File Asbestos STDS

SAR

WEDNESDAY, MARCH 2, 1977

PART II

PLAINTIFF'S EXHIBIT

MON-2413

THE NATIONAL ARCHIVES OF THE UNITED STATES 1934

federal register

ENVIRONMENTAL PROTECTION AGENCY

ASBESTOS

Hazardous Air Pollutants Proposed National Emission Standards

6113
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B003571
LAM021696

ENVIRONMENTAL PROTECTION AGENCY

[40 CFR P (61)

[FRL 64]

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR P PUTANTS

Proposed Amendment to Asbestos Standard

[illegible] proposed under the authority of Section [illegible] Clean Air Act [illegible] prior to proposal to amend [illegible] standard [illegible]

SUMMARY OF PROPOSED AMENDMENTS

The proposed amendments would extend the coverage of the demolition and removal provisions (40 CFR 61.22(d)) to all materials which are friable and contain more than one percent asbestos by weight. The current provisions apply only to insulation and fireproofing materials. The proposed amendments similarly would extend the coverage of the asbestos spraying provisions (40 CFR 61.22 (c)) by prohibiting all materials sprayed on buildings, structures, structural members, pipes and conduits which contain more than one percent asbestos by weight. The proposed amendments specify that materials sprayed on structural members are covered.

DISCUSSION

On April 6, 1973, under Section 112 of the Clean Air Act, as amended, the Administrator promulgated the national emission standard for asbestos. Amendments to this standard were promulgated on May 3, 1974 (39 FR 15396) and on October 14, 1975 (40 FR 48292). One of the provisions of the standard limits asbestos emissions from the spraying of materials to insulate or fireproof buildings, structures, pipes and conduits. The standard prohibits the use of such materials which contain more than one percent asbestos on a dry weight basis. At the time the standard was promulgated, EPA did not know of uses other than fireproofing and insulation for asbestos-containing spray-on materials that were major sources of asbestos emissions during application or later removal through renovation or demolition. Recently it has come to EPA's attention that certain types of decorative spray-on materials which contain from 29 to 61 percent asbestos by weight have been sprayed on ceilings in residential buildings and may be applied in the same manner in the future. These materials are sometimes friable and therefore would be a major source of asbestos emissions during renovation and demolition operations. The use of such spray-on materials is considered a major source of asbestos emissions because: (1) There are asbestos emissions resulting from over-spray during the spray-on application of such materials which could be emitted to the atmosphere directly and cause exposure to the general public, (2) this over-spray [illegible] and (3) the [illegible] of the [illegible] are [illegible] with the [illegible] the [illegible] and [illegible] of [illegible] materials be [illegible] application they would [illegible] to the [illegible] or structures [illegible] or demolished.

For these reasons, EPA is proposing to prohibit the spraying of all materials which contain [illegible] in excess of one percent by weight on buildings, structures, structural members, pipes, and conduits. The prohibition includes [illegible] application of paints, decorative plasters, and weatherproofing.

An amendment is also being proposed which would extend the coverage of the demolition and renovation provisions to include the proper removal of all friable materials which contain in excess of one percent asbestos prior to renovation or demolition of buildings, structures, facilities, or installations. Currently, the standard applies only to the removal of fireproofing or insulation which is friable and contains greater than one percent asbestos. Proper removal of such materials is considered necessary to reduce asbestos emission during renovation and demolition operations to a minimum.

EPA feels that it is urgent that the persons or firms who still apply or manufacture asbestos-containing spray-on materials be advised as early as possible of EPA's intent to regulate such application and of the potential hazard associated with the use of such products. In order to fully investigate all aspects and possible impacts of the proposed amendments, EPA is requesting that all interested persons submit factual information related to the proposed requirements during the comment period. Factual information is specifically requested on the following areas of interest:

1. Information about spray-on materials which contain greater than one percent asbestos by weight; asbestos substitutes for use in spray-on materials; the availability of spray-on materials which contain less than one percent asbestos; and technical and economic impacts which could result from implementing the proposed amendments.

2. Information concerning the magnitude of potential emissions of asbestos during spray application of asbestos-containing materials; methods of reducing emissions of asbestos during application; and the friability of spray-on materials after they have been applied.

3. Information on the renovation or demolition of buildings, structures, facilities, or installations which contain friable asbestos materials (containing greater than one percent asbestos); and methods of removal and wetting of the friable asbestos materials.

It is expected that the requested information will allow EPA to assess the economic effects and technical aspects of the proposed requirements. The final amendments will reflect [illegible] drawn from evaluation of [illegible] factual information. EPA will limit the scope of coverage of the final requirements if the data obtained during the comment period justify such a change.

The proposed amendments are as follows:

1. The definitions of the terms "renovation," "removing," and "strippable" would be changed by deleting the phrase "to insulate or fireproof" and "for insulation or fireproofing." This would broaden the applicability of the terms to cover all friable asbestos materials.

2. The paragraphs under the demolition and renovation provisions would be changed by deleting the phrases "insulated or fireproofed," "insulate or fireproof," "insulation and fireproofing," "insulation or fireproofing," and the word "insulate." This would broaden the applicability of the provisions to cover all friable asbestos materials.

3. The spraying provision would be changed by deleting the phrase "to insulate or fireproof." This would broaden the applicability of the spraying regulation to cover the spraying of all asbestos-containing materials.

PUBLIC PARTICIPATION

Interested persons may participate in this rulemaking by submitting written comments (in triplicate) to the Emission Standards and Engineering Division, Environmental Protection Agency, Research Triangle Park, North Carolina 27711, Attention: Mr. Don R. Goodwin. The Administrator will welcome comments on all aspects of the proposed amendments. All relevant comments received on or before May 2, 1977, will be considered. Comments received will be available for public inspection and copying at the EPA Public Information Reference Unit, Room 2922 (EPA Library), 401 M Street, SW., Washington, D.C. 20460.

OTHER ACTION

Elsewhere in this issue of the Federal Register, EPA is issuing a final rulemaking action which clarifies that the renovation and demolition provisions of the asbestos standard apply to materials which contain greater than one percent asbestos, are friable, and were used for fireproofing or insulation on non-load-supporting structural members, such as some ceilings and walls, as well as on load-supporting structural members. This amendment consists of adding a definition for the term "structural member."

(Sec. 112 Clean Air Act as added by sec. 4(a) of Pub. L. 91-604, 84 Stat. 1686 (42 U.S.C. 1857c-7); sec. 114, Clean Air Act, as added by sec. 4(a) of Pub. L. 91-604, 84 Stat. 1687, and amended by Pub. L. 95-319, sec. 6(a)(4), 90 Stat. 269 (42 U.S.C. 1857c-9); sec. 301(a) Clean Air Act, as amended by sec. 15(c)(2) of Pub. L. 91-604, 84 Stat. 1713 (42 U.S.C. 1857g(a)).)

Dated: February 23, 1977.

JOHN QUARLES,
Acting Administrator.

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LAM021697

It is proposed to amend Part 61 of Chapter I, Title 40 of the Code of Federal Regulations as follows:

Subpart B—National Emission Standard for Asbestos

1. Section 61.21 is amended by revising paragraphs (m), (q), and (r) to read as follows:

§ 61.21 Definitions.

• • • • •

(m) "Renovation" means the removing or stripping of friable asbestos materials used on any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member. Operations in which loadsupporting structural members are wrecked or taken out are excluded.

• • • • •

(q) "Removing" means taking out friable asbestos materials used on any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member from any building, structure, facility, or installation.

(r) "Stripping" means taking off friable asbestos materials from any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member.

• • • • •

2. Section 61.22 is amended by revising paragraphs (d), (d)(1)(i), (d)(1)(ii), (d)(2)(iii), (d)(4)(i), (d)(4)(ii), (d)(4)(iii), (d)(4)(iv), (e), and (e)(2) to read as follows:

§ 61.22 Emission standard.

• • • • •

(d) *Demolition and renovation.* The requirements of this paragraph shall apply to any owner or operator of a demolition or renovation operation who intends to demolish any institutional, commercial, or industrial building (including apartment buildings having more than four dwelling units), structure, facility, installation, or portion thereof which contains any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member that is covered or coated with friable asbestos materials, except as provided in paragraph (d)(1) of this section; or who intends to renovate any institutional, commercial, or industrial building, structure, facility, installation, or portion thereof where more than 80 meters (ca. 260 feet) of pipe covered or coated with friable asbestos materials are stripped or removed, or more than 15 square meters ca. 160 square feet) of friable asbestos materials used to cover or coat any duct, boiler, tank, reactor, turbine, furnace, or structural member are stripped or removed.

(1) (A) The owner or operator of a demolition operation is exempted from the requirements of this paragraph: *Provided*, That 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; and (B) the notification requirements of paragraph (d)(2)(iii) are met.

(ii) Written notification shall be postmarked or delivered to the Administrator at least 20 days prior to commencement of demolition and shall include the information required by paragraph (d)(2) of this section, with the exception of the information required by paragraphs (d)(2)(iii), (vi), (vii), (viii), and (ix) of this section, and shall state the measured or estimated amount of friable asbestos materials which is present. Techniques of estimation shall be explained.

(2) • • •

(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 used.

• • • • •

(4) • • •

(i) Friable asbestos materials, used on any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member, shall be removed from any building, structure, facility or installation subject to this paragraph. Such removal shall occur before wrecking or dismantling of any portion of such building, structure, facility, or installation that would break up the friable asbestos materials and before wrecking or dismantling of any other portion of such building, structure, facility, or installation, that would preclude access to such materials for subsequent removal. Removal of friable asbestos materials used on any pipe, duct, or structural member which are encased in concrete or other similar structural material is not required prior to demolition, but such materials shall be adequately wetted whenever exposed during demolition.

(ii) Friable asbestos materials used on pipes, ducts, boilers, tanks, reactors, turbines, furnaces, or structural members shall be adequately wetted during stripping, except as provided in paragraphs (d)(4)(iv), (d)(4)(vi), or (d)(4)(vii) of this section.

(iii) Pipes or ducts, boilers, tanks, reactors, turbines, furnaces, or structural members that are covered or coated with friable asbestos materials may be taken out of any building, structure, facility, or installation subject to this paragraph as units or in sections provided the friable asbestos materials exposed during cutting or disjointing are adequately wetted during the cutting or disjointing operation. Such units shall not be dropped or thrown to the ground but shall be carefully lowered to ground level.

(iv) The stripping of friable asbestos materials used on any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member that has been removed as a unit or in sections as provided in paragraph (d)(4)(iii) of this section shall be performed in accordance with paragraph (d)(4)(ii) of this section. Rather than comply with the wetting requirement, a local exhaust ventilation and collection system may be used to prevent emissions to the outside air. Such local exhaust ventilation systems shall be designed and operated to capture the asbestos particulate matter produced by the stripping of friable asbestos materials. There shall be no visible emissions to the outside air from such local exhaust ventilation and collection systems except as provided in paragraph (f) of this section.

• • • • •

(e) *Spraying.* There shall be no visible emissions to the outside air from the spray-on application of materials containing more than 1 percent asbestos, on a dry weight basis, used on equipment and machinery, except as provided in paragraph (f) of this section. Materials sprayed on buildings, structures, structural members, pipes, and conduits shall contain less than 1 percent asbestos on a dry weight basis.

• • • • •

(2) Any owner or operator who intends to spray asbestos materials which contain more than 1 percent asbestos on a dry weight basis on equipment and machinery shall report such intention to the Administrator at least 20 days prior to the commencement of the spraying operation. Such report shall include the following information: • • •

• • • • •

[FR Doc.77-8060 Filed 3-1-77;8:45 am]

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federal register

WEDNESDAY, MARCH 2, 1977

PART III



ENVIRONMENTAL PROTECTION AGENCY

■

ASBESTOS

Hazardous Air Pollutants National Emission Standards

6113
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Title 40—Protection of Environment

CHAPTER I—ENVIRONMENTAL PROTECTION

[FRL [illegible]]

PART 61—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

Amendment to Asbestos Standard

● [illegible] of this amendment [illegible] and removal [illegible] of the asbestos standard [illegible] material [illegible] and fireproofing [illegible] nonstructural supports [illegible] such as nonload-supporting walls [illegible] as [illegible] structural members. ●

Under section 112 of the Clean Air Act as amended (42 U.S.C. 1857c-7) (the "Act"), the Administrator of the Environmental Protection Agency promulgated the national emission standard for the hazardous air pollutant asbestos on April 6, 1973 (38 FR [illegible]). Amendments to this standard were promulgated on May 3, 1974 (39 FR 15396) and on October 14, 1975 (40 FR 48292). The standard does not include a definition for the term "structural member," and questions have arisen concerning what constitutes a structural member. The definition of "structural member" is therefore being added to 40 CFR 61.21 to clarify that the standard applies to both load-supporting and [illegible] members. [illegible] portion.

The preamble to the [illegible] amendments (38 FR [illegible] October [illegible], 1973) stated that [illegible] 1975, clearly [illegible] cover [illegible] members. No [illegible] is expressed at the time of final promulgation. The amendment promulgated below clarifies EPA's [illegible] and [illegible] future questions on the applicability of the standard.

The Administrator finds that a pre-promulgation public comment period on this amendment would be [illegible] unnecessary or contrary to the public interest" within the meaning of 5 U.S.C. 553(b)(B) because the rulemaking clarifies and interprets an existing regulation does not alter the intent of that regulation, and enables EPA to enforce the existing standard in a consistent and proper manner. Also the Administrator finds that this rulemaking should be effective upon promulgation without a 30-day deferral within the meaning of 5 U.S.C. 553(d), because of the immediate effectiveness required by section 112(b)(1)(C) of the Act and the interpretive nature of this rulemaking.

Other questions have been raised recently about the applicability of the [illegible] standard [illegible] [illegible] EPA [illegible] [illegible] Persons in this case of the Federal Register to regulate [illegible] control.

[illegible] Clean Air Act [illegible] added by [illegible] [illegible] [illegible] [illegible] sec. 114 Clean Air Act as [illegible] [illegible] of Pub. L. 91-604 84 Stat. [illegible] and amended by Pub. L. 93-319 sec. 4 [illegible] 2(b) 42 U.S.C. 1857c-9; sec. 4 Clean Air Act as amended by [illegible] of Pub. L. 95-[illegible] 84 Stat. [illegible] 42 U.S.C. 1857g-a(i).)

Dated February 23, 1977.

JOHN QUARLES,
Acting Administrator.

In Part 61 of Chapter I, Title 40 of the Code of Federal Regulations, § 61.21 is amended by adding paragraph (g) as follows:

Subpart B—National Emission Standard for Asbestos

§ 61.21 Definitions.

. . . . . .

(g) "Structural member" means any load-supporting member, such as beams and load-supporting walls, or any non-load-supporting members, such as ceilings and non-load-supporting walls.

[FR Doc 77-6081 Filed 3-1-77;8:45 am]

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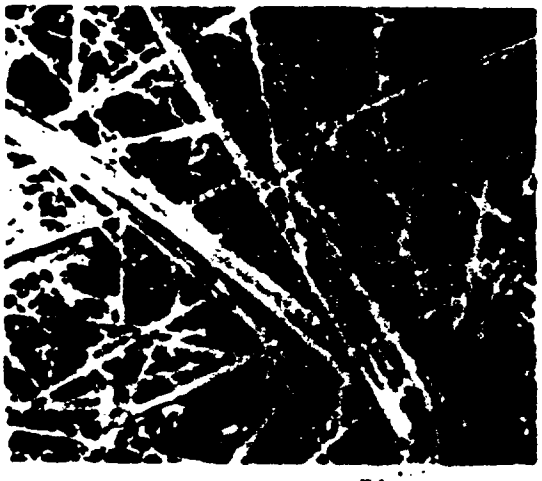
JUN 20 1977

ANNOUNCEMENT



Workshop on Asbestos: Definitions and Measurement Methods

July 18-20, 1977

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About the Meeting

"Asbestos" is the generic name given to a variety of hydrated silicate materials which characteristically exist as fibers. Considerable attention has been given to the definition and measurement of "asbestos", especially in the light of epidemiological studies indicating higher than normal incidence of several diseases among those who work with these materials. As part of an interagency program dealing with the definition and measurement of "asbestos," the National Bureau of Standards of the Department of Commerce and the Occupational Safety and Health Administration of the Department of Labor are sponsoring a workshop at the National Bureau of Standards, Gaithersburg, Maryland, July 18-20, 1977.

The workshop is divided into four topical areas: mineralogical nomenclature, analytical methods, the relationships between chemical and physical properties of fibers and health effects, and regulatory positions and monitoring techniques. The format of the workshop includes presentations of technical papers by invited experts. There will be a general discussion of the material presented during each session at the conclusion of that session. The general discussions will serve to define those factors for which there is general agreement, and what points of controversy exist, and to identify additional research that is required to resolve the remaining problems.

The *Proceedings* of the workshop will be published as soon as possible after the meeting. These *Proceedings* will contain both the formal papers and a summary of the discussions. This document will provide useful information to those currently involved in formulating measurement methods, definitions, and regulatory positions with respect to "asbestos" and other fibrous materials.

GENERAL INFORMATION

Registration

A registration fee of $65 is being charged all attendees to help defray the costs of conducting the workshop and its directly related activities. Advance registration is strongly recommended since space is limited. Please send the attached registration form along with your registration fee (checks made payable to ASBESTOS; no purchase orders, please) to:

Mr. Ronald B. Johnson
Materials Building, Room B348
National Bureau of Standards
Washington, D.C. 20234

The workshop registration desks will be open Sunday evening, July 17, from 7-8 p.m. at the Sheraton-Silver Spring Hotel, and at NBS beginning at 8:30 a.m. on Monday, July 18.

Housing

The Sheraton-Silver Spring Hotel, 8727 Colesville Road, Silver Spring, Maryland 20910 is designated the official headquarters hotel for the workshop. A block of rooms at special rates ($28-Single; $38-Double ~ Twin) has been reserved for workshop attendees. A reservation card is attached which should be forwarded directly to the Sheraton-Silver Spring at the earliest convenience but no later than July 1, 1977. Please use the reservation card rather than calling in your reservation, as this identifies you as a participant and eligible for the special rate.

Transportation

Daily bus service will be provided between the Sheraton-Silver Spring Hotel and the National Bureau of Standards. Buses will leave the hotel at 8:00 a.m. each day, returning at the close of the afternoon session.

Transportation also will be provided from NBS to Dulles International and Washington National Airports at the conclusion of the workshop on Wednesday, July 20.

For those arriving by air, limousine service is available from the area airports to the Sheraton-Silver Spring Hotel.

Meeting rooms

All technical sessions will be held in the Administration Building, National Bureau of Standards, Gaithersburg, Maryland.

Luncheons

Fixed-menu lunches for the participants will be served in a special section of the NBS cafeteria.

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Social Program

A social program has been planned to allow for informal exchanges among the participants. This will include an informal reception on Sunday evening, July 17, concurrent with registration, and a buffet dinner on Monday evening, July 18.

Guests Program

No formal program has been planned for guests accompanying registrants. However, an informal coffee get together room will be open at the Sheraton Silver Spring on Monday morning, July 18 from 9:00-10:30 a.m. Maps, pamphlets of where to eat and where to shop, and general tourist information will be available so that interested persons may plan their own excursions.

Proceedings

A copy of the published proceedings will be sent to all attendees.

For general information, please contact:

Mr. Ronald B. Johnson
Telephone No. (301) 921-2835

For technical information, please contact:

Dr. Cary Gravatt
Telephone No. (301) 921-2852

or

Dr. Kurt Heinrich
Telephone No. (301) 921-2871

TENTATIVE PROGRAM

Sunday, July 17, 1977

7:00-9:00 p.m. **Registration and Informal Reception – Sheraton-Silver Spring**

Monday, July 18, 1977

8:00 a.m. Buses leave from Hotel

8:30 a.m. Registration and Coffee

Welcome to NBS

Purpose and Procedures of Workshop

Philip D. LaFleur
Analytical Chemistry Division
NBS

REGISTRATION FORM

Workshop on Asbestos: Definitions and Measurement Methods

National Bureau of Standards
Gaithersburg, Maryland
July 18-20, 1977

Name _____

Organization _____

Street Address _____

City _____ State _____ Zip _____

Telephone Number _____

( ) Registration Fee Enclosed ($65.00; checks payable to "ASBESTOS")

( ) I cannot attend the workshop but wish to remain on the mailing list for further information on the Proceedings

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Place in envelope with check made payable to "ASBESTOS" and mail to:

Ronald B. Johnson
Materials Building B-348
National Bureau of Standards
Washington D.C 20234

You may have received duplicate copies of this announcement if your name is on more than one mailing list. Please pass any extra copies on to an interested colleague.

GUEST ROOM RESERVATION REQUEST

Name _____

Address _____

City _____ State _____ Zip _____

Reservations must be received not later than two weeks prior to arrival date, and rooms will be held only until 6 p.m. on date of arrival, unless guaranteed in writing. Checkout time is 1 p.m.

Arrival Date _____ Hour _____ a.m. p.m.

Departure Date _____ Hour _____ a.m. p.m.

Singles _____ $36 (Special Conference Rate) _____

Twins _____ $39 (Special Conference Rate) _____

Suite _____

Free Parking – Year Round Pool – Supper Club

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PLACE STAMP HERE

BUSINESS REPLY MAIL

Sheraton Silver Spring
8727 Colesville Road
Silver Spring, MD 20910

Attention: Reservations

I. MINERALOGICAL ASPECTS

Chairman - Brian Mason
Smithsonian Institution
Washington, D.C.

The History of Asbestos Related Mineralogical Terminology
Tibor Zoltai
University of Minnesota
Minneapolis, Minnesota

Fiberous and Asbestiform Minerals
J. R. Kramer
McMaster University
Ontario, Canada

Minerals Commonly Occurring in the Earth's Crust that Might be Defined as Asbestos by Various Regulatory Agencies
Malcolm Ross
U.S. Geological Survey
Reston, Virginia

The Crystal Structures of Amphibole and Serpentine Minerals
Jack Zussman
University of Manchester
Manchester, England

General Discussion of Mineralogical Definitions

II. RELATIONSHIP BETWEEN CHEMICAL AND PHYSICAL PROPERTIES AND HEALTH EFFECTS

Epidemiological Evidence on Asbestos
I. Selikoff and A. Langer
Mt. Sinai Hospital
New York, New York

Factors Relevant to the Assessment of Exposure to Asbestos Dusts
J. Bignon
Université Paris
Centre Hospitalier Intercommunal Poissy
and
P. Sebastien
Laboratoire d'Etude des Particules Inhalés
Paris, France

Review of Epidemiological Evidence of the Effect of Types of Asbestos and Fiber Dimensions on the Production of Diseases in Man
Clark Cooper
Synthetic Environmental Health, Inc.
Berkeley, California

Pathophysiology in Relation to the Chemical and Physical Properties of Fibers
Paul Kotin
Johns Manville Corp.
Denver, Colorado

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Effects of Fiber Size and Shape in Animal Tests
Mearl Stanton
National Cancer Institute
National Institutes of Health
Bethesda, Maryland

NIEHS-Oral Asbestos Studies
J. A. Moore
National Institute of Environmental Health Sciences
Research Triangle Park, N.C.
and
Dave Jones
Illinois Institute of Technology Research Institute
Chicago, Illinois

General Discussion of Health Effects

III. ANALYTICAL METHODS

Chairman - K. Heinrich
Analytical Chemistry Division
National Bureau of Standards

Methods of Identification of Asbestos
William Campbell
Bureau of Mines
College Park, Maryland

TEM Methods
Ian Stewart
McCrone Laboratories
Chicago, Illinois

TEM & Sampling
Don Beaman
Dow Chemical
Midland, Michigan

Light Microscopy
John Dally
McCrone Laboratories
Chicago, Illinois

Electron Microscopy Methods
Clayton Rusel
Denver Research Institute
University of Denver

Analytical Methods Used by NIOSH
Janet C. Haartz
NIOSH-MRE
Cincinnati, Ohio

Statistics and Interpretation of Analytical Results
James Lamoreaux
Johns Manville Corp.
Denver, Colorado

Identification of Asbestiform Minerals in Talc
Robert Norwood
Pfizer, Inc.
Easton, Pennsylvania

Misidentification of Asbestos in Talc
Jerome Krause
Colorado School of Mines
Research Institute
and
William Ashton
J & J Co.
Raritan, New Jersey

General Discussion of Analytical Methods

IV. REGULATORY ASPECTS

MSHA Regulations and Methods
Aurel Goodwin
MSHA
Arlington, Virginia

EPA-Air Sampling and Analysis
Dick Thompson
EPA
Research Triangle Park, N.C.

EPA-Water Sampling and Analysis
Charles Anderson
EPA
Athens, Georgia

OSHA Regulations and Methods
Bower Wrenn
OSHA
Washington, D.C.
and
Willard Dixon
OSHA
Salt Lake City, Utah

FDA Methods
John Wenninger
FDA
Washington, D.C.

CPSC Regulations and Methods
Robert Hahn
CPSC
Washington, D.C.

Impact of Asbestos Regulations on the Mining Industry
C. S. Thompson
Vanderbilt Co.
Norwalk, Connecticut

General Discussion of Regulations

LAM021706

Conference Organizing Committee

C. C. Gravatt, National Bureau of Standards
K. F. J. Heinrich, National Bureau of Standards
S. R. Torrance, National Bureau of Standards
R. E. Johnson, National Bureau of Standards

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B0003581

...Equal Access to Justice Act ... and the ... [illegible] ...

... [illegible] ... cannot be used as state matching funds ...

► ... the general revenue sharing funds provided for the State and Local Fiscal Assistance Act of 1972 as amended

► Funds provided to the state as its matching share under another federal grant

The amendment will appear in a future supplement to the Reference File.

Litigation

COURT RULES MEDICAL EXAMINATIONS REQUIRED FOR WORKERS EXPOSED TO ASBESTOS

Employers whose employees are exposed to airborne asbestos must provide medical examinations for the workers, regardless of the levels of exposure, the U.S. Court of Appeals for the District of Columbia Circuit ruled June 28.

The court's decision in *GAF Corporation v. OSAHRC and Dunlop* (No. 76-1028) affirmed a ruling of the Occupational Safety and Health Review Commission reported at 3 OSHC 1606.

This case arose when the Secretary of Labor charged GAF with violating the asbestos standard, 29 CFR 1910.93a(j) (subsequently renumbered to 1910.1001(j)). The standard requires that employers provide certain preemployment, annual, and separation medical examinations to all workers "in an occupation exposed to airborne concentrations of asbestos."

GAF argued that the commission erred in interpreting the regulation to require medical examinations for employees exposed to the relatively low concentrations of airborne asbestos found in GAF's plants. The employer asserted that the word "concentration" implies a quantitative amount. Because the disputed section does not specify any quantity of asbestos, GAF reasoned that the section should be read to include the five-fiber limit of 29 CFR 1910.93a(b). Rejecting the firm's argument, the court noted that the standard's medical examination requirement is stated in the paragraphs requiring preplacement, annual, and termination examinations. Accordingly, the court concluded that the standard requires medical examinations for all those in occupations exposed to airborne asbestos "in any measurable concentration."

The court also rejected GAF's contentions that the standard is void because it was improperly promulgated, is inconsistent with the Occupational Safety and Health Act, and is arbitrary, irrational and unsupported by the evidence.

In promulgating the standard, the secretary acted reasonably and on substantial evidence in requiring medical examinations for workers exposed to any concentration of airborne asbestos rather than limiting examinations to those exposed to the one-fiber level recommended by the National Institute for Occupational Safety and Health, in the court's opinion.

Further challenging the standard as inconsistent with the Act, GAF contended that the examinations, in effect, are being used as a form of research and that under the Act the Secretary of Health, Education and Welfare (HEW) must pay for medical examinations used as research. However, the court noted, the Act does not require the Secretary of HEW to pay for medical examinations used as research but merely permits him to do so. In addition, the court observed, the examinations are to be provided primarily for the protection of [illegible] employees rather than for [illegible]

Circuit Judge Roger Robb wrote the court's opinion which was concurred in by retired U.S. Supreme Court Associate Justice Tom C. Clark who, after the opinion was entered. A special concurring opinion was filed by Circuit Judge George E. MacKinnon.

In his concurring opinion, MacKinnon suggested that the commission should clarify the standard in question to give other persons subject to it reasonable notice of what measurable quantity of airborne asbestos triggers the medical examination requirement. Regulations that have the great importance that this regulation has to human life should be written in more precise terms — so people of ordinary understanding can determine what course of conduct is being required of them, in MacKinnon's opinion. Nothing would be lost by requiring the commission to state a specific objective standard, and everybody would benefit, MacKinnon added.

This ruling will appear in a future Decisions supplement.

Health Hazards

OSHA MAY ISSUE EMERGENCY TEMPORARY STANDARD ON ACRYLONITRILE

The Occupational Safety and Health Administration is requesting pertinent data on acrylonitrile, a possible carcinogen, to determine if an emergency temporary standard should be issued on the substance.

Acrylonitrile, which is used in manufacturing acrylic fibers, synthetic rubbers, and plastics, has been the subject of recent studies by at least two major manufacturing firms (Current Report, June 30, p. 139).

Results of those studies reaching OSHA indicate that the agency's current standard for the substance may not sufficiently protect exposed employees.

The OSHA request for information appears in the Full Text section of this Current Report.

Program Directives

OSHA ISSUES HYGIENE MANUAL CHAPTER ON RESPIRATORY PROTECTIVE EQUIPMENT

Improper selection of respirators by employers should be cited as a serious violation of Section 1910.134 if a serious exposure to toxic air contaminants is involved, according to Occupational Safety and Health Administration Program Directive 200-9.

The directive, which sets forth guidelines for inspection of respiratory protection equipment, will be added to the OSHA Industrial Hygiene Manual as Chapter 12.

An "acceptable" respirator program, according to the directive, should include 11 requirements. All of these requirements should be considered in inspection of a workplace "where air quality is a potential hazard."

These requirements are:

► The employer should have a written standard operating procedure for the selection and use of respirators during routine operations and in emergencies.

► Respirator selection should be based on the hazards to which the employee is exposed.

► The user should be instructed in the proper use and limitation of respirators.

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- The respirator must be properly fitted
- The respirator must be approved by authorities recognized by OSHA
- The respirator should be used at all times when respiratory protection is required
- Respirators should be cleaned and disinfected as frequently as necessary to ensure the protection of the wearer
- Respirators should be stored in a convenient, clean, and sanitary location
- Respirators used routinely should be inspected during cleaning
- Defective respirators should be repaired by experienced individuals before use
- There should be regular inspection and evaluation to determine the continued effectiveness of the respiratory protection program

According to the directive, employers should consider American National Standards Institute standard ANSI Z88.2 in choosing respirators. In addition, it stated that chemical cartridge respirators should not be used for protection against gaseous material that is extremely toxic in very small concentrations, as the "toxicity is entirely too great to chance the minimum protection afforded by chemical cartridge respirators."

Nor should chemical cartridge respirators be used for exposures to harmful gaseous matter that cannot be detected clearly by odor, the directive explained. The directive further asserted that chemical cartridge respirators should not be used for protection against a substance that fails to meet penetration requirements prescribed in 30 CFR 11.163-8.

Quarter or half-mask chemical cartridge respirators, according to the document, should not be used to protect against any gaseous material in concentrations highly irritating to the eyes.

Serious Citations

Other serious citations should be issued, the directive stated, if:

(1) Employees are exposed to atmospheres immediately dangerous to life or health through lack of training in respirator use.

(2) Employees enter a dangerous atmosphere wearing improperly fitted respirators.

(3) Employees involved in a serious exposure are wearing unapproved or unaccepted respirators.

Generally, violations of respirator inspection requirements should be cited as other than serious, except where emergency equipment is involved, the directive said.

Program directive 300-9 will appear in a future supplement to the Reference File as Chapter 12 of the Industrial Hygiene Manual.

Alkanes

EXPOSURE LIMITS FOR SUBSTANCES RECOMMENDED IN CRITERIA DOCUMENT

The National Institute for Occupational Safety and Health recommended a time-weighted average concentration of 350 mg/cu m as the maximum permissible limit for occupational exposure to individual C5-C8 alkanes or mixtures. The recommendations, which were included in a NIOSH criteria document transmitted to the Occupational Safety and Health Administration also included a suggested ceiling concentration of 1,800 mg/cu m, to be determined on the basis of a 15-minute sampling period (Current Report, April 7, 1977, p. 1392).

The alkanes are used in a variety of industrial processes and include the substances pentane, hexane, heptane, and octane.

The NIOSH recommendations for workplace exposure to alkanes and excerpts for the criteria document appear in the Full Text section of this Current Report.

Variances

CLARK GRAVE VAULT COMPANY APPLIES FOR GUARDRAIL REGULATION VARIANCE

The Occupational Safety and Health Administration granted an interim order to Clark Grave Vault Company, Columbus, Ohio, pending a decision on the firm's request for a variance from OSHA standards for guardrails.

The firm is seeking exemption from OSHA standards 1910.22(c) and 1910.23(c)(3), which require that covers or guardrails be provided to guard open pits, tanks, vats, and ditches, and that galvanizing tanks and similar hazards be guarded by standard railings and toeboards.

The company contends that the erection of a guardrail on its galvanizing tank would interfere with the use of the tank, and that the tank is adequately guarded by its height and ledge width.

Notice of the application for variance and interim order and OSHA's grant of the interim order appears in the Full Text section of this Current Report.

Variances

WEST COMPANY GRANTED INTERIM ORDER FROM POWER PRESS GUARDING STANDARD

The Occupational Safety and Health Administration granted an interim order to West Company, Phoenixville, Pa., pending a decision on the firm's application for a variance from OSHA standards on guarding the points of operation of mechanical power presses.

The firm contended that its use of a safety device not required by the standard results in operation as safe as that specified by the standard, 29 CFR 1910.217(e)(3)(i)(e). The company stated that other safety devices had been evaluated and found less effective than its own method, and cited its excellent safety record while using its own press guarding equipment.

Notice of the application for variance and interim order and OSHA's grant of the interim order appears in the Full Text section of this Current Report.

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General Policy

WIDESPREAD EXPOSURE TO HIGH LEVELS OF RADIOFREQUENCY RADIATION REPORTED

National Institute for Occupational Safety and Health field studies indicate that 75 percent of all workers using radiofrequency sealing and heating equipment are exposed to RF radiation levels exceeding present occupational exposure guidelines, a Senate committee was told on June 28.

Elliott Harris, NIOSH division of biomedical and behavioral science, in testimony before the Senate Committee on Commerce, Science, and Transportation, reported that NIOSH plans to develop a criteria document on RF and

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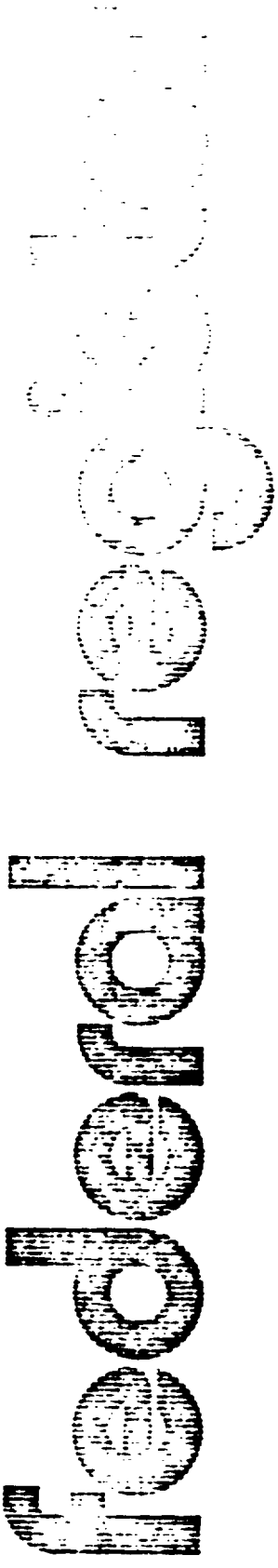
THURSDAY, DECEMBER 15, 1977
PART III





CONSUMER PRODUCT SAFETY COMMISSION

■

CONSUMER PATCHING COMPOUNDS AND ARTIFICIAL EMBERIZING MATERIALS (EMBERS AND ASH) CONTAINING RESPIRABLE FREE-FORM ASBESTOS

Banned Hazardous Products

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Title 16—Commercial Practices

CHAPTER II—CONSUMER PRODUCT

SUBCHAPTER B—CONSUMER PRODUCT

PART 1145—SPECIFIC CONSUMER PRODUCTS

SUBPART A—CONSUMER PATCHING COMPOUNDS AND ARTIFICIAL EMBERIZING MATERIALS (EMBERS AND ASH) CONTAINING RESPIRABLE FREE-FORM ASBESTOS

Consumer Patching Compounds and Artificial Embers (Embers and Ash) Containing Respirable Free-Form Asbestos

AGENCY: Consumer Product Safety Commission.

ACTION: Final rule.

SUMMARY: The Commission issues a final rule declaring consumer patching compounds and artificial embers materials (embers and ash) containing respirable free-form asbestos fibers to be hazardous for the purpose of reducing the risk of cancer associated with inhalation of asbestos fibers. Under the Consumer Product Safety Act (CPSA) rather than under the Federal Hazardous Substances Act (FHSA). Because of the CPSA, a risk of injury [illegible] could be eliminated or reduced to a sufficient extent under the FHSA may not be regulated under the CPSA, unless the Commission finds by rule that it is in the public interest to do so.

EFFECTIVE DATES: For consumer patching compounds containing respirable, free-form asbestos, this rule becomes effective on January 16, 1978. For artificial embering materials (embers and ash) containing respirable free-form asbestos, this rule becomes effective December 15, 1977.

FOR FURTHER INFORMATION CONTACT:

Charles M. Jacobson, Compliance and Enforcement Regulatory Management Division, Consumer Product Safety Commission, Washington, D.C. 20207, 301-433-0400

SUPPLEMENTARY INFORMATION:

Background

On July 22, 1977, by publication of a notice in the FEDERAL REGISTER (42 FR 38782), the Commission proposed a rule under section 30(d) of the Consumer Product Safety Act (CPSA) (15 U.S.C. 2079(d)) as amended, that it is in the public interest to regulate consumer patching compounds and artificial embering materials (embers and ash) containing respirable free-form asbestos under the CPSA rather than under the Federal Hazardous Substances Act (FHSA), (15 U.S.C. 1261-1274). Section 30(d) reads:

A risk of injury which is associated with a consumer product and which could be eliminated or reduced to a sufficient extent under the Federal Hazardous Substances Act * * * may be regulated under the CPSA only if the Commission by rule finds that it is in the public interest to regulate such risk of injury under [the CPSA].

[illegible] proceedings under the CPSA.

3. The Commission believes that civil penalties provisions available under the CPSA against persons who knowingly violate the CPSA also provide additional incentive for compliance under the CPSA. The FHSA does not provide the remedy of civil penalties.

Comments

No comments were received by the Commission which deal directly with the proposed section 30(d) rule. In comments on the proposed ban, however, several persons in the marketing community commented approvingly on the decision to regulate under the CPSA because CPSA does not require repurchase of banned hazardous products by manufacturers, distributors, and retailers. On the other hand, several groups of consumer-oriented interests noted that they would have preferred regulation under FHSA because FHSA provides for such repurchase.

As noted in the proposed section 30(d) rule, the Commission is aware that regulation under CPSA would preclude mandated repurchase of banned hazardous products. However, the CPSA does not preclude voluntary arrangements for repurchase back up the distribution chain. Moreover, the advantages enumerated above, particularly the advantage of having a final banning regulation in force without having to first provide for lengthy adjudicatory proceedings, appears to the Commission to be more beneficial to consumer health and safety than the refunds consumers would have under FHSA. In the matter of artificial embering materials, repurchase under the FHSA would have meant that many persons in the chain of distribution would have handled these materials rather than destroying them quickly in order to avoid additional exposure.

Accordingly, the Commission finds that for the health and safety of consumers, it is in the public interest to regulate consumer patching compounds and artificial embering materials containing respirable free-form asbestos under the CPSA rather than the FHSA. Therefore, pursuant to section 30(d) of

[illegible] compounds
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[illegible] risk of [illegible] related with
[illegible] Commission [illegible] that it
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the CPSA [illegible] compliance

(b) The [illegible] patching compounds containing respirable free-form asbestos are regulated under CPSA

§ 1145.5 Embedding materials (embers and ash) containing respirable free-form asbestos; risk of cancer associated with inhalation of asbestos fibers.

(a) The Commission finds that it is in the public interest to regulate the risk of cancer associated with inhalation of asbestos fibers, from artificial embering materials (embers and ash) containing respirable free-form asbestos under the Consumer Product Safety Act (CPSA) rather than under the Federal Hazardous Substances Act (FHSA) because of the desirability of avoiding possible lengthy, resource consuming, [illegible] rulemaking proceedings under the FHSA, and because of the availability of civil penalties under the CPSA for knowing noncompliance.

(b) Therefore, artificial embering materials (embers and ash) containing respirable free-form asbestos are regulated under the CPSA.

Effective dates: Section 1145.4 becomes effective January 16, 1978. Section 1145.5 becomes effective December 15, 1977.

(Sec. 30(d), Pub. L. 92-573, 86 Stat. 1231 as amended, 90 Stat. 510 (15 U.S.C. 2079 (d)).)

Dated December 12, 1977.

SADYE E. DUNN,
Assistant Secretary, Consumer Product Safety Commission.

[FR Doc 77-36766 Filed 12-12-77; 11:22 am]

[6355-01]

CONSUMER PATCHING COMPOUNDS AND ARTIFICIAL EMBERIZING MATERIALS (EMBERS AND ASH) CONTAINING RESPIRABLE FREE-FORM ASBESTOS

Establishment As Banned Hazardous Products

AGENCY: Consumer Product Safety Commission.

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FOR FURTHER INFORMATION CONTACT

Charles [illegible], Consumer Product [illegible], Compliance and [illegible] Regulatory Management, Washington, D.C. 20207, 301-[illegible].

SUPPLEMENTARY INFORMATION:

BACKGROUND

On July 29, 1977, by publication of a notice in the FEDERAL REGISTER (42 FR 38783), the Commission proposed rules to declare that consumer patching compounds containing asbestos materials for [illegible] of cracks, joints, and holes in [illegible] comparable fixed structures, are banned hazardous products under the Consumer Product Safety Act (CPSA). The rules were proposed because the Commission preliminarily determined that unreasonable risks of injury of certain types of cancer, such as mesothelioma and lung cancer, is associated with inhalable asbestos fibers released from these products. The information on which the Commission's preliminary determination was based is set forth in the proposal. The data in the proposal are incorporated herein by reference. The [illegible] summary of 30 references on which the proposal is based is set forth in the Commission's Public Reading Room, 1111 18th Street, NW., Washington, D.C., Numbers 51-[illegible]. For additional information concerning this rule,

[illegible] CPSA [illegible] [illegible] including [illegible] on October 4, 1977 (42 FR 53970), the Commission extended until November 24, 1977 the time in which it must either [illegible] a consumer product safety rule or withdraw the proposals to ban. This date was further extended until December 12, 1977, by notice published in the FEDERAL REGISTER on November 29, 1977 (42 FR 60752).

COMMENTS ON PROPOSAL

Oral views on the proposal were presented by 7 persons on August 15, 1977 with 3 representing consumer groups and 4 representing manufacturers. In addition, the Commission received 30 written comments which represented 17 manufacturers and 2 distributors; 4 federal agencies; 3 public interest groups; 2 concerned citizens; a supplier of raw materials; and a chemical research and development firm. Among the 10 commenters who expressed support for the ban were 5 manufacturers of patching compounds, 3 federal agencies and 2 public interest groups.

The significant issues raised by the oral and written comments are set forth below.

A. Scope and definition. The proposal states that consumer patching compounds are those that are customarily produced or distributed for sale to or for the personal use, consumption or enjoyment of consumers in or around a household or residence, a school or in recreation or otherwise. The Commission considered in the proposal that patching compounds for application in these consumer environments are either distributed for sale to consumers or are for the personal use or enjoyment of consumers. Moreover,

[illegible] ned to [illegible] ing materials. He believes that CPSA [illegible] only of [illegible] used [illegible] home, but the use of the [illegible] or the interior parts of the structure. He states that [illegible] consumers have access to patching compounds containing respirable [illegible] asbestos that in most manufacturing processes, these products can be considered consumer products under the CPSA. Thus, he believes that it was inappropriate to cite a recent case, ("U.S.A. v. Anaconda Co., et al.," Misc. No. 77-0024, (D.D.C.) June 15, 1977) which indicates that the presence of a product in a consumer environment can help decide whether that product is a consumer product under the CPSA. Therefore, the commenter urges "the Commission in its final regulation to delete" the paragraph on "Anaconda" case in order to "avoid the creation of an unnecessary conflict * * * within the regulation itself."

In response to this comment, the Commission notes that the paragraph which cites the case in question is not in the proposed regulation but in that part of the preamble which explains the regulation. In the preamble, the Commission cited "Anaconda" not in reliance on the case as a basis for regulation but to show how the case interprets the definition of consumer product at section 3(a)(1) of the CPSA which reads,

> The term "consumer product" means any article, or component part thereof, produced or distributed (i) for sale to a consumer for use in or around a permanent or temporary household or residence, a school, in recreation, or otherwise, or (ii) for the personal use, consumption or enjoyment of a consumer in or around a permanent or temporary household or residence, a school, in recreation, or otherwise;

Although courts have not yet reached a definitive decision on the coverage of the term "consumer product," the Commission believes that the statute and legislative history, by themselves, afford sufficient authority for Commission jurisdiction over the defined product and its use in consumer environments. It appears to the Commission that the definition of consumer patching compound in the proposal falls within section 3(a)(1)

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of the CPSA and that the "Amendola" [illegible] the definition.

[illegible] the same conclusion. A law [illegible] and Application to show the [illegible] permitted by the CPSA. That law reads:

[illegible] consumer products are subject to [illegible] Exclusions [illegible] are those with a [illegible] a patching compound for industrial use could [illegible] articles from the ban. [illegible] of the product by consumers is facilitated, it is subject to the ban. Patching compounds which are labeled as marketed solely for industrial use in non-consumer environments are not subject to the ban. In addition to those products which would be sold directly to consumers, the ban applies to patching compounds that [illegible] are used in [illegible] schools, hospitals, public buildings or other areas where consumers have customary access.

It is clear from this language that use of patching compounds in consumer environments determines their status as consumer products, whether the patching compounds are applied professionally or by consumers. And, although the hazard may be greater for professional users of patching compounds because of their repeated exposure, residual dust from sanding during construction or renovation is also a hazard to consumers who may not apply the patching compounds themselves (36).

(b) A manufacturer who supports the ban states that he would have no way of policing the sale of different size containers. Therefore, although he packages a 1-gallon size of patching compound for sale to consumers and a 5-gallon size for commercial-industrial use, he believes the ban should apply to all sizes.

Given the availability of patching compounds to consumers through most marketing channels, the Commission agrees that it would be burdensome for manufacturers and distributors to assure that large sizes of patching compounds, which they claim to be industrial products, are not sold to consumers. Moreover, as noted in the preceding response, merely labeling a patching compound *for* non-consumer use would not exclude such articles from the ban. Where a manufacturer, distributor or retailer fosters or facilitates the product's sale to or use by consumers, the product is considered a consumer product and is within the scope of this ban. This comment indicates that it may be exceedingly difficult to differentiate a patching compound that is a consumer product from one that might be termed a product for industrial use only. Nevertheless, as stated in section 1304.1(e) Scope and Application, "patching compounds which are labeled as, marketed, and sold solely for industrial use in non-consumer environments are not subject to the ban."

3. Regulation of patching compounds by OSHA. A manufacturer of dry-wall joint compounds states that the commercial and professional market for such compounds is already regulated by the Occupational Safety and Health Administration (OSHA) [illegible] of this ban [illegible] not apply to compounds for commercial and industrial use.

As is noted herein, any patching compound containing respirable free-form asbestos that consumers have access to in consumer environments or may purchase would be subject to the ban. Therefore, such products although they may be for industrial commercial use, are also considered to be consumer products.

On the subject of regulation of these products by OSHA, the Commission notes that section 31 of the CPSA provides that the Commission shall have no authority to regulate any risk of injury associated with a consumer product if such risk could be eliminated or reduced to a sufficient extent by actions taken under the Occupational Safety and Health Act of 1970. Under that Act, OSHA has issued regulations which specify the airborne concentrations of asbestos fibers to which any employee may be exposed (29 CFR 1910.93a). However, OSHA regulations apply only to workplaces and not to places where consumers would use the products themselves. Therefore, the Commission considers that actions to regulate this product which can be taken under the Occupational Safety and Health Act of 1970, cannot reduce or eliminate to a sufficient extent the unreasonable risk of injury to consumers that is associated with the product. Accordingly, the Commission regulates this product under the CPSA.

2. Type of patching compound covered by the ban. A manufacturer of caulking, sealing, glazing, adhesive and coating products believes the reputation of his product could be adversely affected by the ban. Although the Commission has stated that the banned product presents a hazard because it is mixed, sanded and moved about during cleanup operations, the commenter believes that the definition of the banned product should specifically exclude the above-listed products because they are designed to remain flexible and are, therefore, not generally sanded. Therefore, the commenter requests that the definition be amended to cover only those compounds, "which after drying are required to be or are normally sanded to a smooth finish."

In response to this comment, the Commission notes that the patching compounds subject to the ban are those that contain asbestos which can be inhaled as a result of mixing, sanding and cleanup operations. Therefore, patching materials such as those listed by the commenter which are not sanded after application because they are intended to remain flexible, would be exempt if they are not available in dry, ready-to-mix form. The Commission believes it is clear that only consumer patching compounds containing asbestos which can be inhaled when the product is in dry form or being sanded are subject to the ban and therefore declines to this case to amend the definition of patching compound at § 1304.1(b).

4. [illegible] for both [illegible] the proposed [illegible] of "silica" [illegible] chemical research and development [illegible] that "silica" is a chemical compound and as a compound is not a component of asbestos. He suggests that the word "silicon" be used to denote that it is a single element which is present in asbestos.

The Commission concurs that the term "silica" should not be used, but rather it should be "silicates," since asbestos is a generic term used to describe a number of naturally-occurring hydrated mineral silicates. Therefore, the word "silica" is deleted from the definition of asbestos in §§ 1304.3(b) and 1305.2(b) below and the word "hydrated silicates" is substituted therefor.

(b) A public interest group takes issue with the definition of asbestos used in the proposal and urges the Commission to adopt a definition of asbestos proposed by OSHA in 1975. The definition of asbestos used in the Commission proposal is based on the definition used by the Bureau of Mines (36). The commenter believes that the OSHA proposed definition could help resolve disputes over the presence or absence of asbestos in consumer products.

As the commenter pointed out, several federal agencies with responsibilities for regulating asbestos (EPA, FDA, OSHA, CPSC) are working toward a uniform definition of asbestos. At a recent workshop, July 18–20, 1977, at the National Bureau of Standards on asbestos definition and identification problems, it was agreed that there should be a uniform definition of asbestos which would be mineralogically correct as well as reflect health concerns. However, there was clearly a lack of agreement on a definition and an interagency agreement on a definition has not yet been reached.

The definition which the commenter urges the Commission to adopt was proposed by OSHA on October 20, 1975; it has not yet been finalized and is subject to change. The OSHA proposed definition reflects OSHA's concern for the health aspects of asbestos and is based on experimental findings associated with fiber morphology (size and shape). The Bureau of Mines also seeks to encourage uniform definition. Their definition which was used by the Commission is based on mineralogical composition. This has been adopted in final form by that agency.

The Commission has reviewed much of the available data on the characteristics of asbestiform mineral fibers and their nonasbestos counterparts. From these data, it would appear that use of the proposed OSHA definition could also include nonfibrous cleavage fragments and other particulate substances, as well as other mineral fibers within the proposed dimension range that are not asbestos fibers. While the Commission is interested in arriving at an unambiguous uniform definition of asbestos, there is not

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gest that a percentage of asbestos contamination by weight [illegible] permitted. The lowest percentage [illegible] by one commenter is 1 percent because the Environmental Protection Agency (EPA) permits the presence of 1 percent asbestos by weight in spray-on asbestos insulation and fire proofing.

As noted in the proposal, the Commission is aware that asbestos is present in the environment. Further, the Commission does not wish to ban all consumer patching compounds in which traces of asbestos are present as a contaminant rather than as an intentionally added substance.

The suggestion that the Commission permit contamination of 1 percent by weight, however, appears to be inappropriate for consumer patching compounds because consumers would not be sufficiently protected. One percent by weight could mean a substantial number of small lightweight asbestos fibers, thus presenting a significant exposure to consumers of respirable free-form asbestos. Therefore, the Commission declines at this time to adopt a percentage by weight to define permissible contamination.

Industry experts do not agree as to the amount of asbestos that might be present in products without deliberately added asbestos. Nor is there agreement on the reliability of the techniques used to measure low levels (below 1 percent) of asbestos by weight. The Commission believes, however, that the use of appropriate quality control measures and careful selection of raw materials can serve to minimize contamination from unintentionally added asbestos (see the Commission's economic impact statement on file at the Office of the Secretary). In order to emphasize that only patching compounds with clearly unavoidable traces of asbestos contamination will be permitted, the Commission defines "intentionally-added asbestos" at § 1304.3(f) of the rule below to mean asbestos which is

(1) added deliberately as an ingredient intended to impart specific characteristics; or (2) contained in the final product as a result of knowingly using a raw material contain-

[illegible]

[illegible] trace amount.

6. *Artificial embarrassing materials*—[illegible] A [illegible] of [illegible] logs [illegible] fire-[illegible] although [illegible] Commission [illegible] to ban [illegible] embarrassing materials containing respirable, free-form asbestos, ref[illegible] in the [illegible] to artificial logs and artificial fireplaces [illegible] adversely on [illegible]. He [illegible], therefore, that [illegible] products, which use an artificial ash bed or vermiculite, be exempted from the ban.

As the commenter noted, the Commission ban applies only to embarrassing materials containing respirable free-form asbestos and not to any artificial logs or artificial fireplaces with which they may be used. Since the banned product is used with artificial logs, it is understandable that questions are raised as to different kinds of artificial logs. The Commission does not believe it would be appropriate to exempt from the ban all electric logs coated with unidentified substances, or all artificial ash used in electric fireplaces, since some of these articles could include the banned product. However, in order to clarify the matter for consumers as well as producers, the Commission adds a statement to § 1304.3(d), the definition of embarrassing materials, which reads, "electric artificial logs and artificial ash beds used in electric fireplaces which do not contain respirable free-form asbestos are not included in this definition."

B. *Effective date.* Six commenters discussed the proposed effective date of the ban of consumer patching compounds which was 30 days after publication of the final rule. Five manufacturers suggested a date later than 30 days after publication. A public interest group suggested that the effective date be the date of publication of the final rule.

(1) One commenter suggested that the Commission consider a series of effective dates for the ban on consumer patching compounds: 30 days for manufacturers, 90 for distributors and 180 days for retailers in order to clear inventories. Several commenters believe that a 30-day effective date might prove burdensome to small manufacturers because of the inventory problem.

The matter of inventories was considered in the July 29, 1977 proposal to ban and further discussed at the public meeting of August 15, 1977. The concern of those involved to clear their existing inventories of consumer patching compounds containing respirable free-form asbestos was considered. Information available to the Commission indicates that manufacturers are now maintain-

[illegible]

2. Commission considered [illegible] impact [illegible] [illegible] adverse effects of exp[illegible] to [illegible] asbestos [illegible] the manufacture, distribution and [illegible] to consumers of patching compounds until 180 days after publication of [illegible]. It appears to the Commission that early discontinuance of the manufacture of this product would be necessary in order to stop its continuing production in the market. On the other hand, substantial adverse economic impacts could result from the freezing of distributors' and retailers' inventories at an early effective date. The Commission concludes therefore that the ban should become effective at two different points in time. For manufacturers, the effective date should be close to publication of the rule in order to stop the continuing manufacture of the product. For distributors and retailers, the effective date should be delayed to help ameliorate adverse economic impacts.

Therefore, the Commission declares below at § 1304.4 that consumer patching compounds containing respirable free-form asbestos which have been manufactured or initially introduced into commerce 30 or more days after publication of this rule are banned hazardous products. This means that a banned hazardous product, having been manufactured or initially introduced into commerce, retains its status as a banned hazardous product; thus, its subsequent sale, offering for sale, or distribution in commerce, is prohibited by any person in the chain of distribution. In addition, the Commission declares that all other consumer patching compounds containing respirable free-form asbestos, no matter when manufactured or initially introduced into commerce, are banned hazardous products 180 or more days after publication of this rule. (As stated below in § 1304.4(g) of the rule, initial introduction into commerce of this product occurs when the product is physically shipped from a manufacturer's facility to a distributor, retailer, consumer or to another person for application in a consumer environment.)

In summary, 30 days after publication of this rule, manufacturers will be prohibited from manufacturing or shipping the product to distributors, retailers, consumers, or to others for application in consumer environments. Further, 180 days after publication of this rule, distributors and retailers will be prohibited from selling, offering for sale, or distributing any of the described products, no matter when manufactured or initially introduced into commerce, to distributors, retailers, consumers or to others for application in consumer environments.

(2) The public interest group recommends that the effective date of the ban

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... ...mission proposed that the ef... ... of the ... artificial em... ... ...ials be ... ... of publica... ... the Administrative Proce... ...5 USC ... which governs ... ... of consu... ...oduct safety ... ...s that ... ...d be pub... ... ...ions befo... ...effective date un... ... Commi... ...ld waive to ... other ... ... patching co... ... where ... to asbestos f... most prev... during mixing, sa... and cle... ...ations, alt... ...fibers ... ...ntained and ... for ... ...rable ... ...f time, ... be ... ...m embe... ...rials can be re... ...as long as ... ...rials are in th... ...e because ... are always in dry ... and read... ...moved about by ... ...y household ... ...currents. It ... to the Co... ... therefore, that ... embe... ...rials should be ... ...ed from co... ... as quickly as pos... ...and that there ... good cause to have ... ...n effective ... ...ate of publi... ... To assist ... ...who already had ... ...h materials ... ...e homes, the Co... ...sion, on July ... 1977, issued a pres... ...ase on the ... ...r ... ...h which incl... ... Consume... ...rtising consu... ...of the dan... ...s associated with the ... ...ching ma... ... and issuing ... ...ns for their ... removal.

... ...ic advise ... the Commission ... ... in addition ... ...t no significant ... ...economic impa... ... are anticipated ... ...result of the ...mmediate effective dat... ...ulfamic materials (51). As is ... in the forego... discussion, the ec... ... impact of a 30-day and even a ... ... effective date for patching co... ...s would be significant and the ... ...t appears that the economic ... ...of an immediate effective date w... ... more signi... ...since no new ... ...tion has been ... ...ted to show ... ...earlier effective date should be pro... ...d, the Commission declines ... ...ation of ... ...public interest gro... ...Therefore, the ... ...e date of the ... ...on consu... ...patching compo... containing re... ...the free-form ... ...is 30 days ... publication of ... ... as to manufacture and initial in... ... into commerce and 180 d... ... publication as to all other ... ...the defini... ...roduct no matter wh... ...anufactured or initially introdu... ...commerce.

Comments on risks and risk assessment. ... ...comments ... ...d the Commi... ...risk asse... ...for patching co... ...ds and que... ...ed other aspects of ... ...hazard.

(1) A manufacturer ... ...ents that use by the general pu... or by asbestos wo... ...is not hazardous and that the gre... ...t hazard is to a worker during ... ...operations if he also smokes.

The Commission ... ...that while data fro... ...an epidemiol... ...al study of asbestos ... ...ation workers indicated there was ... increased risk of death from lung ... ...

[illegible] that some [illegible] have a [illegible] percentage of [illegible] which were used [illegible] mission [illegible] ment, [illegible] one [illegible] exposure [illegible] limited [illegible] a [illegible] smaller [illegible] on this [illegible] other risk [illegible] results [illegible] compound [illegible] may reduce but does not eliminate the risk of deaths due to exposure to asbestos in patching compounds. The range is from 1 death per million persons exposed for the projected five years exposure using one model and up to 223 lifetime excess cancer mortality deaths per million persons exposed during another model (53). It should be noted here that while asbestos levels may vary, they do not change the fact that there is no known level below which inhalable asbestos may be considered safe.

(c) Another commenter says that using a premixed compound reduces the consumer's exposure to asbestos. The commenter also thought that the Commission's estimate of consumer exposure was too high. The Commission's risk assessment analysis did take into consideration the exposure during the mixing of a patching compound. While exposure to asbestos fibers would be negligible during slight stirring of a premixed compound, the exposure during the sanding and cleaning operations involved would be the same as for the dry compound. Consequently, the risk assessment values would not be significantly reduced. As for the four-day, eight-hour exposure being too high an estimate, no data were submitted to substantiate that contention. As stated in the proposal, therefore, it appears to the Commission that although the exposure may be high, it is a reasonably foreseeable exposure.

D. *Substitutes for asbestos.* The July 29, 1977 proposal notes that substitutes for asbestos are already being used in patching compounds. One of the most common substitutes is attapulgite, a fibrous clay. Other substitutes of a fibrous nature are wollastonite, kaolinite, sepiolite and bentonite. Several comments express concern that materials used as substitutes for asbestos may also pose hazards.

The Commission shares this concern. Substitutes for asbestos have been under consideration for only a short time. Little data are available on which to evaluate the safety of substitute materials. Experimental findings of Stanton (58) indicate that many mineral fibers (in addition to asbestos) of small respirable di- [illegible] [illegible] [illegible]

[illegible] difference in [illegible]

As [illegible] stated previously, the Commission proposed a ban on the manufacture for sale, sale, and distribution in commerce, and importation into the United States of consumer patching compounds containing respirable free-form asbestos fibers. The Commission is aware that technology for producing asbestos-free patching compounds and other products containing asbestos fibers is becoming more widely available. The economic impact of this ban will vary from time to time depending on the formulation technology becoming more widely used and as certain recent formulations are improved by manufacturers. The nature and extent of the economic impacts are discussed in the Environmental and Economic Assessments now on file in the Office of the Secretary and were considered by the Commission during this rulemaking process.

F. *Other comments.* (1) Several commenters suggested that the Commission should investigate other products containing asbestos in order to determine the existence of possible hazards.

In the proposal, the Commission noted that information on other products containing inhalable asbestos would continue to be developed in order to determine whether further regulation is necessary. Accordingly, the staff has begun to develop plans for collecting such information.

(2) One commenter suggested that the Commission issue a rule that would prohibit stockpiling of the banned products.

Section 9(d)(2) of the CPSA provides that the Commission may, by notice and comment rulemaking, prohibit a manufacturer from stockpiling a product for which a consumer product safety rule has been promulgated. In this case, the ban on consumer patching compounds covers the manufacture and initial introduction of products into commerce 30 days after promulgation; the ban on artificial emberizing materials covers products in commerce on the date of promulgation. Therefore, in practical effect, there would not be time for manufacturers to stockpile; nor would there be time prior to these effective dates for notice and comment rulemaking.

(3) A commenter expressed concern that the banned products be kept out of international commerce.

The Commission notes that this comment is directed not to the proposed rule but to its enforcement. If this matter should become a problem it would be considered in the context of enforcement.

(4) Several comments suggested editorial changes in the proposal. These suggestions were considered and, where appropriate, have been included herein.

Description of the Ban

The banned products. Parts 1304 and 1305 declare, respectively, that consumer patching compounds and artificial emberizing materials (embers and ash) [illegible]

[illegible]

[illegible]

[

[illegible] to [illegible] [illegible] [illegible]

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Conclusion

Upon consideration of the published proposal, the oral and written comments to the proposal, and other relevant material in the Commission's files, the Commission concludes that consumer patching compounds and artificial fireplace logs containing respirable free-form asbestos fibers (fibers 5 microns and longer as set forth below) present an unreasonable risk of injury and that the Commission should promulgate a rule banning the manufacture, sale, and distribution of these products. The Commission also concludes that the ban should not apply to products containing asbestos fibers that are not respirable free-form asbestos fibers, to products containing asbestos fibers that are not free-form asbestos fibers, or to products containing respirable free-form asbestos fibers that are not consumer products. The Commission concludes that the ban should not apply to products containing respirable free-form asbestos fibers that are used in industrial settings or in commercial buildings, such as factories, warehouses, or office buildings, where consumers do not have customary access.

Accordingly, pursuant to provisions of the Consumer Product Safety Act (sections 8 and 9, 86 Stat. 1215-17, as amended, 90 Stat. ... 15 U.S.C. 2057, 2058), new Parts 1304 and 1305 are added to Title 16, Chapter II, Subchapter B, as follows:

PART 1304—BAN OF CONSUMER PATCHING COMPOUNDS CONTAINING RESPIRABLE FREE-FORM ASBESTOS

Sec.

1304.1 Scope and application.
1304.2 Purpose.
1304.3 Definitions.
1304.4 Consumer patching compounds as banned hazardous products.
1304.5 Findings.

AUTHORITY: Sections 8, 9, 86 Stat. 1216-1217, as amended 90 Stat. 503, 15 U.S.C. 2057, 2058.

§ 1304.1 Scope and application.

(a) In this Part 1304 the Consumer Product Safety Commission declares that consumer patching compounds containing intentionally-added respirable free-form asbestos in such a manner that the asbestos fibers can become airborne under reasonably foreseeable conditions of use, are banned hazardous products under sections 8 and 9 of the Consumer Product Safety Act (CPSA) (15 U.S.C. 2057 and 2058). This ban applies to patching compounds which are (1) used to cover, seal or mask cracks, joints, holes and similar openings in the trim, walls, ceiling, etc. of building interiors, which after drying are sanded to a smooth finish and (2) are produced and distributed for sale to or for the personal use, consumption or enjoyment of consumers in or around a permanent or temporary household or residence, a school, in recreation or otherwise.

(b) The Commission has found that (1) these patching compounds are being or will be distributed in commerce; (2) that they present an unreasonable risk of injury; and (3) that no feasible consumer product safety standard under the CPSA would adequately protect the public from the unreasonable risk of injury associated with these products. This rule applies to the banned hazardous products defined in section 1304.3 and described further in section 1304.4.

(c) Only consumer products are subject to this regulation. Patching compounds which are consumer products include those which a consumer can purchase. Merely labeling a patching compound for industrial use would not exclude such articles from the ban. If the sale or use of the product by consumers is facilitated, it is subject to the ban. Patching compounds which are labeled as, marketed, and sold solely for industrial use in non-consumer environments are not subject to the ban. It is unlawful to use these products in consumer environments. The Commission will take action, including ... against companies distributing patching compounds containing respirable free-form asbestos which are used in residences, schools, hospitals, public buildings or other areas where consumers have customary access.

§ 1304.2 Purpose.

The purpose of this rule is to ban consumer patching compounds containing intentionally added respirable, free-form asbestos. These products present an unreasonable risk of injury due to inhalation of fibers which increase the risk of developing cancer, including lung cancer and mesothelioma, diseases which have been demonstrated to be caused by exposure to asbestos fibers.

§ 1304.3 Definitions.

(a) The definitions in section 3 of the Consumer Product Safety Act (15 U.S.C. 2052) apply to this Part 1304.

(b) "Asbestos" means a group of mineral fibers composed of hydrated silicates, oxygen, hydrogen, and other elements such as sodium, iron, magnesium, and calcium in diverse combinations and are: Amosite, chrysotile, crocidolite, anthophyllite asbestos, actinolite asbestos, and tremolite asbestos.

(c) "Free-form asbestos" is that which is not bound, or otherwise "locked up" in a product by resins or other bonding agents, or which can readily become airborne with any reasonably foreseeable use.

(d) "Patching compounds" are mixtures of talc, gypsum, clays, mortar, ground marble, lime or other similar materials and a binding material such as asbestos which are sold in a dry form, ready to be mixed with water, or ready-mixed in ready-mix paste form.

(e) "Consumer patching compounds" are those that are customarily produced or distributed for sale to or for the personal use, consumption or enjoyment of consumers in or around a permanent or temporary household or residence, a school, in recreation or otherwise. The Commission considers that patching compounds for application in these consumer environments are other articles used for sale to or use for the personal use or enjoyment of consumers.

(f) "Intentionally-added asbestos" is asbestos which is (1) added and contained in an ingredient intended to impart specific characteristics or (2) encouraged by the final product or the result of knowingly using a raw material containing asbestos. Whenever a manufacturer finds out that the finished product contains asbestos, the manufacturer will be considered to be knowingly using a raw material containing asbestos, unless the manufacturer takes steps to reduce the asbestos to the maximum extent feasible.

(g) "Initial introduction into commerce" occurs when the manufacturer ships a product covered by this regulation from a facility of the manufacturer to a distributor, retailer, or user.

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§ 1304.4 *Consumer patching compounds as banned hazardous products.*

On the basis that asbestos fibers present the hazards of cancer, including lung cancer and mesothelioma to the public, consumer patching compounds containing intentionally added, respirable (respirable asbestos which have been manufactured or initially introduced into commerce after January 16, 1978 are banned hazardous products. In addition, all other consumer patching compounds containing intentionally-added, respirable free-form asbestos no matter when manufactured or initially introduced into commerce, are banned hazardous products after June 11, 1978.

§ 1304.5 *Findings.*

(a) *The degree and nature of the risk of injury.* The Commission finds that the risk of injury which this regulation is designed to eliminate or reduce is from cancer, including lung cancer and mesothelioma. In assessing the degree and nature of the risk of injury to consumers, the Commission has reviewed experimental data and human experience information. The Commission noted that in the scientific literature, there is general agreement that there is no known threshold level below which exposure to respirable free-form asbestos would be considered safe. Further on the basis of such scientific opinion, it appears to the Commission that children are particularly vulnerable to carcinogens because of their longer potential lifetime and their rapid rate of growth. In areas of the country where asbestos may not be prevalent in the environment, the major risk of exposure for children and others may occur in the household. In areas of the country where many asbestos fibers are present in the environment, the public is subject to additional risks from the presence of asbestos fibers in households and other consumer environments. The Commission concluded on the basis of these factors that consumer patching compounds containing respirable free-form asbestos present an unreasonable risk of injury to the public. In addition, a risk comparison was made. For purposes of this comparison, the Commission considered the use of patching compounds by the consumer for six hours a day four times a year, to be a high yet reasonably foreseeable exposure. The increased risk of death from respiratory cancer [illegible] is estimated at [illegible] 1000 per million. For [illegible] years of these levels, [illegible] theoretically and in fact [illegible] from 1,000 and 10,000 [illegible] lower estimate of 30 per [illegible] to the actual risk for a [illegible] years. Nevertheless, in view of the [illegible] nature of the injury and the cumulative effects of asbestos exposure, even this minimum figure represents an unreasonable risk. The Commission believes that reducing exposure to respirable free-form asbestos in the home represents a substantial decrease in risk to consumers, since, for many people, the major exposure to inhalable asbestos is in the home.

(b) *Products subject to the ban.* Consumer patching compounds, defined in § 1304.2(c)(1), (2), (3), and (4), include such products as all spackling compounds and taping and patching compounds (commonly known as "spackle," "drywall," or "ready-mixed joint mud"). The Commission estimates annual shipments of patching compounds subject to the ban at approximately 30–50 million "units," or individual packages, of various sizes from 0.5 to 25 pounds (dry) or 0.5 to 3 gallons (wet). The Commission believes that about half the patching compounds sold in 1977, and intended for sale to or use or enjoyment by consumers, were formulated with asbestos. Many others contained significant levels of asbestos contamination and also will be affected by the ban.

(c) *Need of the public for the products and effects of the rule on their utility, cost and availability.* Patching compounds, though used primarily by commercial construction workers, are also used by consumers, and are used for the patching and sealing of cracks and joints in and around the household and in other consumer environments either by consumers or professional applicators. The compounds are used to cover seams on gypsum drywall which might otherwise be aesthetically undesirable or which might lead to structural damage, energy loss or lower property value. The asbestos in these compounds acts as a structural reinforcing agent which helps to reduce cracking and shrinkage of the compound over time, and which renders the compound more pliable or "workable" upon application.

(1) *Utility.* The elimination of asbestos from these products may result in the increased use of new developments of substitute which have similar properties to those of asbestos, or which would perform adequately for the purpose to be served. In some circumstances, asbestos is required by a combination of characteristics that [illegible] substitutes. [illegible] [illegible] [illegible]

limiting the ban to intentionally added asbestos. Other alternatives such as limiting the scope of the ban only to products purchased and used by consumers or to issuing a ban with a later effective date, were considered by the Commission. However, none was found that would cause less disruption or dislocation of manufacturing and other commercial practices, consistent with public health and safety.

Conclusion. The Commission finds that this rule, including its effective date is reasonably necessary to eliminate or reduce the unreasonable risk of injury from cancers such as lung cancer and mesotheliomas that are associated with the banned products described herein, that no feasible consumer product safety standard under the Consumer Product Safety Act can adequately protect the public from this risk, and that promulgation of this rule is in the public interest.

PART 1305—BAN OF ARTIFICIAL EMBERIZING MATERIALS (ASH AND EMBERS) CONTAINING RESPIRABLE FREE-FORM ASBESTOS

Sec.
1305.1 Scope and application.
1305.2 Purpose.
1305.3 Definitions.
1305.4 Artificial fireplace ash and embers as banned hazardous products.
1305.5 Findings.

Authority: Secs. 2, 3, 30(d), Pub. L. 92-573, as amended, Pub. L. 94-629, 90 Stat. 3018–17, as amended, 90 Stat. 390 (15 U.S.C. 2057, 2080).

§ 1305.1 Scope and application.

In this Part 1305 the Consumer Product Safety Commission declares that artificial emberizing materials (ash and embers) containing respirable free-form asbestos generally packaged in an emberizing kit for use in fireplaces, and designed for use in such a manner that the asbestos fibers can become airborne under reasonably foreseeable conditions of use are banned hazardous products under sections 2 and 3 of the Consumer Product Safety Act (CPSA) (15 U.S.C. 2057 and 2058). This ban applies to artificial emberizing materials sold in separate kits or packaged with artificial fireplace logs for use in fireplaces and designed or created by consumers to be used with artificial logs to simulate live embers of wood and give a [illegible] appearance. Products subjected to high temperatures during the manufacture of material containing asbestos and sold separately to be assembled with artificial logs by consumers and glowing ashes and embers within the scope of this ban.

§ 1305.2 Purpose.

The purpose of this rule is to ban artificial emberizing materials containing respirable free-form asbestos. These products present an unreasonable risk of injury due to inhalation of fibers which increase the risk of developing cancers such as lung cancer and mesotheliomas, diseases which have been demonstrated to be caused by exposure to asbestos fibers.

§ 1305.3 Definitions.

(a) The definitions in section 3 of the Consumer Product Safety Act (15 U.S.C. 2052) apply to this Part 1305.

(b) "Asbestos" means a group of mineral fibers consisting of hydrated silicates, oxygen, hydrogen and other elements such as sodium, iron, magnesium and calcium in diverse combinations and are: Amosite, chrysotile, crocidolite, anthophyllite asbestos, actinolite asbestos, and tremolite asbestos.

(c) "Free-form asbestos" is that which is not bound, woven, or otherwise "locked-in" to a product by resins or other bonding agents, or those from which fibers can eventually become airborne with any reasonably foreseeable use.

(d) "Emberizing materials" means an asbestos-containing material generally packed in an "emberizing" kit to be placed under artificial logs in gas-burning fireplace systems or in artificial fireplaces for decorative purposes. The product is also glued to artificial logs, either at a factory or by a consumer using an emberizing kit. (Synthetic logs manufactured of cellulose products which are consumed by flames are not included in this definition. Electric artificial logs and artificial ash beds used in electric fireplaces, which do not contain respirable free-form asbestos are not included in this definition.)

§ 1305.4 Artificial fireplace ash and embers as banned hazardous products.

On the basis that airborne asbestos fibers present the hazards of cancer such as lung cancer and mesotheliomas to the public, artificial fireplace ash and embers containing respirable free-form asbestos are banned hazardous products.

§ 1305.5 Findings.

(a) The degree and nature of the risk of injury the Commission finds associated with the products which this regulation declares [illegible] hazardous are based on the following findings and the [illegible] of information set forth in the preamble to this regulation. Specifically, [illegible] Silicon, Incidence of Cancer among Insulation Workers, Asbestos Exposure and Neoplasia, Asbestos Exposure and Cancer of Various Sites, Asbestos Exposure and Cancer Risk, Asbestos Exposure and Cancer Risk: A Quantitative Assessment, Asbestos Exposure and Cancer Risk: A Quantitative Assessment, Asbestos Exposure and Cancer Risk: A Quantitative Assessment

reasonably necessary to eliminate or reduce the unreasonable risk of injury from cancers such as lung cancer and mesothelioma that are a society from the banned products described herein, that no feasible consumer product safety standard under the Consumer Product Safety Act can adequately protect the public from this risk, and that promulgation of this rule is in the public interest.

Effective Dates: Part 1304 becomes effective January 16, 1978.

Part 1305 becomes effective December 15, 1977.

Dated: December 12, 1977.

SADYE E. DUNN,
Assistant Secretary, Consumer Product Safety Commission.

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By J P Coates

IR analysis of toxic dusts

ANALYSIS OF COLLECTED SAMPLES OF ASBESTOS PART TWO

PART I (November, page 105) presented well-defined ir methodologies for quartz dust and these procedures included computer data processing. The presentation here continues by summarizing the state-of-the-art of applying infrared spectroscopy to asbestos dusts.

General considerations

The application of infrared spectroscopy to asbestos is not as widely documented as the methods used for the control and analysis of quartz. One reason is that the occurrence of asbestos is far more widespread than quartz since it is encountered as different forms in many industrial and consumer products. Additionally, the problem is not limited to airborne-dust analysis because it is often necessary to identify asbestos in a solid bulk matrix. Therefore, before the analytical procedures are discussed it is important to consider the following points:

1. Classification of asbestos type
2. Health hazards associated with asbestos
3. Commercial applications of asbestos
4. Analytical requirements for the identification and control of asbestos

These points are outlined below; for more comprehensive coverage see Refs. 1-8.

Classification of asbestos type

Asbestos is a collective name given to a number of naturally occurring complex, crystalline, fibrous silicates. They are derived mainly from one group of minerals known as amphiboles with the exception of the most abundant form, chrysotile (white asbestos), which is classified in the serpentine group. The common asbestiform minerals are given

Mr Coates is Chief Applications Chemist, Spectroscopy, Perkin-Elmer, Ltd. The author wishes to acknowledge M J Lewis and P Dublon for their assistance in the preparation of some of the data presented in this article. Also I. Timbrell is thanked for helpful discussions and for supplying the asbestos samples.

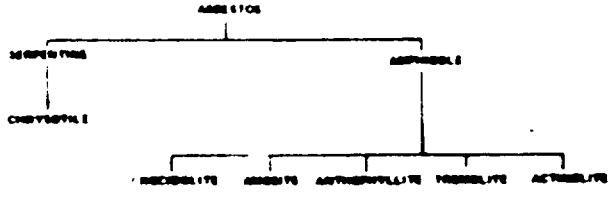

Figure 1

in *Figure 1*.

Each of the amphiboles is characterized by the presence of different cationic groups, and for reference purposes the approximate molecular formulas are given in *Table 1*.

The crocidolite (blue asbestos) has a characteristic blue color that has been attributed to the presence of sodium ions, although the mixed valencies of iron could also be a contributing factor.

Health hazards associated with asbestos

The greatest hazard from asbestos is the inhalation of the fine dust fibers and their retention in the lung and bronchial passages. Specific medical conditions caused by asbestos dust have been identified and the principal diseases associated with prolonged exposure are asbestosis (a thickening and scarring of lung tissue), lung and bronchial cancers, and mesotheliomas (specific tumors related to the amphi-

Table 1

Asbestos	Approximate formula[a]
Chrysotile	$Mg_3Si_2O_5(OH)_4$
Amosite	$(Fe(II)/Mg)_7\ Si_8O_{22}(OH)_2$[b]
Anthophyllite	$(Mg/Fe(II))_7\ Si_8O_{22}(OH)_2$[b]
Crocidolite	$Na_2Fe_3(II)\ Fe_2III\ Si_8O_{22}(OH)_2$
Tremolite[c]	$Ca_2\ Mg_5\ Si_8\ O_{22}\ (OH)_2$

[a]Data obtained from Ref. 9

[b]Variable Fe(II) Mg ratio the predominant element is placed first in the formula.

[c]Data obtained from Ref. 1

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holes). Particle size and shape play an important role in the inhalation and lung penetration mechanisms, especially with the amphibole fibers [7-11]

Commercial applications of asbestos

The acid, water, and heat resistant properties of asbestos are exploited in the manufacture of a wide range of products. Its major application is in the building industry for concrete reinforcement and heat and electrical insulation. Additionally, however, it is used in certain industrial products such as gaskets, brake and clutch components, protective clothing, etc., and in domestic goods, e.g., heating and electric appliances.

Most products made in Great Britain that require the use of asbestos are manufactured from chrysotile. Importation of crocidolite, commercially the most important amphibole, has been prohibited since 1970. Although legal restrictions are imposed on the use of this material, it can still be encountered in certain imported products and products manufactured in the U.K. before the introduction of legislation; this also applies to buildings erected before this time.

Analytical requirements for the identification and control of asbestos

The analytical procedure selected for the examination of asbestos or asbestos products is dependent on the physical form of the sample and the information required. Samples presented for analysis can be grouped into three basic categories:

1. Airborne dust collected on suitable filters, found in process industries, building and demolition sites, public areas, and mining areas
2. Single fibers, manufactured products; biological tissue; air samples
3. Composite or bulk samples presented as mixtures with other compounds or types of asbestos, mineral assay samples; manufactured products; building materials; biological samples

Generally, the information required from these sample groups is characterization of asbestos type, quantity of asbestos present and/or relative proportions of individual asbestos types present in mixed forms. In all cases there is the possibility of an interfering matrix. Several techniques have been proposed to give this information; these include x-ray methods, optical and electron microscopy, particle size/shape analysis, and thermal methods (especially DSC/DTA).

While most of these methods give excellent data for specific analyses, there is no single method that can be used on a general basis. Microscopy probably gives the most precise data for fiber characterization/fiber count and is currently accepted as one of the standard procedures. The techniques, however, are often time-consuming and usually require highly trained operators.

Some work has been published on the use of infrared spectroscopy for the study and analysis of asbestos.[12-18] These include quantitative procedures that have been developed for the chrysotile form.[12-17] In principle, with careful attention to sample preparation and in certain cases the aid of computer processing, it is possible to satisfy the requirements listed earlier for the different sample categories by infrared spectroscopy and to develop well-defined ir analytical methodologies as now exist for quartz (Part I of this article). The remaining sections of this article illustrate the type of information that can be obtained for asbestos by this technique.

Application of infrared spectroscopy

General appearance and interpretation of the asbestos spectrum

All types of asbestoses exhibit intense absorptions in the 1200–900 cm^{-1} and 600–300 cm^{-1} regions of the infrared spectrum. Additional weaker but characteristic bands are observed between 850 and 600 cm^{-1} for the amphiboles. Most of these bands below 1200 cm^{-1} are attributed to Si-O stretching and bending vibrations and the large number of these vibrations is equated to the different types of Si-O groups and their association with various cations.

Relatively few spectral data have been published on this region of the asbestos spectrum. Lazarev[19] gives frequency correlations and vibrational assignments for some of the amphiboles and relates the data to the structure of the basic $(Si_4O_{11})_n$ unit. With the exception of the above work, most spectra have been acquired on old instrumentation that has limited studies to 650 and sometimes 400 cm^{-1}. The maximum information for qualitative identification of asbestos type is gained by recording the spectrum to 200 cm^{-1}. This is illustrated in *Figure 2* which shows a clear comparison between chrysotile and crocidolite asbestos. The other amphiboles exhibit equally well-defined and characteristic infrared spectra. From inspection of these spectra it is possible to extract characteristic frequencies from the individual asbestos and to produce a simplified flow diagram to aid identification. (*See Figure 3*).

Above 1200 cm^{-1} there are weak absorptions

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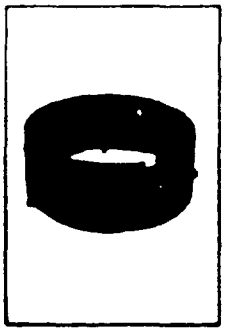
accessories



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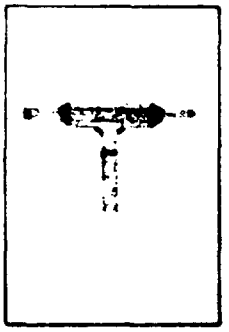

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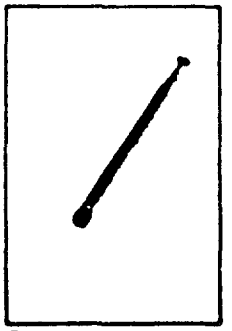

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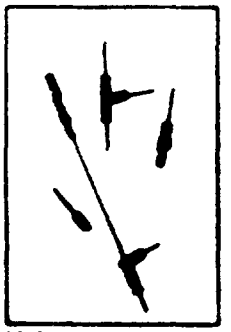

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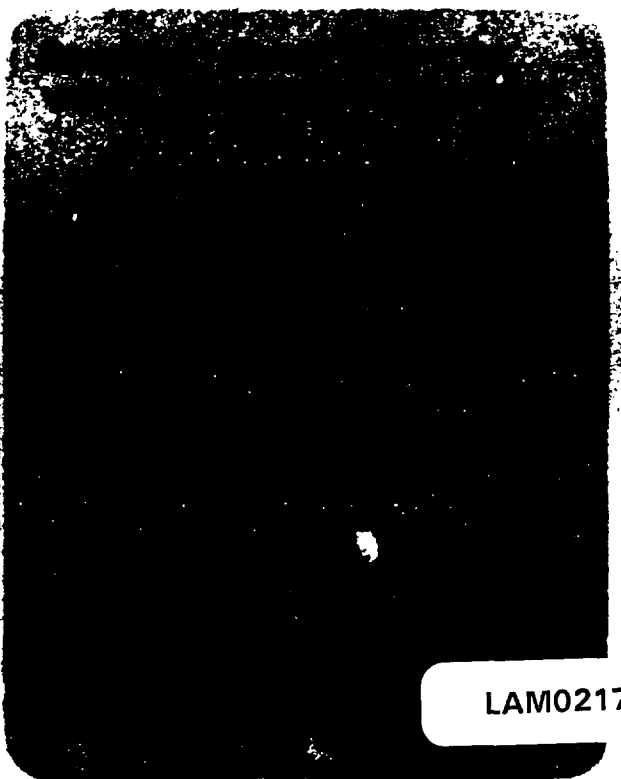

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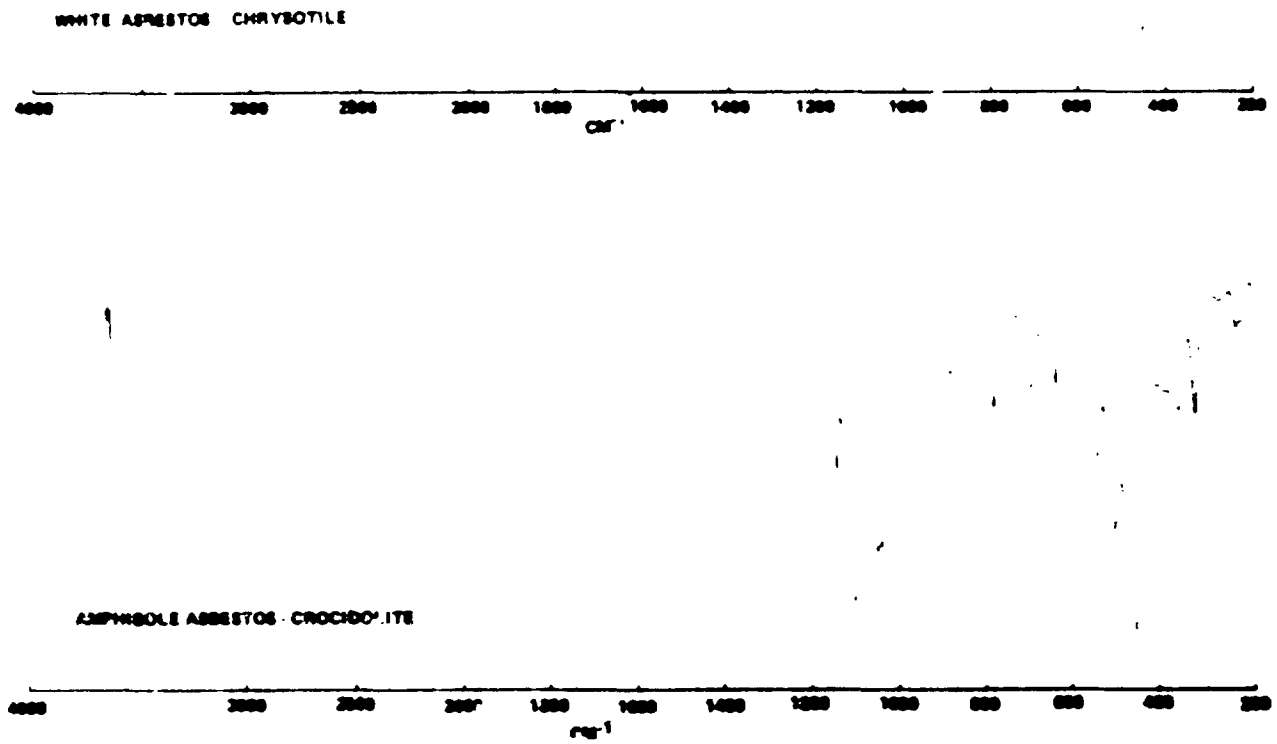
Figure 2

COMPARISON OF CHRYSOTILE AND AMPHIBOLE ASBESTOS



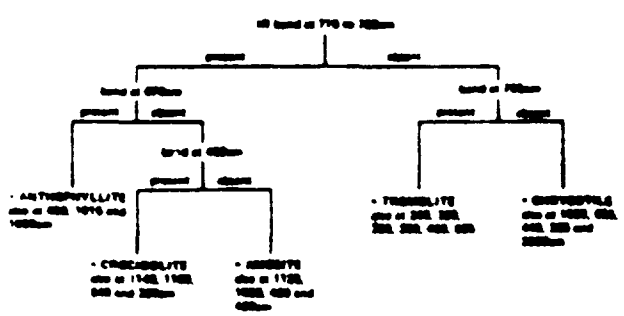


Figure 3

around 3700-3200 cm^{-1} and to a lesser extent 1700-1400 cm^{-1}. These are associated with hydroxyl groups and/or water molecules (physically or chemically bound). Most published infrared studies have been associated with this higher frequency region of the spectrum. Two types of bands are usually observed: a) broad absorptions centered at 3400 cm^{-1} (and 1620 cm^{-1}) and b) fine-structured absorptions above 3500 cm^{-1}. The broad bands are from adsorbed water, and in most cases where spectra are produced from halide disks, these give little information to the analyst because of the potential hygroscopy of the halide disk matrix. The higher frequency fine-structured bands, however, give characteristic data relating to the siting and orientation of the hydroxyl groups. Several detailed studies have been made from these bands and a good review of some of the data is given in Ref. 20. Chrysotile is significantly different from the amphiboles since it exhibits an intense double hydroxyl band at 3693/3648 cm^{-1} pro-

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duced f wn layers of hydroxyl groups sited between the main silicate layers of the lattice. Since this band is substantially more intense in chrysotile, it is used for characterization and quantitative estimation of the fibers in samples collected from the dust, or in liquids that have been subjected to asbestos filtration.[8-10] This band is somewhat sensitive to interference from other mineral silicates such as talc, kaolinite and montmorillonite, which are also used in industrial processes. Therefore careful attention should be given to this possibility by inspection of the complete spectrum, especially in the case of trace analysis. Further evidence of the hydroxyl groups in chrysotile is the broad 605 cm^{-1} band, which is absent in the amphibole spectra.

Sample preparation procedures

The method of sample preparation is strongly dependent on the type of sample submitted to the analyst. In the final form, however, the sample is analyzed either in situ on a fiber matrix or as a compressed halide disk.

Airborne dust samples

If the dust is deposited on a filter material with sufficient infrared transparency in the region required for analysis, direct ir measurement can be used as described in Part I of this article (quartz analysis).[11] (See also Ref. 13). A new technique for the examination of collected fibers on membrane filters with the aid of computer processing is currently under evaluation and this was discussed in Part I of this article.[11]

Isolated fibers

Many samples received for asbestos analysis are either presented as groups of fibers or as fibers in a composite matrix. If single- or grouped-fiber identification is required, the samples are prepared by a carefully controlled procedure based on the formation of a compressed cesium iodide disk. The procedure outlined below was developed after extensive studies with different methods of sample preparation. Cesium iodide is selected for the disk matrix since it appears to give improved spectra when compared with potassium bromide for the same samples prepared under identical conditions. The improvement is observed as a sharpening of the bands in the 1200–200 cm^{-1} region and is probably due to a refractive-index effect.

A wet grinding technique can be used for reducing the size of the asbestos fibers. This approach is not always satisfactory when more than one operator is involved. To enable a standardized procedure to be developed, an electromechanical grinding accessory is preferred. An investigation into optimum grinding conditions for the asbestos fibers and the halide has been carried out. The asbestos fiber is preground for a short time in an attempt to homogenize the sample and unify the particle size. Extended pregrinding can cause loss of resolution in the final spectrum, indicating a breakdown of the crystal structure. Grinding times for the final mixing with the alkali halide are not as critical, but the clarity of the disk is improved if this period is extended to 3–5 min. A summary of the disk-making procedure is given below.

1. Approximately 0.5 mg of sample is weighed into a grinding capsule and preground for 30 sec. The amount of sample is based on the analysis of isolated fibers. In a mixed matrix, larger quantities may be required.
2. 300–400 mg of cesium iodide (spectroscopic grade) are added and the mixture ground for 3–5 min. These times are based on the use of the Perkin-Elmer special 'Schwingmühle' vibration mill.
3. Contents of capsule are transferred to a standard 13-mm Kllr disk die which is then evacuated by a suitable vacuum source (not a water pump) for 5 min. (It is advisable to store the die in a dry box or in an oven at 60°C.)
4. The die is compressed at 10-ton pressure for 10 min with the vacuum maintained.
5. The compressed disk must be removed from the die and used for analysis as soon as possible. Delay at this stage can cause the disk to become opaque. This will usually only interfere with measurements in the 4000–3000 cm^{-1} region. Below 3000 cm^{-1} the disk should still have sufficient transparency for sample identification. If only the 4000–3000 cm^{-1} region is required, potassium bromide may be substituted for cesium iodide since this material is less sensitive to atmospheric water vapor.

Composite or bulk samples

For manufactured 'asbestos' products it is usually advisable to attempt to extract the fibers before carrying out the final analysis. The method of extraction depends on the size and nature of the sample provided. If the fibers are dispersed in a relatively loose medium, they may be removed by either washing with water or dilute acid (e.g., dilute hydrochloric acid). An alternative method is to isolate the asbestos by flotation in a mixed solvent system where the density is adjusted to match the dens-

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FIBRES EXTRACTED FROM ASBESTOS LAGGING AFTER FLOATATION IN WATER

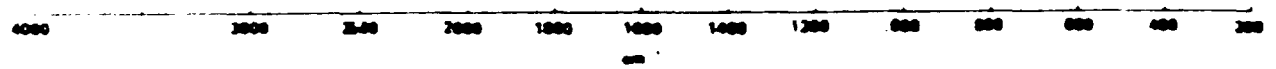

Figure 4

ity of the fibers. An example of data obtained from a sample of pipe lagging after a water-washing treatment is given in *Figure 4*. By comparison with standard spectra it is obvious that this sample is not a single type of asbestos. From data obtained from synthetic mixtures, the major components are chrysotile and crocidolite, with possible interference from another compound (probably a filler material).

With more compacted samples, such as compressed asbestos tiles, asbestos-reinforced concrete and resins, etc., there is the choice of two methods of sampling: 1) removing individual fibers at fracture points in the sample with tweezers or another suitable implement, or 2) powdering the sample in a suitable grinding mill and following the work-up procedure indicated for loose-packed asbestos samples. In the case of reinforced resins it is often possible to remove the resin, if it is not highly cross-linked, with an organic solvent.

The isolation of an individual group of fibers from a composite works well as indicated in *Figure 5*. In this example, a sample of ceiling tile was submitted from a local technical college by the safety officer. The tile had been broken, and at the fracture point there appeared to be some blue asbestos fibers; hence crocidolite was suspected. It is evident from the spectrum (Figure 5), however, that the fibers were not crocidolite but one of the other amphiboles, amosite.

The major problem with removing fibers from a manufactured product is the danger of nonrepresentative sampling. It is therefore essential to obtain several samples from the bulk specimen. Bearing this in mind, any quantitative information can be suspect unless a statistically large number of sampling points are selected.

Quantitative analysis of asbestos

Before contemplating a quantitative exercise on a sample of asbestos it is important to consider the statements made at the end of the last section. The validity of the quantitative information depends on the history of the sample and/or the method of sample collection. Also, the quality and precision of the data is influenced by the presence of interfering materials such as clays, fillers, and other minerals.

The quantitative analysis of a single asbestos, chrysotile, was considered in an earlier section. Similar results can be obtained for other types of as-

SINGLE FIBRE EXTRACTED FROM ASBESTOS TILE

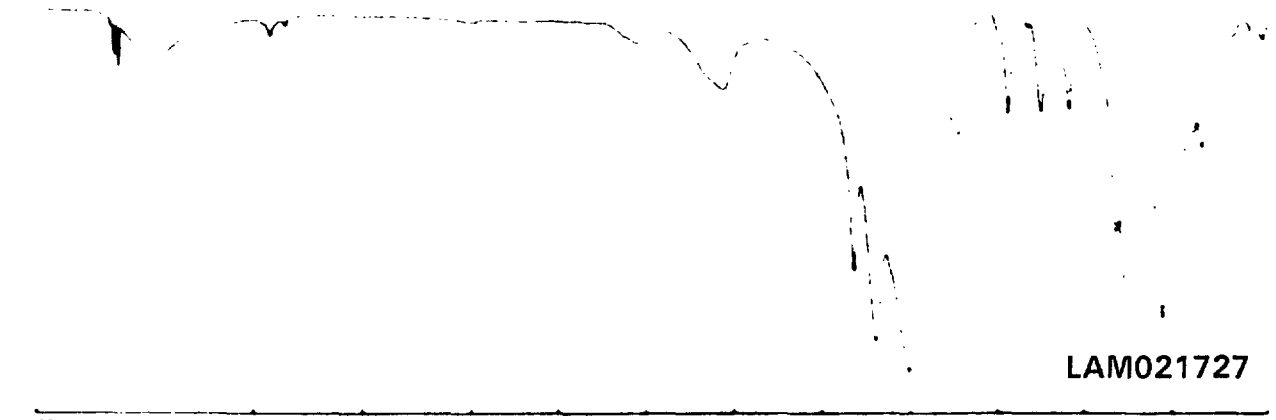

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Figure 5

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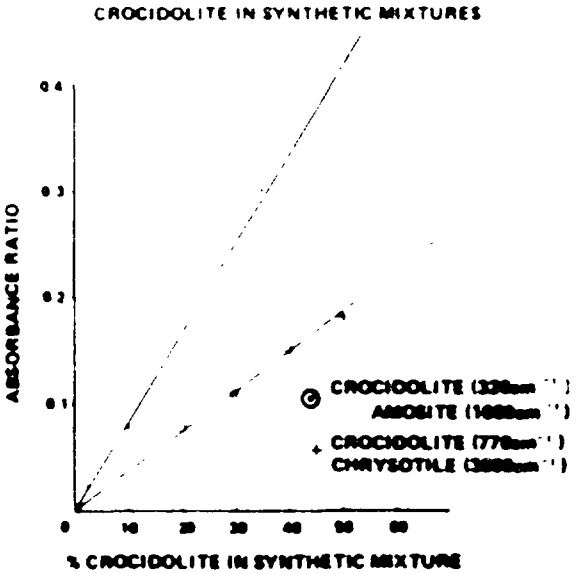

Figure 6

bestos using the bands in the 1200–200 cm^{-1} range if a characteristic absorption can be selected for the compound, relatively free from interference.

Two other types of quantitative analyses are now considered: a) analysis of mixed asbestos forms; and b) analysis of asbestos in other silicate matrices. From the qualitative information described earlier in Figures 1 and 2 it is possible to select characteristic absorptions for individual asbestos types present in a mixture. To investigate the feasibility of quantitative infrared analysis of mixed forms, simple binary mixtures have been examined. Experiments with a series of chrysotile/amphibole (crocidolite) standards covering a concentration range up to 50% crocidolite gave a linear calibration for the absorbance ratio of 778 cm^{-1} crocidolite/3690 cm^{-1} chrysotile bands versus per cent crocidolite in chrysotile. Absorbance ratio was chosen to overcome reproducibility problems associated with the production of halide disks. A similar quantitative relationship was obtained for an amphibole mixture of crocidolite and amosite. For this calibration, the absorbance ratios of the 320 cm^{-1} crocidolite/1080 cm^{-1} amosite bands were calculated. The results of these experiments are shown in *Figure 6*. It is not practical to extrapolate these calibrations to estimate the detection limits. From the results obtained for the mixtures it is possible to detect 3% crocidolite in chrysotile and 20% crocidolite in amosite with a conventional infrared instrument. Further

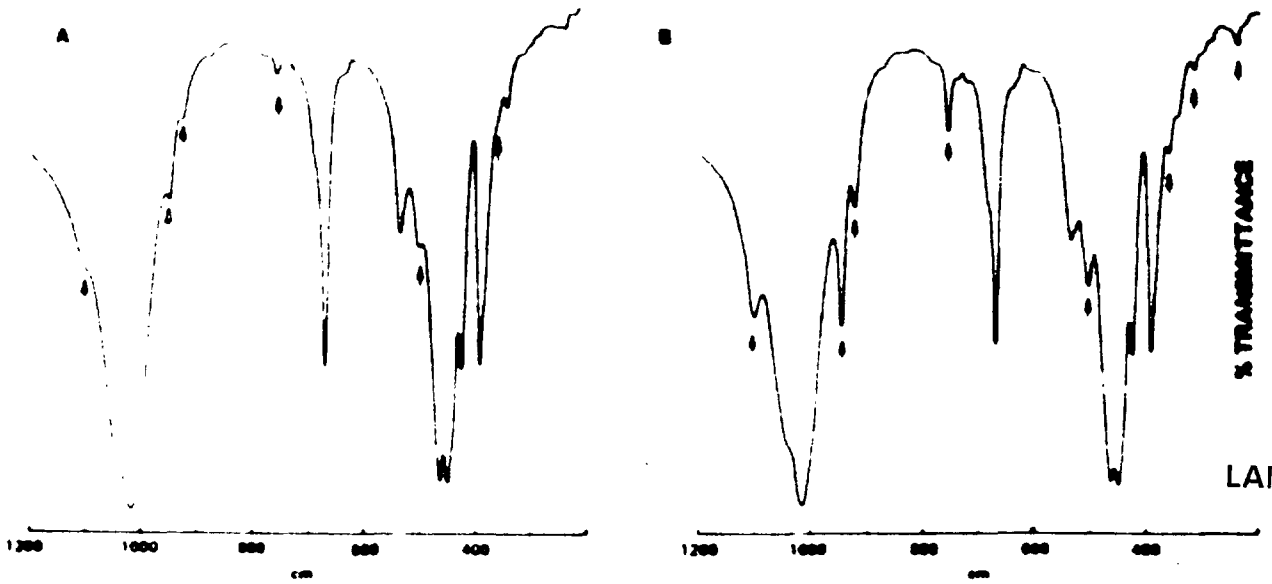

Figure 7

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Of Course...

You Expect a Liquid Scintillation Counter to Count.

But Why Stop There?

Intertechnique Doesn't!



[illegible]

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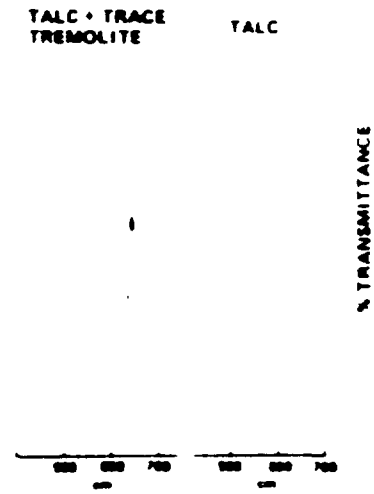

COMPUTER SIMULATED MIXTURES
TREMOLITE IN TALC

LOW CONCENTRATION OF TREMOLITE

Figure 8

improvement, especially with the crocidolite/amosite mixtures, is experienced after computer subtraction of the major component.

Frequently types of asbestos occur as minor components in a nonasbestos silicate matrix. A typical example is the amphibole tremolite (and sometimes anthophyllite), which occasionally occurs in similar rock strata as talc. For this reason, batches of talc are analyzed for the possible presence of the amphibole.

X-ray diffraction has been widely used for this work, although recently infrared analysis has been accepted. Studies with synthetic mixtures indicate that with careful sample preparation, tremolite can be detected at concentrations as low as 0.5% (and possibly lower) within a talc matrix. One method for evaluating both the quantitative aspects and the detection limit of this system is the use of computer simulation of the mixture spectra to eliminate the manual preparation of the individual standard sample mixtures. This may be adopted as a standard approach for producing analytical data from systems containing toxic materials in admixture without the requirement of prolonged physical contact with the basic components. The point is illustrated in *Figure 7* for the analysis of tremolite in talc. In Figure 7, *a* and *b* are simulated spectra of high concentrations of tremolite in talc: i.e., 5% and 20%, respectively. A simulation of a trace amount of tremolite, close to the detection limit, in talc is given in *Figure 8*.

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Discussion

A large amount of analytical data is obtainable from asbestos samples by infrared methods. The

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main problem areas, however, are associated with sample collection (for dust) and representative sampling (for bulk samples) rather than the specified instrumental technique. Infrared analysis could gain general acceptance for asbestos control if careful attention is given to the specification of the experimental conditions.

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By Joseph Sherma, Karin E. Klopping, and Melvin E. Getz

DETERMINATION OF PESTICIDE RESIDUES BY Quantitative thin layer densitometry ON MICROSCOPE SLIDES

THIS PAPER reports the successful use of precoated silica gel microscope slides for the quantitative determination of pesticide residues by thin layer densitometry. The slides were evaluated and compared to conventional 20 × 20 cm layers and then applied to the separation and determination of residues of several pesticides in different matrices.

Experiment

Thin layers

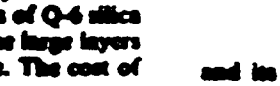
Q-6 glass-backed, precoated microslide silica gel layers, 1 × 3 in. (Quantum Industries) were used throughout most of this study. Q-6 is a polar, fast developing, polymer-bound or "hard" layer silica gel of 250 μm layer thickness and 40 Å pore size.

For comparisons, 20 × 20 cm layers of Q-6 silica gel were used. Neither the slides nor the large layers were pretreated in any way before use. The cost of one precoated Q-6 microslide layer is considerably less than one 20 × 20 cm layer.

Analtech Uniplates (#1521; supplied 1 × 4 in., cut to 1 × 3 in.) coated with silica gel G were used only for the DDT determination because they provided optimal visualization with $AgNO_3$ reagent.

A dye mixture (Mallinckrodt) containing 1 mg/ml each of butter yellow, Sudan Red, and Indophenol Blue in benzene was diluted with benzene or hexane to prepare standards for preliminary testing. See *Table 1* for calibration data.

Standards of *o,p'*-DDT [1,1,1-trichloro-2-(*o*-chlorophenyl)-2-(*p*-chlorophenyl)ethane] and carbaryl (1-naphthyl *N*-methylcarbamate) were obtained from the EPA Pesticide Repository. Phorate,



$$[(C_2H_5O)_2\overset{\overset{\displaystyle S}{\|}}{P}SCH_2SC_2H_5]$$

and its metabolites (*Table 2*) were obtained from American Cyanamid Co.

Standard solutions of phorate and its metabolites and carbaryl were prepared in pesticide grade ethyl acetate and DDT in hexane. For spotting with mi-

Dr. Sherma is Professor of Chemistry, Lafayette College, Ms. Klopping is a Graduate Student, Purdue University, and Mr. Getz is Chemist, United States Department of Agriculture.

Table 1

Calibration curve data for Sudan Red dye on microslides and 20 × 20 cm thin layers

Sample weight, g	Peak weight × attenuation microslides[a]				Peak weight × attenuation, 20 × 20 cm[b]			
	1	2	3	Range	1	2	3	Range
0.00	0	0	0	—	0	0	0	—
6.25×10^{-6}	0.505	0.516	0.503	0.030	0.082	0.030	0.082	0.040
1.25×10^{-7}	0.985	1.12	1.04	0.12	1.04	1.24	1.27	0.23
2.50×10^{-7}	1.53	1.83	1.61	0.10	2.14	2.13	2.48	0.33
5.00×10^{-7}	2.13	2.20	2.28	0.15	3.16	3.42	3.68	0.50
7.50×10^{-7}	2.44	2.42	2.62	0.20	4.08	3.17	3.99	0.37
1.00×10^{-6}	3.22	3.38	3.12	0.24	4.34	4.94	5.50	1.16

[a]For all points $Y = 2.90 \times 10^6 X + 0.476$, $R = 0.962$
[b]For all points $Y = 4.70 \times 10^6 X + 0.531$, $R = 0.967$

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MONDAY, JUNE 19, 1978
PART III



Federal

ENVIRONMENTAL PROTECTION AGENCY

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

Asbestos Standard; Amendments

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[6560-01]

Title 40—Protection of the Environment

CHAPTER I—ENVIRONMENTAL PROTECTION AGENCY

[FRL 369-7]

PART 61—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

Amendments to Asbestos Standard

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This rule amends the national emission standard for asbestos by extending the requirements of the provisions which apply to the spraying of asbestos-containing materials and to demolition and renovation operations. These amendments are a result of a determination that the standard did not require control of asbestos emissions during spray application of asbestos-containing materials other than fireproofing and insulation or during the demolition and renovation of structures where friable asbestos materials other than fireproofing and insulation are present.

EFFECTIVE DATE: June 19, 1978.

ADDRESS: A summary of the public comments on the proposed amendments and EPA's responses is contained in the Standards Support Document which may be obtained upon written request from the EPA Library (MD-35), Research Triangle Park, N.C. 27711 (specify *Standards Support Document: Promulgated Amendments to National Emission Standard for Asbestos*, EPA 450/2-77-030, January, 1978). The Standards Support Document is also available for public inspection and copying at the EPA Public Information Reference Unit, Room 2922 (EPA Library), 401 M Street SW., Washington, D.C. 20460.

FOR FURTHER INFORMATION CONTACT:

Don R. Goodwin, Director, Emission Standards and Engineering Division (MD-13), Environmental Protection Agency, Research Triangle Park, N.C. 27711, telephone number 919-541-5271.

SUPPLEMENTARY INFORMATION: On March 2, 1977 (42 FR 12121), amendments to the national emission standard for asbestos were proposed under section 112 of the Clean Air Act. Interested persons participated in the rulemaking by submitting comments to EPA. The comments have been considered and, where determined by the Administrator to be appropriate, changes reflecting these comments have been [illegible] into the promulgated [illegible].

Under [illegible] of the Clean Air Act, [illegible] in 19[illegible], the Administrator [illegible] promulgate a [illegible], equipment, work practice, or operational standard, or combination thereof" for control of a hazardous air pollutant if it is infeasible to prescribe an emission standard under section 112(b) for the pollutant. Such infeasibility occurs, for example, when "a hazardous pollutant or pollutants cannot be emitted through a conveyance designed and constructed to emit or capture such a pollutant" or when "the application of measurement methodology to a particular class of sources is not practicable due to technological or economic limitations." The spraying of friable asbestos materials and demolition or renovation of buildings containing such materials are sources of asbestos emissions for which EPA believes it is not feasible to prescribe a numerical emission standard. This is because asbestos cannot be emitted through a conveyance which readily captures emissions for measurement and because such measurement, in any event, would be technologically and economically impractical. Therefore, work practice standards rather than emission standards are being promulgated.

This promulgation is not affected by the Supreme Court decision in *Adams Wrecking Co. v. U.S.* (No. 76-911, decided January 10, 1978). That case arose in the narrow context of a criminal enforcement proceeding and was decided on an interpretation of section 112 prior to its amendment in 1977. The court held that the pre-1977 version of section 112 did not authorize a portion of the national emission standard for asbestos (prescribing certain work practices for demolition and renovation activities) because it consisted of requirements other than numerical limitations on emissions. The 1977 amendments to section 112 now clearly authorize the Administrator to promulgate work practice or other nonnumerical standards in order to control emissions of hazardous air pollutants. Another important 1977 amendment to the Clean Air Act explicitly authorizes citizens and States, under section 304, to enforce work practice and other nonnumerical standards promulgated under section 112.

Summary of Amendments

The national emission standard for asbestos currently regulates demolition and renovation operations involving asbestos-containing insulation and fireproofing materials and prohibits the spray application of these materials if they contain more than 1 percent asbestos. The promulgated amendments extend coverage of the demolition and renovation provisions [illegible] (42 FR 61.22(d)) [illegible] (42 FR 61.22(e)) [illegible] materials which contain more than 1 percent asbestos. Materials in which the asbestos fibers are encapsulated with a bituminous or resinous binder and which are not friable after drying are exempt from the spraying provisions.

Summary of Environmental and Economic Impacts

The promulgated amendments to the asbestos standard will have a significant beneficial environmental impact by reducing emissions of asbestos to the atmosphere. There will be minimal solid waste and water pollution impacts from the increased amount of friable asbestos materials which must be removed and disposed of in conjunction with demolition or renovation. No impact on national energy consumption is anticipated.

The amendments to the demolition and renovation provisions may increase the cost of demolition or renovation because of the increased amount of friable asbestos-containing materials which will be covered by these regulations. Comments from representatives of the demolition industry, however, did not address this point. Therefore, this impact is not expected to be significant.

Spray-on asbestos-containing decorative coatings are the primary products prohibited by the amendments to the spraying restrictions. Since substitutes are available for these products, no significant adverse economic impacts are expected to result from prohibiting their use.

Significant Comments

During the public comment period, EPA received 24 letters commenting on the proposed amendments. These included 16 from industry, 3 from other governmental agencies, and 5 from other interested parties. As a result of these comments, there has been only one significant change made to the amendments since proposal. This change involves the spraying restriction in §61.22(e). The proposed amendments would have prohibited the spraying of all materials containing more than 1 percent asbestos by weight.

Several commenters, however, requested that EPA exempt from the spraying restrictions certain bituminous- and resinous-based asbestos-containing coatings. These coatings are typically used as roofing compounds, waterproofing of insulation exposed to the weather, automobile undercoatings, and industrial maintenance coatings.

Based on information supplied by the commenters, there are no acceptable substitutes available for these

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[illegible] and other [illegible] fibers [illegible] have been found to be unacceptable because of [illegible] durability, [illegible] and [illegible] the [illegible] to [illegible] movement [illegible] operation, [illegible] and settlement in the [illegible] time. Furthermore, [illegible] fibers are released during application of the coatings, during their service life, or during demolition or renovation, the fibers will not remain airborne because they are encapsulated by droplets of the binder and are too heavy to remain suspended.

Because there do not appear to be acceptable substitutes available and any beneficial environmental impact resulting from the prohibition of this use of asbestos would be negligible, the spraying of materials in which the asbestos fibers are encapsulated by a bituminous or resinous binder and which are not friable after drying is exempt from the provisions of § 61.22(e) of the promulgated amendments.

There were several other significant comments which did not result in changes to the amendments. To aid enforcement of the proposed spraying restrictions in § 61.22(e), commenters suggested that products should be labeled as to their asbestos content if they contain in excess of 1 percent asbestos by dry weight and have the potential for spray-on application. Requiring labeling would constitute a significant change in the amendments and would require reproposal. Rather than reproposing, the need for this provision will be assessed during enforcement of the amendments and, if appropriate, labeling requirements will be proposed.

One commenter suggested that the regulation be extended to require removal of existing asbestos-containing sprayed materials which present significant risks to human health due to deterioration, particularly in buildings accessible to the public. The proposed amendments would have only prohibited the future application of asbestos-containing spray material.

This problem is being addressed through the preparation of a guidance document which will assist governmental [illegible] and individuals who [illegible] in taking action to [illegible] materials are [illegible] buildings. The [illegible] of this document [illegible] the use of sealants for the control of [illegible] fibers. The second volume of [illegible] which is expected to be available in late 1978, will present the results of studies which will be done on sealants to determine their effectiveness and acceptability for [illegible] asbestos materials. Copies of the first volume of this document may be obtained upon written request from the Emission Standards and Engineering Division (MD 13), Environmental Protection Agency, Research Triangle Park, N.C. 27711 (specify *Sprayed Asbestos-Containing Materials in Buildings: A Guidance Document*)

The lack of EPA reference methods for making various asbestos measurements was of concern to some commenters. Specifically, they suggested that EPA publish a method for determining the percentage of asbestos in spray materials and reference OSHA-NIOSH procedures for measuring airborne asbestos particulate matter from spraying operations.

A number of methods for the analysis of asbestos-containing samples are now in use and the variability of results obtained by these methods is extremely wide. In an attempt to standardize procedures and reduce this variability, an EPA provisional electron microscope procedure for measuring the concentration of asbestos in air samples has been developed. This method can also be used for analysis of material samples. It will be further evaluated and refined for use in actual field studies and if found acceptable, may eventually serve as the basis for an EPA reference method. The procedure is available in a publication entitled Electron Microscope Measurement of Airborne Asbestos Concentrations: A Provisional Methodology Manual, EPA 600/2-77-178, August 1977. Copies of this document may be obtained upon written request from the Environmental Sciences Research Laboratory (MD-49), EPA, Research Triangle Park, N.C. 27711.

The OSHA NIOSH method measures airborne asbestos fiber concentrations by phase contrast microscopy. It measures only those fibers which are longer than 5 microns and does not differentiate between asbestos and other fibers. While such a method may be sufficient for enforcing the OSHA workplace asbestos standard, it is not sufficient as an indicator of total asbestos concentration in the [illegible] Many asbestos fibers are smaller than the [illegible] by the OSHA NIOSH method and these fibers can contribute significantly to [illegible] with [illegible]

[illegible] suggested that [illegible] a carcinogen and no [illegible] for [illegible] has been established the 1 percent allowable asbestos content for spray-on materials [illegible] too much environmental [illegible] and should be lowered [illegible] if not completely eliminated. The 1 percent allowable asbestos content was selected primarily to allow the spray application of materials which contain trace amounts of asbestos which occur in numerous natural substances and which could not be reduced or eliminated without effectively banning the use of these materials.

Miscellaneous

Note.—The Environmental Protection Agency has determined that this document does not contain a major action requiring preparation of an Economic Impact Analysis under Executive Orders 11821 and 11949 and OMB Circular A 107.

Dated: June 13, 1978.

Barbara Blum,
Acting Administrator.

In Part 61 of Chapter I, Title 40, of the Code of Federal Regulations, §§ 61.21 and 61.22 are amended as follows:

Subpart B—National Emission Standard for Asbestos

1. Section 61.21 is amended by revising paragraphs (m), (q), and (r) to read as follows:

§ 61.21 Definitions.

• • • • •

(m) "Renovation" means the removing or stripping of friable asbestos materials used on any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member. Operations in which load supporting structural members are wrecked or taken out are excluded.

• • • • •

(q) "Removing" means taking out friable asbestos materials used on any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member from any building, structure, facility, or installation.

(r) "Stripping" means taking off friable asbestos materials from any pipe, duct, boiler, tank, reactor, turbine, furnace, or structural member.

• • • • •

2. Section 61.22 is amended by revising [illegible] (d)(1) [illegible]

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