposal

All external surfaces in any place of employment must be maintained free of accumulations of asbestos fibers. Collection of settled dust or debris should be done by vacuum cleaning. Do not clean up asbestos by blowing or dry sweeping.

Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, that is to be disposed of, must be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

The federal regulations pertaining to asbestos waste disposal practices and procedures are described in the next section of the manual under US-EPA Regulations.

Medical Examinations

The standard requires that the employer provide or make available at his cost medical examinations to each of his employees exposed to asbestos fibers. The medical examinations program required by OSHA is presented below (this is a copy of the medical surveillance program for asbestos which has been adopted by the Corporate Medical Department).

ASBESTOS

A. Reason for medical surveillance

1. Required by the OSHA asbestos standard (29 CFR 1910. 1001 (j))

B. Forms of asbestos included

1. Chrysotile
2. Amosite

3. Crocidolite
4. Tremolite
5. Anthophyllite
6. Actinolite

C. Level of exposure

1. Airborne exposure to asbestos at or above 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

Note: This definition of exposure has been established by OSHA Program Directive 300-16, effective October 11, 1978, and will not be found in the original OSHA asbestos standard.

D. Types of medical tests and procedures

1. Detailed work and medical history with particular attention to

a. Respiratory and cardiopulmonary disorders
b. Smoking habits

2. Comprehensive physical examination with particular attention to respiratory and cardiovascular systems

3. Chest x-rays - PA on 14" x 17" plate (a lateral x-ray is also strongly recommended)

4. Pulmonary function tests - FEV_1 and FVC

E. Frequency of medical tests and procedures

1. All tests and procedures

a. Prior to or within 30 days after placement in an exposure area where airborne asbestos levels exceed 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

b. At least annually while working in the exposure area

c. Within 30 days before or after termination of employment in an exposure area unless all the tests and procedures have been performed within the past year

F. Interpretation of medical tests and procedures

1. Chest x-rays should be interpreted by a radiologist

2. In order to unify and standardize the pulmonary function tests, the actual administration of the tests should be done by as few people as possible. The original tracing and interpretation should be given to the plant physician for medical management. A copy of each should be sent to the Corporate Medical Department for short and long term interpretation, study, and storage.

3. Whenever an employee shows signs or symptoms of chronic non-malignant or malignant lung disease or cardiopulmonary disorders which may be due to occupational exposure to asbestos, the Corporate Medical Department should be consulted.

4. Any abnormality in the chest x-rays as compared to established norms or earlier findings, a definite reduction in the FEV_1 or FVC, or degeneration of the employee's general respiratory condition should be reasons for not employing or for removing the employee from the asbestos exposure area.

5. The responsibility for medical removal and reinstatement is that of the plant physician in consultation with as many other physicians as he deems necessary.

6. Medical records of employees examined under this protocol, including examination and test results, written medical opinions, and records of employee complaints, should be retained for at least five years after the last employment for each employee, or for twenty years from the date of the record, whichever is longer.

II. US-EPA REGULATION

Introduction

The US-EPA has established emission standards for certain hazardous air pollutants under its National Emission Standards for Hazardous Air Pollutants Regulations (NESHAPS). Asbestos is included as one of the four substances currently regulated under these regulations (40 CFR Part 61, Subpart B).

The NESHAPS regulations are applicable to the following operations:

a) asbestos mills
b) roadways
c) manufacturing
d) demolition and renovation
e) spraying
f) fabricating
g) insulating
h) waste disposal

Based upon Environmental Engineering's knowledge, Firestone is mainly involved in Items (d) and (h) above.

US-EPA intentions are to administer these regulations on a state by state basis by delegating authority to the individual state air control agencies (i.e., once they have met all the necessary requirements). To date, 31 states have been given this authority as follows: Alabama, Arizona, California, Colorado, Connecticut, Delaware, Georgia, Indiana, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, Texas, Vermont, Virginia, Washington, Wisconsin, Puerto Rico, and U. S. Virgin Islands.

These regulations (i.e., NESHAPS) for controlling asbestos emissions were first promulgated on April 6, 1973 (38 FR 8820) in fulfilling requirements under Section 112 (B) of the Clean Air Act, as amended December 1970. Since then they have undergone various revisions, the most recent of which was promulgated February 7, 1979, giving the State of Texas authority to administer the NESHAPS program and issue permits, etc. in the state.

From time to time additional pollutants which are found to be hazardous[1] will be included under EPA NESHAPS regulations (i.e., vinyl chloride was added to the original list on October 21, 1976, 41 FR 46560).

[1]May cause, or contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness - Clean Air Act, Section 112(1), December 1970.

Reason for Control of Asbestos Emissions

A large number of studies have shown an association between occupational exposure to asbestos and a higher than expected incidence of bronchial cancer. Asbestos also has been identified as a causal factor in the development of cancers of the membranes of the chest and abdomen.

Emission Standard for Asbestos

Basically the regulations prohibit any discharge of asbestos to the outside air which creates a visible emission which may be detected without the aid of instruments. By definition, outside air means the air outside buildings or structures.

A source can use a specified method of air cleaning (fabric filter systems, etc.) to eliminate such emissions, provided that the emission control equipment is approved by the administrator of the US-EPA or his authorized representative.

Specifically the asbestos standards are:

1. There shall be no visible emissions to the outside air from any asbestos mill, except when a specified method of air cleaning, also part of these standards, is used before the emissions escape to the outside air. In general, these air-cleaning systems filter asbestos emissions to the point that visible emissions would not be produced anyway.

2. The surfacing of roadways with asbestos tailings is prohibited, except for temporary roadways in an area of asbestos ore deposits.

3. There shall be no visible emissions to the outside air, unless the specified air cleaning methods are used, from any operation which manufacturers: cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, other textile products, cement products, fireproofing and insulating materials, friction products, paper, millboard, felt, floor tile, paints, coatings, caulks, adhesives, sealants, plastics and rubber materials, and chlorine.

4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

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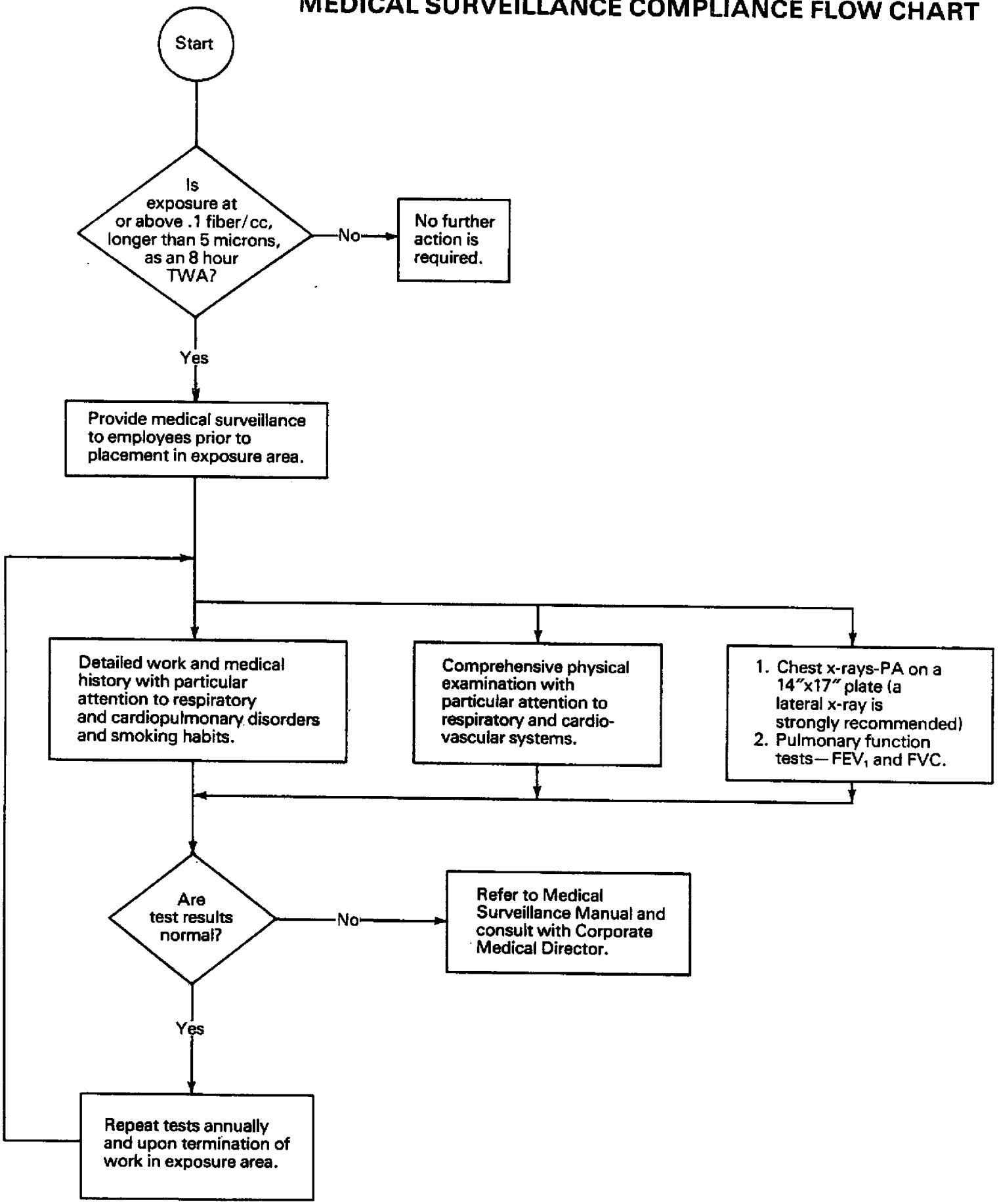
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d. A signed certification (49 CFR 172.204).

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CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

BATO/JACKSON 049783

CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

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Asbestos and materials containing asbestos are now regulated by several federal regulatory agencies. The purpose of this manual is to compile in one document all applicable federal regulations and assist and guide the plants in complying with these regulations.

The use of asbestos or materials containing asbestos in our plants is now very limited. According to the information that we have available, asbestos insulation may still be used or found in the following areas:

Tire Plants

1. Curing area.
   a. Old pipe insulation.
   b. Curing press heat shields.
   c. Board type asbestos insulation between press platens or domes and in the curing press frame. This asbestos material is cut or machined by the McNeil Company or NRM and is only installed by Firestone people.
   d. Pipe insulation installed by McNeil or NRM on new presses that are shipped to Firestone plants.
   e. NRM well insulation.
2. Powerhouse - Plants ten years old or older.
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   b. Deaerator heater.
3. Maintenance.
   a. Gaskets made from a material containing asbestos.
   b. Welding blankets or guards.
4. Tire building - Hot knife boxes.
   a. 99R3 TAM - Asbestos tubing 1.5" o.d. - 1.25" i.d. x 1" long, two per machine. This tubing insulates the heated magnets from the rest of the assembly.

      Asbestos tape 0.5" wide x 15" long, four per machine. This tape is wrapped around the heating elements and tubing described above.

b. All Radial First Stage TAM's. Radial sidewall knife - Heat sink hot box. Manganese-nickel wire with asbestos-glass insulation AWG 14, 16" required per machine.

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1. Gaskets made from a material containing asbestos that are cut to size and drilled to open holes.

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Maintenance operations in plants often require the removal or demolition of old asbestos insulation. The removal of asbestos insulation is of considerable importance from the standpoint of compliance with federal regulations since the potential of employee exposure to airborne asbestos fibers is usually higher than in other operations.

The manual is divided into three sections. The first section describes the OSHA standard on asbestos. The second section describes the EPA regulations on asbestos which are applicable to Firestone operations. The third section summarizes the current Department of Transportation regulations on asbestos.

I. OSHA REGULATION SECTION 1910.1001

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All operations where asbestos and materials containing asbestos are being used or old asbestos insulation is being removed, replaced, or repaired must be monitored by air sampling to determine employee exposure to airborne asbestos fibers.

Samples should be collected from within the breathing zone of the employees on membrane filters mounted in an open face filter holder (cassette). Samples should be taken for the determination of the 8-hour time-weighted average concentration and of the ceiling concentration of asbestos fibers.

Cassettes for collecting air samples for asbestos are provided to the plants by the Industrial Hygiene Department. After sampling, these cassettes are returned to Industrial Hygiene for analysis and calculation of the airborne concentration of asbestos fibers. Detailed instructions on how to collect air samples for asbestos have been sent to the plant safety engineers by the Industrial Hygiene Department.

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Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the permissible exposure limit or the permissible ceiling concentration must be notified in writing of the exposure as soon as practicable but not later than 5 days of the finding. The employee must also be timely notified of the corrective action taken to reduce the airborne concentration of asbestos fibers.

Every employer must maintain records of any personal or environmental monitoring required by Section 1910.1001. Records must be maintained for a period of at least 20 years and must be made available upon request to the Assistant Secretary of Labor for OSHA, the Director of NIOSH, and to their authorized representatives.

Every employee and former employee shall have reasonable access to any records required to be maintained by this standard, which indicate the employee's own exposure to asbestos fibers.

Methods of Compliance

1. Particular Tools

   All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits listed above, such as saws, scorers, abrasive wheels, and drills, must be provided with local exhaust ventilation systems.

2. Wet Methods

   Insofar as practicable, asbestos must 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 permissible exposure limits, unless the usefulness of the product would be diminished by wetting it.

Spraying, Demolition, or Removal of Asbestos Insulation

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 must be provided with respiratory protective equipment and special clothing as described below.

Respiratory Protective Equipment

1. Air Purifying respirators

A reusable or single use (disposable) air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 2 but not greater than 20 fibers per cubic centimeter of air.

2. Powered Air Purifying Respirator

A powered air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 20 but not greater than 200 fibers per cubic centimeter of air.

3. Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type

A type C continuous flow or pressure-demand supplied-air respirator must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 200 fibers per cubic centimeter of air.

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Special Clothing - Clothes Lockers - Laundering

The employer must 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 permissible exposure limits, or who is engaged in the removal or demolition of asbestos insulation.

At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the permissible exposure limits, the employer must provide change rooms for employees working regularly at the place.

The employer must 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.

Laundering of asbestos contaminated clothing must be done so as to prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Any employer who gives asbestos contaminated clothing to another person for laundering must inform such person of the requirement to effectively prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Contaminated clothing must be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with paragraph (g)(2)(ii) of the standard.

It is now common practice among employers to provide their employees who are engaged in asbestos insulation removal with disposable coveralls, head coverings and shoe coverings. The use of disposable protective clothing eliminates the necessity of laundering work clothes contaminated with asbestos and all other problems associated with it.

Caution Signs and Caution Labels

Caution signs must be provided and displayed at each location where airborne concentrations of asbestos fibers may exceed the permissible exposure limits. Signs must 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 must be posted at all approaches to areas containing excessive concentrations of asbestos fibers.

The signs must display a legend which is described in paragraph (g)(1)(ii) of this standard.

Since during the short time needed for a demolition or removal of asbestos insulation it is not usually possible to determine if the concentration of airborne fibers is above or below the permissible exposure limits, caution signs should be posted at all asbestos removal operations. These signs should be removed after the work is completed.

Caution labels must 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 no airborne concentrations of asbestos fibers in excess of the permissible exposure limits will be released.

The statement that is required on the label is described in paragraph (g)(2)(ii) of this standard.

Housekeeping - Waste Disposal

All external surfaces in any place of employment must be maintained free of accumulations of asbestos fibers. Collection of settled dust or debris should be done by vacuum cleaning. Do not clean up asbestos by blowing or dry sweeping.

Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, that is to be disposed of, must be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

The federal regulations pertaining to asbestos waste disposal practices and procedures are described in the next section of the manual under US-EPA Regulations.

Medical Examinations

The standard requires that the employer provide or make available at his cost medical examinations to each of his employees exposed to asbestos fibers. The medical examinations program required by OSHA is presented below (this is a copy of the medical surveillance program for asbestos which has been adopted by the Corporate Medical Department).

ASBESTOS

A. Reason for medical surveillance

   1. Required by the OSHA asbestos standard (29 CFR 1910.1001(j))

B. Forms of asbestos included

   1. Chrysotile
   2. Amosite

3. Crocidolite
4. Tremolite
5. Anthophyllite
6. Actinolite

C. Level of exposure

1. Airborne exposure to asbestos at or above 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

Note: This definition of exposure has been established by OSHA Program Directive 300-16, effective October 11, 1978, and will not be found in the original OSHA asbestos standard.

D. Types of medical tests and procedures

1. Detailed work and medical history with particular attention to

a. Respiratory and cardiopulmonary disorders
b. Smoking habits

2. Comprehensive physical examination with particular attention to respiratory and cardiovascular systems

3. Chest x-rays - PA on 14" x 17" plate (a lateral x-ray is also strongly recommended)

4. Pulmonary function tests - FEV_1 and FVC

E. Frequency of medical tests and procedures

1. All tests and procedures

a. Prior to or within 30 days after placement in an exposure area where airborne asbestos levels exceed 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

b. At least annually while working in the exposure area

c. Within 30 days before or after termination of employment in an exposure area unless all the tests and procedures have been performed within the past year

F. Interpretation of medical tests and procedures

1. Chest x-rays should be interpreted by a radiologist

2. In order to unify and standardize the pulmonary function tests, the actual administration of the tests should be done by as few people as possible. The original tracing and interpretation should be given to the plant physician for medical management. A copy of each should be sent to the Corporate Medical Department for short and long term interpretation, study, and storage.

3. Whenever an employee shows signs or symptoms of chronic non-malignant or malignant lung disease or cardiopulmonary disorders which may be due to occupational exposure to asbestos, the Corporate Medical Department should be consulted.

4. Any abnormality in the chest x-rays as compared to established norms or earlier findings, a definite reduction in the FEV_1 or FVC, or degeneration of the employee's general respiratory condition should be reasons for not employing or for removing the employee from the asbestos exposure area.

5. The responsibility for medical removal and reinstatement is that of the plant physician in consultation with as many other physicians as he deems necessary.

6. Medical records of employees examined under this protocol, including examination and test results, written medical opinions, and records of employee complaints, should be retained for at least five years after the last employment for each employee, or for twenty years from the date of the record, whichever is longer.

II. US-EPA REGULATION

Introduction

The US-EPA has established emission standards for certain hazardous air pollutants under its National Emission Standards for Hazardous Air Pollutants Regulations (NESHAPS). Asbestos is included as one of the four substances currently regulated under these regulations (40 CFR Part 61, Subpart B).

The NESHAPS regulations are applicable to the following operations:

a) asbestos mills
b) roadways
c) manufacturing
d) demolition and renovation
e) spraying
f) fabricating
g) insulating
h) waste disposal

Based upon Environmental Engineering's knowledge, Firestone is mainly involved in Items (d) and (h) above.

US-EPA intentions are to administer these regulations on a state by state basis by delegating authority to the individual state air control agencies (i.e., once they have met all the necessary requirements). To date, 31 states have been given this authority as follows: Alabama, Arizona, California, Colorado, Connecticut, Delaware, Georgia, Indiana, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, Texas, Vermont, Virginia, Washington, Wisconsin, Puerto Rico, and U. S. Virgin Islands.

These regulations (i.e., NESHAPS) for controlling asbestos emissions were first promulgated on April 6, 1973 (38 FR 8820) in fulfilling requirements under Section 112 (B) of the Clean Air Act, as amended December 1970. Since then they have undergone various revisions, the most recent of which was promulgated February 7, 1979, giving the State of Texas authority to administer the NESHAPS program and issue permits, etc. in the state.

From time to time additional pollutants which are found to be hazardous[1] will be included under EPA NESHAPS regulations (i.e., vinyl chloride was added to the original list on October 21, 1976, 41 FR 46560).

[1]May cause, or contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness - Clean Air Act, Section 112(1), December 1970.

Reason for Control of Asbestos Emissions

A large number of studies have shown an association between occupational exposure to asbestos and a higher than expected incidence of bronchial cancer. Asbestos also has been identified as a causal factor in the development of cancers of the membranes of the chest and abdomen.

Emission Standard for Asbestos

Basically the regulations prohibit any discharge of asbestos to the outside air which creates a visible emission which may be detected without the aid of instruments. By definition, outside air means the air outside buildings or structures.

A source can use a specified method of air cleaning (fabric filter systems, etc.) to eliminate such emissions, provided that the emission control equipment is approved by the administrator of the US-EPA or his authorized representative.

Specifically the asbestos standards are:

1. There shall be no visible emissions to the outside air from any asbestos mill, except when a specified method of air cleaning, also part of these standards, is used before the emissions escape to the outside air. In general, these air-cleaning systems filter asbestos emissions to the point that visible emissions would not be produced anyway.

2. The surfacing of roadways with asbestos tailings is prohibited, except for temporary roadways in an area of asbestos ore deposits.

3. There shall be no visible emissions to the outside air, unless the specified air cleaning methods are used, from any operation which manufacturers: cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, other textile products, cement products, fireproofing and insulating materials, friction products, paper, millboard, felt, floor tile, paints, coatings, caulks, adhesives, sealants, plastics and rubber materials, and chlorine.

4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

c. No asbestos debris shall be dropped or thrown to the ground or from one floor to another. For buildings 50 feet or greater in height, asbestos debris shall be lowered to the ground via dust-tight chutes or containers.

d. Written notice of intention to demolish shall be provided to the US-EPA Regional Administrator at least 10 days prior to commencement of demolition. This notice shall include items under Section 61.22(d)(2) of this regulation.

e. Certain demolition operations are exempt from the regulations, except for the wetting of asbestos debris and the notification requirement, if a building has been declared to be structurally unsound and in danger of imminent collapse.

f. Asbestos waste shall be sealed in leak-tight containers while wet, prior to being sent to an approved waste disposal site.

g. The leak-tight containers (Item f) should be labeled with a warning label which reads:

CAUTION

Contains Asbestos

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

h. The owner or operator of a demolition operation is exempted from these requirements, with the exception of Item d above, provided the amount of friable asbestos materials in the building or portion thereof to be demolished is less than 80 meters (ca. 260 feet) used on pipes, and less than 15 square meters (ca. 160 square feet) used on any duct, boiler, tank, reactor, turbine, furnace, or structural member.

These regulations also set forth collection, processing, and disposal requirements which the waste disposal firm must adhere to in handling and disposing of this waste (40 CFR 61.25). Since Firestone in most cases, if not all, will be utilizing outside firms for disposal of its asbestos wastes, no further

discussion of these requirements will be presented herein. Firestone, however, must verify that any firm selected to dispose of its asbestos waste will meet the requirements of paragraph 61.25 (i.e., approved operation).

Following is Section 61.22(d)(2) of the Emission standard:

> Written notice of intention to demolish or renovate shall be provided to the Administrator by the owner or operator of the demolition or renovation operation. Such notice shall be postmarked or delivered to the Administrator at least 10 days prior to commencement of demolition, or as early as possible prior to commencement of emergency demolition subject to paragraph (d)(6) of this section, and as early as possible prior to commencement of renovation. Such notice shall include the following information:
>
> (i) Name of owner or operator.
>
> (ii) Address of owner or operator.
>
> (iii) Description of the building, structure, facility, or installation to be demolished or renovated, including the size, age, and prior use of the structure, and the approximate amount of friable asbestos materials present.
>
> (iv) Address or location of the building, structure, facility, or installation.
>
> (v) Scheduled starting and completion dates of demolition or renovation.
>
> (vi) Nature of planned demolition or renovation and method(s) to be employed.
>
> (vii) Procedures to be employed to meet the requirements of this paragraph and paragraph (j) of this section.
>
> (viii) The name and address or location of the waste disposal site where the friable asbestos waste will be deposited.
>
> (ix) Name, title, and authority of the State or local governmental representative who has ordered a demolition which is subject to paragraph (d)(6) of this section.

III. DEPARTMENT OF TRANSPORTATION REGULATIONS

The Department of Transportation (DOT) currently regulates only the transportation of commercial asbestos. They do not regulate:

1. Asbestos which has no commercial value, such as products which contain trace amounts as a contaminant (49 CFR 173.1090(c)).

2. Waste asbestos which is currently proposed to be regulated under DOT hazardous waste regulations (preamble to final commercial asbestos rule issued December 4, 1978).

3. Asbestos which is immersed or fixed in a natural or artificial binder material such as cement, plastic, asphalt, resin, or mineral ore (49 CFR 173.1090(c)).

DOT does regulate commercial asbestos which is defined as any material or product which has commercial value because of its asbestos content (49 CFR 173.1090(a)).

When regulated, DOT requires that shipments of asbestos meet the following requirements:

1. Packaging must be as specified in 49 CFR 173.1090(d):

   a. Leak-tight packages such as metal or fiber drums.

   b. Bags which are dust and sift proof and are unitized on a pallet. Pallet loads should be encased in a shrink wrapped plastic film or fiberboard secured by strapping.

   c. Bags placed inside wooden or fiberboard boxes.

2. Each outside package must be marked with the word "Asbestos" and the name and address of the consignee or consignor (49 CFR 173.304 and 173.306).

3. Each outside container must be marked "ORM-C" in an appropriate rectangle (49 CFR 172.316). Labels which can be used for this purpose are available through normal Firestone stationery store channels. The form number and description for ordering purposes is "S-8974, ORM-C Label".

4. Asbestos shipped via the water or air mode must also meet the following shipping paper requirements (49 CFR 172.200):

a. The total amount of commercial asbestos being shipped, i.e., the net weight of the product containing commercial asbestos (49 CFR 172.202).

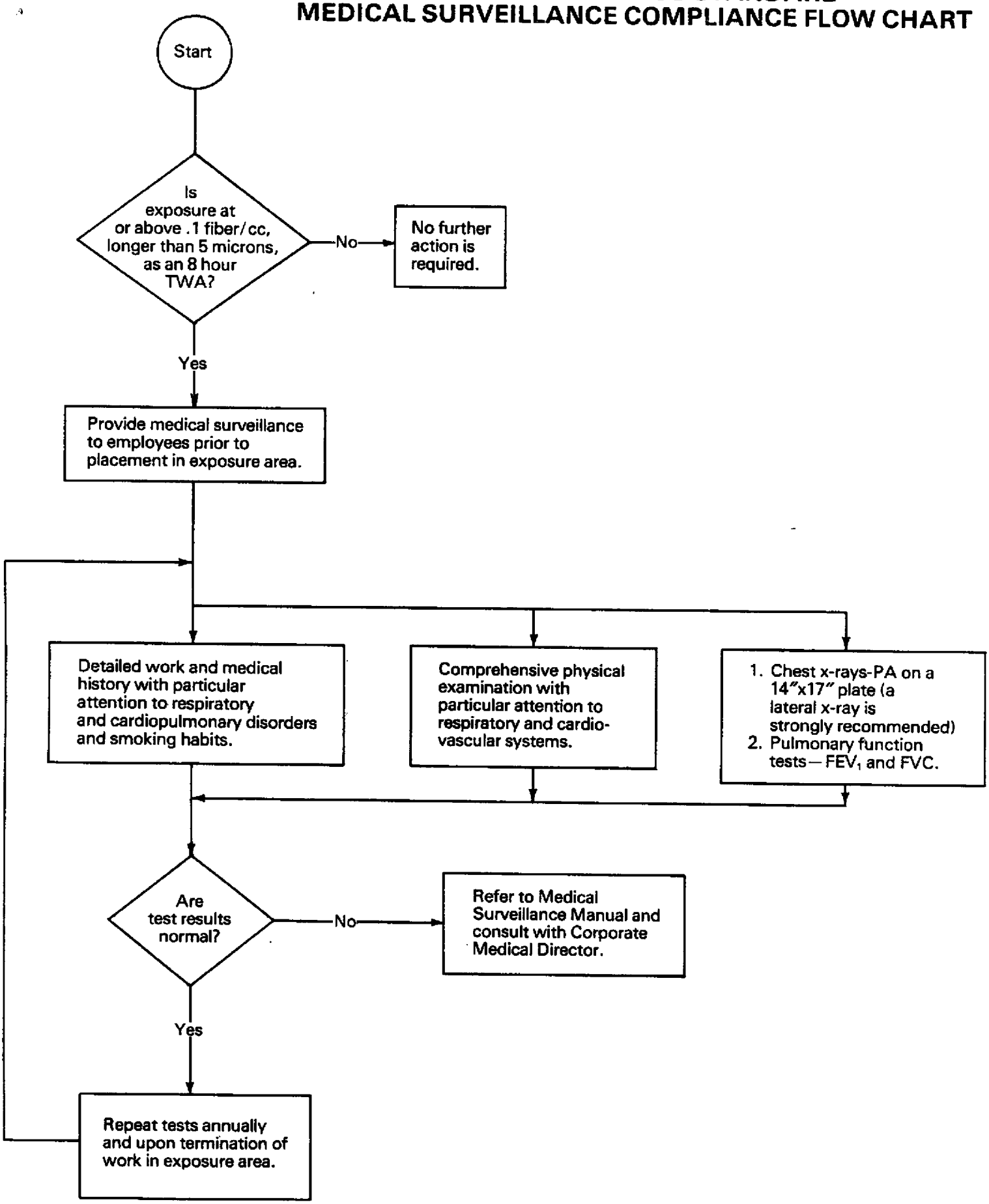
b. The proper shipping name and hazard class, i.e., Asbestos ORM-C (49 CFR 172.202).

c. If shipped on the same bill of lading with non-hazardous materials, the asbestos entry should be before any non-hazardous entries or in a contrasting color (highlighted)(49 CFR 172.201).

d. A signed certification (49 CFR 172.204).

There are no shipping paper requirements when commercial asbestos is shipped via truck or rail modes (49 CFR 172.200).

FEDERAL ASBESTOS STANDARD
MEDICAL SURVEILLANCE COMPLIANCE FLOW CHART



ASBESTOS MANUAL

November 9, 1979

The Firestone Tire & Rubber Company

CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in	
Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

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CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

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The signs must display a legend which is described in paragraph (g)(1)(ii) of this standard.

Since during the short time needed for a demolition or removal of asbestos insulation it is not usually possible to determine if the concentration of airborne fibers is above or below the permissible exposure limits, caution signs should be posted at all asbestos removal operations. These signs should be removed after the work is completed.

Caution labels must 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 no airborne concentrations of asbestos fibers in excess of the permissible exposure limits will be released.

The statement that is required on the label is described in paragraph (g)(2)(ii) of this standard.

Housekeeping - Waste Disposal

All external surfaces in any place of employment must be maintained free of accumulations of asbestos fibers. Collection of settled dust or debris should be done by vacuum cleaning. Do not clean up asbestos by blowing or dry sweeping.

Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, that is to be disposed of, must be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

The federal regulations pertaining to asbestos waste disposal practices and procedures are described in the next section of the manual under US-EPA Regulations.

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The standard requires that the employer provide or make available at his cost medical examinations to each of his employees exposed to asbestos fibers. The medical examinations program required by OSHA is presented below (this is a copy of the medical surveillance program for asbestos which has been adopted by the Corporate Medical Department).

ASBESTOS

A. Reason for medical surveillance

1. Required by the OSHA asbestos standard (29 CFR 1910. 1001 (j))

B. Forms of asbestos included

1. Chrysotile
2. Amosite

3. Crocidolite
4. Tremolite
5. Anthophyllite
6. Actinolite

C. Level of exposure

1. Airborne exposure to asbestos at or above 0.1 fibers, longer than 5 micrometers, per cubic centimeter of air as an 8-hour time-weighted average

Note: This definition of exposure has been established by OSHA Program Directive 300-16, effective October 11, 1978, and will not be found in the original OSHA asbestos standard.

D. Types of medical tests and procedures

1. Detailed work and medical history with particular attention to

a. Respiratory and cardiopulmonary disorders
b. Smoking habits

2. Comprehensive physical examination with particular attention to respiratory and cardiovascular systems

3. Chest x-rays - PA on 14" x 17" plate (a lateral x-ray is also strongly recommended)

4. Pulmonary function tests - FEV_1 and FVC

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c. Within 30 days before or after termination of employment in an exposure area unless all the tests and procedures have been performed within the past year

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2. In order to unify and standardize the pulmonary function tests, the actual administration of the tests should be done by as few people as possible. The original tracing and interpretation should be given to the plant physician for medical management. A copy of each should be sent to the Corporate Medical Department for short and long term interpretation, study, and storage.

3. Whenever an employee shows signs or symptoms of chronic non-malignant or malignant lung disease or cardiopulmonary disorders which may be due to occupational exposure to asbestos, the Corporate Medical Department should be consulted.

4. Any abnormality in the chest x-rays as compared to established norms or earlier findings, a definite reduction in the FEV_1 or FVC, or degeneration of the employee's general respiratory condition should be reasons for not employing or for removing the employee from the asbestos exposure area.

5. The responsibility for medical removal and reinstatement is that of the plant physician in consultation with as many other physicians as he deems necessary.

6. Medical records of employees examined under this protocol, including examination and test results, written medical opinions, and records of employee complaints, should be retained for at least five years after the last employment for each employee, or for twenty years from the date of the record, whichever is longer.

II. US-EPA REGULATION

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The US-EPA has established emission standards for certain hazardous air pollutants under its National Emission Standards for Hazardous Air Pollutants Regulations (NESHAPS). Asbestos is included as one of the four substances currently regulated under these regulations (40 CFR Part 61, Subpart B).

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US-EPA intentions are to administer these regulations on a state by state basis by delegating authority to the individual state air control agencies (i.e., once they have met all the necessary requirements). To date, 31 states have been given this authority as follows: Alabama, Arizona, California, Colorado, Connecticut, Delaware, Georgia, Indiana, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, Texas, Vermont, Virginia, Washington, Wisconsin, Puerto Rico, and U. S. Virgin Islands.

These regulations (i.e., NESHAPS) for controlling asbestos emissions were first promulgated on April 6, 1973 (38 FR 8820) in fulfilling requirements under Section 112 (B) of the Clean Air Act, as amended December 1970. Since then they have undergone various revisions, the most recent of which was promulgated February 7, 1979, giving the State of Texas authority to administer the NESHAPS program and issue permits, etc. in the state.

From time to time additional pollutants which are found to be hazardous[1] will be included under EPA NESHAPS regulations (i.e., vinyl chloride was added to the original list on October 21, 1976, 41 FR 46560).

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Basically the regulations prohibit any discharge of asbestos to the outside air which creates a visible emission which may be detected without the aid of instruments. By definition, outside air means the air outside buildings or structures.

A source can use a specified method of air cleaning (fabric filter systems, etc.) to eliminate such emissions, provided that the emission control equipment is approved by the administrator of the US-EPA or his authorized representative.

Specifically the asbestos standards are:

1. There shall be no visible emissions to the outside air from any asbestos mill, except when a specified method of air cleaning, also part of these standards, is used before the emissions escape to the outside air. In general, these air-cleaning systems filter asbestos emissions to the point that visible emissions would not be produced anyway.

2. The surfacing of roadways with asbestos tailings is prohibited, except for temporary roadways in an area of asbestos ore deposits.

3. There shall be no visible emissions to the outside air, unless the specified air cleaning methods are used, from any operation which manufacturers: cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, other textile products, cement products, fireproofing and insulating materials, friction products, paper, millboard, felt, floor tile, paints, coatings, caulks, adhesives, sealants, plastics and rubber materials, and chlorine.

4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

c. No asbestos debris shall be dropped or thrown to the ground or from one floor to another. For buildings 50 feet or greater in height, asbestos debris shall be lowered to the ground via dust-tight chutes or containers.

d. Written notice of intention to demolish shall be provided to the US-EPA Regional Administrator at least 10 days prior to commencement of demolition. This notice shall include items under Section 61.22(d)(2) of this regulation.

e. Certain demolition operations are exempt from the regulations, except for the wetting of asbestos debris and the notification requirement, if a building has been declared to be structurally unsound and in danger of imminent collapse.

f. Asbestos waste shall be sealed in leak-tight containers while wet, prior to being sent to an approved waste disposal site.

g. The leak-tight containers (Item f) should be labeled with a warning label which reads:

CAUTION

Contains Asbestos

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

h. The owner or operator of a demolition operation is exempted from these requirements, with the exception of Item d above, provided the amount of friable asbestos materials in the building or portion thereof to be demolished is less than 80 meters (ca. 260 feet) used on pipes, and less than 15 square meters (ca. 160 square feet) used on any duct, boiler, tank, reactor, turbine, furnace, or structural member.

These regulations also set forth collection, processing, and disposal requirements which the waste disposal firm must adhere to in handling and disposing of this waste (40 CFR 61.25). Since Firestone in most cases, if not all, will be utilizing outside firms for disposal of its asbestos wastes, no further

discussion of these requirements will be presented herein. Firestone, however, must verify that any firm selected to dispose of its asbestos waste will meet the requirements of paragraph 61.25 (i.e., approved operation).

Following is Section 61.22(d)(2) of the Emission standard:

> Written notice of intention to demolish or renovate shall be provided to the Administrator by the owner or operator of the demolition or renovation operation. Such notice shall be postmarked or delivered to the Administrator at least 10 days prior to commencement of demolition, or as early as possible prior to commencement of emergency demolition subject to paragraph (d)(6) of this section, and as early as possible prior to commencement of renovation. Such notice shall include the following information:
>
> (i) Name of owner or operator.
>
> (ii) Address of owner or operator.
>
> (iii) Description of the building, structure, facility, or installation to be demolished or renovated, including the size, age, and prior use of the structure, and the approximate amount of friable asbestos materials present.
>
> (iv) Address or location of the building, structure, facility, or installation.
>
> (v) Scheduled starting and completion dates of demolition or renovation.
>
> (vi) Nature of planned demolition or renovation and method(s) to be employed.
>
> (vii) Procedures to be employed to meet the requirements of this paragraph and paragraph (j) of this section.
>
> (viii) The name and address or location of the waste disposal site where the friable asbestos waste will be deposited.
>
> (ix) Name, title, and authority of the State or local governmental representative who has ordered a demolition which is subject to paragraph (d)(6) of this section.

III. DEPARTMENT OF TRANSPORTATION REGULATIONS

The Department of Transportation (DOT) currently regulates only the transportation of commercial asbestos. They do not regulate:

1. Asbestos which has no commercial value, such as products which contain trace amounts as a contaminant (49 CFR 173.1090(c)).

2. Waste asbestos which is currently proposed to be regulated under DOT hazardous waste regulations (preamble to final commercial asbestos rule issued December 4, 1978).

3. Asbestos which is immersed or fixed in a natural or artificial binder material such as cement, plastic, asphalt, resin, or mineral ore (49 CFR 173.1090(c)).

DOT does regulate commercial asbestos which is defined as any material or product which has commercial value because of its asbestos content (49 CFR 173.1090(a)).

When regulated, DOT requires that shipments of asbestos meet the following requirements:

1. Packaging must be as specified in 49 CFR 173.1090(d):

   a. Leak-tight packages such as metal or fiber drums.

   b. Bags which are dust and sift proof and are unitized on a pallet. Pallet loads should be encased in a shrink wrapped plastic film or fiberboard secured by strapping.

   c. Bags placed inside wooden or fiberboard boxes.

2. Each outside package must be marked with the word "Asbestos" and the name and address of the consignee or consignor (49 CFR 173.304 and 173.306).

3. Each outside container must be marked "ORM-C" in an appropriate rectangle (49 CFR 172.316). Labels which can be used for this purpose are available through normal Firestone stationery store channels. The form number and description for ordering purposes is "S-8974, ORM-C Label".

4. Asbestos shipped via the water or air mode must also meet the following shipping paper requirements (49 CFR 172.200):

a. The total amount of commercial asbestos being shipped, i.e., the net weight of the product containing commercial asbestos (49 CFR 172.202).

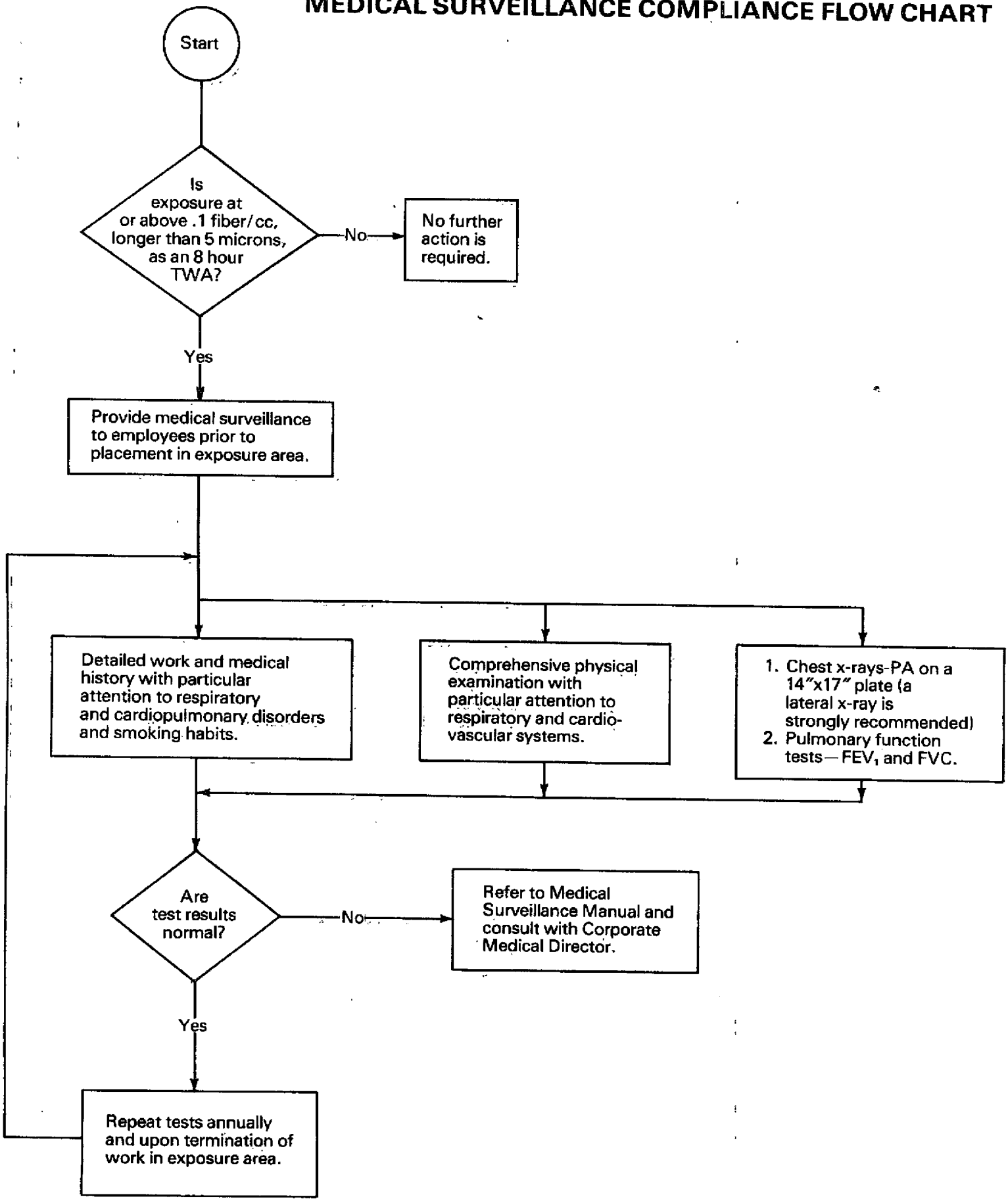
b. The proper shipping name and hazard class, i.e., Asbestos ORM-C (49 CFR 172.202).

c. If shipped on the same bill of lading with non-hazardous materials, the asbestos entry should be before any non-hazardous entries or in a contrasting color (highlighted)(49 CFR 172.201).

d. A signed certification (49 CFR 172.204).

There are no shipping paper requirements when commercial asbestos is shipped via truck or rail modes (49 CFR 172.200).

FEDERAL ASBESTOS STANDARD MEDICAL SURVEILLANCE COMPLIANCE FLOW CHART



ASBESTOS MANUAL

November 9, 1979

The Firestone Tire & Rubber Company

CONTENTS

	Page
Introduction	1
Asbestos May Still be Found in Tire Plants	1
All Other Plants	2
OSHA Regulations	3
Permissible Average Exposure Limit and Ceiling Concentration	3
Air Monitoring and Sampling Frequency	3
Employee Notification and Recordkeeping of Exposure Results	4
Methods of Compliance	4
Particular Tools	4
Wet Methods	4
Spraying, Demolition, or Removal of Asbestos Insulation	4
Respiratory Protective Equipment	5
Air Purifying Respirators	5
Powered Air Purifying Respirator	5
Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type	5
Special Clothing - Clothes Lockers - Laundering	5
Caution Signs and Caution Labels	6

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CONTENTS.....(Cont'd.)

	Page
Housekeeping - Waste Disposal.....	7
Medical Examinations.....	7
Asbestos.....	7
A. Reason for medical surveillance.....	7
B. Forms of asbestos included.....	7
C. Level of exposure.....	8
D. Types of medical tests and procedures.....	8
E. Frequency of medical tests and procedures.....	8
F. Interpretation of medical tests and procedures.....	9
US-EPA Regulation.....	10
Introduction.....	10
Reason for Control of Asbestos Emissions.....	11
Emission Standard for Asbestos.....	11
Section 61.22(d)(2) of the Emission Standard.....	13
Department of Transportation Regulation.....	14
Medical Surveillance Flow Chart.....	16

INTRODUCTION

Asbestos and materials containing asbestos are now regulated by several federal regulatory agencies. The purpose of this manual is to compile in one document all applicable federal regulations and assist and guide the plants in complying with these regulations.

The use of asbestos or materials containing asbestos in our plants is now very limited. According to the information that we have available, asbestos insulation may still be used or found in the following areas:

Tire Plants

1. Curing area.
   a. Old pipe insulation.
   b. Curing press heat shields.
   c. Board type asbestos insulation between press platens or domes and in the curing press frame. This asbestos material is cut or machined by the McNeil Company or NRM and is only installed by Firestone people.
   d. Pipe insulation installed by McNeil or NRM on new presses that are shipped to Firestone plants.
   e. NRM well insulation.
2. Powerhouse - Plants ten years old or older.
   a. Pipe insulation.
   b. Deaerator heater.
3. Maintenance.
   a. Gaskets made from a material containing asbestos.
   b. Welding blankets or guards.
4. Tire building - Hot knife boxes.
   a. 99R3 TAM - Asbestos tubing 1.5" o.d. - 1.25" i.d. x 1" long, two per machine. This tubing insulates the heated magnets from the rest of the assembly.

      Asbestos tape 0.5" wide x 15" long, four per machine. This tape is wrapped around the heating elements and tubing described above.

b. All Radial First Stage TAM's. Radial sidewall knife - Heat sink hot box. Manganese-nickel wire with asbestos-glass insulation AWG 14, 16" required per machine.

All Other Plants

1. Gaskets made from a material containing asbestos that are cut to size and drilled to open holes.

2. Experimental formulation of small batches of rubber products containing asbestos. This is done in an Akron laboratory of the Synthetic Rubber Division.

Maintenance operations in plants often require the removal or demolition of old asbestos insulation. The removal of asbestos insulation is of considerable importance from the standpoint of compliance with federal regulations since the potential of employee exposure to airborne asbestos fibers is usually higher than in other operations.

The manual is divided into three sections. The first section describes the OSHA standard on asbestos. The second section describes the EPA regulations on asbestos which are applicable to Firestone operations. The third section summarizes the current Department of Transportation regulations on asbestos.

I. OSHA REGULATION SECTION 1910.1001

The OSHA standard on asbestos is described in Section 1910.1001 of the OSHA standards book.

Permissible Average Exposure Limit and Ceiling Concentration

The present 8-hour time-weighted average permissible exposure limit is two (2) fibers, longer than 5 microns, per cubic centimeter of air.

The permissible ceiling exposure limit is ten (10) fibers, longer than 5 microns, per cubic centimeter of air, as determined over a period of 15 minutes.

Air Monitoring and Sampling Frequency

All operations where asbestos and materials containing asbestos are being used or old asbestos insulation is being removed, replaced, or repaired must be monitored by air sampling to determine employee exposure to airborne asbestos fibers.

Samples should be collected from within the breathing zone of the employees on membrane filters mounted in an open face filter holder (cassette). Samples should be taken for the determination of the 8-hour time-weighted average concentration and of the ceiling concentration of asbestos fibers.

Cassettes for collecting air samples for asbestos are provided to the plants by the Industrial Hygiene Department. After sampling, these cassettes are returned to Industrial Hygiene for analysis and calculation of the airborne concentration of asbestos fibers. Detailed instructions on how to collect air samples for asbestos have been sent to the plant safety engineers by the Industrial Hygiene Department.

After the initial determination, samples should be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees to asbestos fibers. In no case should the sampling be done at intervals greater than 6 months for employees whose exposure to asbestos exceeds the permissible exposure limit or the permissible ceiling concentration.

Affected employees, or their representatives, should be given an opportunity to observe the monitoring operation.

Employee Notification and Recordkeeping of Exposure Results

Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the permissible exposure limit or the permissible ceiling concentration must be notified in writing of the exposure as soon as practicable but not later than 5 days of the finding. The employee must also be timely notified of the corrective action taken to reduce the airborne concentration of asbestos fibers.

Every employer must maintain records of any personal or environmental monitoring required by Section 1910.1001. Records must be maintained for a period of at least 20 years and must be made available upon request to the Assistant Secretary of Labor for OSHA, the Director of NIOSH, and to their authorized representatives.

Every employee and former employee shall have reasonable access to any records required to be maintained by this standard, which indicate the employee's own exposure to asbestos fibers.

Methods of Compliance

1. Particular Tools

   All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits listed above, such as saws, scorers, abrasive wheels, and drills, must be provided with local exhaust ventilation systems.

2. Wet Methods

   Insofar as practicable, asbestos must 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 permissible exposure limits, unless the usefulness of the product would be diminished by wetting it.

Spraying, Demolition, or Removal of Asbestos Insulation

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 must be provided with respiratory protective equipment and special clothing as described below.

Respiratory Protective Equipment

1. Air Purifying respirators

A reusable or single use (disposable) air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 2 but not greater than 20 fibers per cubic centimeter of air.

2. Powered Air Purifying Respirator

A powered air purifying respirator, or a respirator of higher efficiency, must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 20 but not greater than 200 fibers per cubic centimeter of air.

3. Type "C" Supplied-air Respirators, Continuous Flow or Pressure-demand Type

A type C continuous flow or pressure-demand supplied-air respirator must be used by the employees when the 8-hour time-weighted average airborne concentration of asbestos fibers is greater than 200 fibers per cubic centimeter of air.

The OSHA standard specifies that employees engaged in the removal or demolition of asbestos insulation shall be provided with supplied-air respirators. For the removal of large sections of insulation which would normally last several days, a supplied-air respirator must be provided. As a general guideline, when the amount of asbestos to be removed is small and the operation will only last a few hours or less, a supplied-air respirator should still be provided if feasible. If this is not feasible, at least an air purifying respirator should be provided.

Special Clothing - Clothes Lockers - Laundering

The employer must 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 permissible exposure limits, or who is engaged in the removal or demolition of asbestos insulation.

At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the permissible exposure limits, the employer must provide change rooms for employees working regularly at the place.

The employer must 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.

Laundering of asbestos contaminated clothing must be done so as to prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Any employer who gives asbestos contaminated clothing to another person for laundering must inform such person of the requirement to effectively prevent the release of airborne asbestos fibers in excess of the permissible exposure limits.

Contaminated clothing must be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with paragraph (g)(2)(ii) of the standard.

It is now common practice among employers to provide their employees who are engaged in asbestos insulation removal with disposable coveralls, head coverings and shoe coverings. The use of disposable protective clothing eliminates the necessity of laundering work clothes contaminated with asbestos and all other problems associated with it.

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4. The regulations covering demolition and renovation of buildings are:

    a. Asbestos materials used to insulate or fireproof any boiler, pipe, or structural member shall be wetted and removed from any building before the wrecking begins. The asbestos debris shall be wetted at all stages of demolition and related handling operations.

b. No pipe or structural member covered with asbestos insulating or fireproofing material shall be dropped or thrown from any building but shall be carefully lowered to ground level.

c. No asbestos debris shall be dropped or thrown to the ground or from one floor to another. For buildings 50 feet or greater in height, asbestos debris shall be lowered to the ground via dust-tight chutes or containers.

d. Written notice of intention to demolish shall be provided to the US-EPA Regional Administrator at least 10 days prior to commencement of demolition. This notice shall include items under Section 61.22(d)(2) of this regulation.

e. Certain demolition operations are exempt from the regulations, except for the wetting of asbestos debris and the notification requirement, if a building has been declared to be structurally unsound and in danger of imminent collapse.

f. Asbestos waste shall be sealed in leak-tight containers while wet, prior to being sent to an approved waste disposal site.

g. The leak-tight containers (Item f) should be labeled with a warning label which reads:

CAUTION

Contains Asbestos

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

h. The owner or operator of a demolition operation is exempted from these requirements, with the exception of Item d above, provided the amount of friable asbestos materials in the building or portion thereof to be demolished is less than 80 meters (ca. 260 feet) used on pipes, and less than 15 square meters (ca. 160 square feet) used on any duct, boiler, tank, reactor, turbine, furnace, or structural member.

These regulations also set forth collection, processing, and disposal requirements which the waste disposal firm must adhere to in handling and disposing of this waste (40 CFR 61.25). Since Firestone in most cases, if not all, will be utilizing outside firms for disposal of its asbestos wastes, no further

discussion of these requirements will be presented herein. Firestone, however, must verify that any firm selected to dispose of its asbestos waste will meet the requirements of paragraph 61.25 (i.e., approved operation).

Following is Section 61.22(d)(2) of the Emission standard:

> Written notice of intention to demolish or renovate shall be provided to the Administrator by the owner or operator of the demolition or renovation operation. Such notice shall be postmarked or delivered to the Administrator at least 10 days prior to commencement of demolition, or as early as possible prior to commencement of emergency demolition subject to paragraph (d)(6) of this section, and as early as possible prior to commencement of renovation. Such notice shall include the following information:
>
> (i) Name of owner or operator.
>
> (ii) Address of owner or operator.
>
> (iii) Description of the building, structure, facility, or installation to be demolished or renovated, including the size, age, and prior use of the structure, and the approximate amount of friable asbestos materials present.
>
> (iv) Address or location of the building, structure, facility, or installation.
>
> (v) Scheduled starting and completion dates of demolition or renovation.
>
> (vi) Nature of planned demolition or renovation and method(s) to be employed.
>
> (vii) Procedures to be employed to meet the requirements of this paragraph and paragraph (j) of this section.
>
> (viii) The name and address or location of the waste disposal site where the friable asbestos waste will be deposited.
>
> (ix) Name, title, and authority of the State or local governmental representative who has ordered a demolition which is subject to paragraph (d)(6) of this section.

III. DEPARTMENT OF TRANSPORTATION REGULATIONS

The Department of Transportation (DOT) currently regulates only the transportation of commercial asbestos. They do not regulate:

1. Asbestos which has no commercial value, such as products which contain trace amounts as a contaminant (49 CFR 173.1090(c)).

2. Waste asbestos which is currently proposed to be regulated under DOT hazardous waste regulations (preamble to final commercial asbestos rule issued December 4, 1978).

3. Asbestos which is immersed or fixed in a natural or artificial binder material such as cement, plastic, asphalt, resin, or mineral ore (49 CFR 173.1090(c)).

DOT does regulate commercial asbestos which is defined as any material or product which has commercial value because of its asbestos content (49 CFR 173.1090(a)).

When regulated, DOT requires that shipments of asbestos meet the following requirements:

1. Packaging must be as specified in 49 CFR 173.1090(d):

   a. Leak-tight packages such as metal or fiber drums.

   b. Bags which are dust and sift proof and are unitized on a pallet. Pallet loads should be encased in a shrink wrapped plastic film or fiberboard secured by strapping.

   c. Bags placed inside wooden or fiberboard boxes.

2. Each outside package must be marked with the word "Asbestos" and the name and address of the consignee or consignor (49 CFR 173.304 and 173.306).

3. Each outside container must be marked "ORM-C" in an appropriate rectangle (49 CFR 172.316). Labels which can be used for this purpose are available through normal Firestone stationery store channels. The form number and description for ordering purposes is "S-8974, ORM-C Label".

4. Asbestos shipped via the water or air mode must also meet the following shipping paper requirements (49 CFR 172.200):

a. The total amount of commercial asbestos being shipped, i.e., the net weight of the product containing commercial asbestos (49 CFR 172.202).

b. The proper shipping name and hazard class, i.e., Asbestos ORM-C (49 CFR 172.202).

c. If shipped on the same bill of lading with non-hazardous materials, the asbestos entry should be before any non-hazardous entries or in a contrasting color (highlighted)(49 CFR 172.201).

d. A signed certification (49 CFR 172.204).

There are no shipping paper requirements when commercial asbestos is shipped via truck or rail modes (49 CFR 172.200).

FEDERAL ASBESTOS STANDARD
MEDICAL SURVEILLANCE COMPLIANCE FLOW CHART

