S74-306

MVMA MEETING NOTICE

MOTOR VEHICLE MANUFACTURERS ASSOCIATION

FORD CHAIRMAN OF THE BOARD
FRANKLIN M. FREEMAN, PRESIDENT
RUSSELL E. MARCLEY, SECRETARY

PLAINTIFF'S EXHIBIT
FD-1471

November 1, 1974

TO:

W. Krebs, Ph.D. (Chairman)	General Motors Corporation
H. Lick	Ford Motor Company
L. Gendernauk, Ph.D.	Chrysler Corporation
T. Massaro	American Motors Corporation
	International Harvester

FROM: R. A. Stolberg

SUBJECT: Ad Hoc Group on Asbestos Meeting November 14, 1974

The Chairman of this new Ad Hoc Group has requested a meeting be scheduled for:

Thursday, November 14, 1974
9:00 a.m. - Room 729
MVMA Detroit Offices

The preliminary agenda will be to review the present OSHA Standard 1910.93a Asbestos (39 FR 23543 - June 27, 1974). OSHA has indicated their intention to offer amendments to this standard to be promulgated before the end of this year.

The following materials are attached for background information on this matter:

- MVMA Action Bulletin S74-590
- ASTM E-34 Mineralogical Definitions and Ballot
- ASTM E-34 Draft Recommendations for an Asbestos Standard
- AIA/NA Letter and recommendations to OSHA for revision of asbestos standard
- ANSI Draft standard (5/2/74) "Fundamentals Governing the Design and Operation of Local Exhaust Systems for the Control of Asbestos - Containing Dusts".

Please review these materials before the meeting and bring them with you for discussion purposes.

# # #

RAS/bt

Attachments (5)

8005 1249 PQ

PRODUCED BY FORD

SCF-ALLF-05160

MVMA ACTION BULLETIN

MOTOR VEHICLE MANUFACTURERS ASSOCIATION OF THE UNITED STATES, INC. • 320 NEW CENTER BUILDING • DETROIT, MICHIGAN 48202 • 872-4311 AREA 313

ROY D. CHAPIN, JR., *Chairman*
FRANKLIN M. KREML, *President and Chief Executive Officer*
RUSSELL E. MacCLEERY, *Vice President*

October 16, 1974

TO: Occupational Safety and Health Committee (OSHC)

FROM: R. A. Stolberg

SUBJECT: OSHA revisions of the Asbestos Standard, 29 CFR 1910.93a

Mr. Harry Gilbert, Project Officer, Office of Standards, OSHA, indicated at a Washington, D. C. meeting with the Asbestos Information Asssociation (AIA) that amendments to the standard will be proposed on or about November 1 and a new standard probably would become effective in June, 1975. See Attachment I for a report of this meeting.

Recently I received an inquiry from Mr. Robert H. Mereness, executive director of AIA, regarding whether or not MVMA had submitted comments regarding new amendments. He indicated that OSHA had contacted their association for recommendations and these were submitted July 15. I requested a copy of the AIA recommendations to OSHA and he agreed to provide this material. Mr. Mereness felt that a proposed standard would be promulgated before the end of this year by OSHA. See Attachment II for background concerning the AIA Committee membership and recommendations.

Mr. Mereness represents a friction materials manufacturer and questioned if some of MVMA's member companies did not also have similar operations. He was concerned about the Union's recommendations for a zero asbestos fiber limit and the findings of a study reported by Dr. Selikoff's colleagues, "Asbestos Exposure During Brake Lining Maintenance and Repair" - Arthur N. Rohl, PhD. et al presented as paper number 223 at the 1974 AIHA conference.

we find true

I asked Mr. Mereness if OSHA was familiar with the activity of ASTM Committee E-34, Task Group on Naturally Occurring Inorganic fibers (Action S74-564). Although he was aware of this committee, he indicated their progress was primarily in the area of defining asbestos and didn't consider their input to OSHA significant.

8005 1250

PRODUCED BY FORD

Action Requested

Please review the attached information as this subject will appear as an agenda item for discussion at the next OSHC meeting scheduled October 25, 1974.

# # #

RAS/bt

Attachments (2)

PRODUCED BY FORD

including the date, time, location, results obtained person making tests, and calibration date of equipment shall be maintained at the job site. If concentrations reach 25 parts of carbon monoxide per million parts of air (0.0025 percent), tests should be made more frequently. Concentrations should not exceed 35 parts per million (0.0035 percent) at any time at employee breathing zones. When concentrations do exceed this level, employees shall leave the area and additional natural or mechanical ventilation shall be provided.

No persons shall be permitted to be within the area being heated by the salamanders except when tending them, when testing the atmosphere, or in emergencies.

Throughout the discussion of the proposed standards Robert M. Farell, safety director, International Union of Operating Engineers, Countryside, Ill., said that this standard should not be promulgated because salamanders are only permissible under interim orders in three states and the District of Columbia and that only a few are still being manufactured. "We are virtually making a standard for a piece of equipment that basically does not exist,," he said. Farrell alluded to the difficulty in getting covers for salamanders due to the fact that most salamanders now in use are fabricated by the construction companies using them and the present materials shortages could deter compliance. "It's an unenforceable code," he said.

Asbestos

OSHA WILL PROPOSE AMENDMENTS TO RULES FOR ASBESTOS IN NOVEMBER, AIA IS TOLD

Amendments to the standard for occupational exposure to asbestos, 29 CFR 1910.93a will be proposed on or about November 1, according to Harry Gilbert, project officer, Office of Standards, Occupational Safety and Health Administration.

Addressing the Asbestos Information Association in Washington, D.C., on September 11-12, Gilbert said the new standard probably will become effective in June, 1975.

Citing recommendations made by the AIA (Current Report, August 22, p. 327), he noted not all may be adopted by OSHA, but all will be given careful consideration. Deleted from the present standard will be those requirements that "are an onerous burden on employers with no benefit to health and safety, in an effort to aid in voluntary compliance since there are limitations on the number of industrial hygienists and compliance officers available to make inspections," he said.

Dr Daniel Boyd, director, OSHA Office of Standards, said more efficient standards-making processes are needed to avoid duplication of efforts. If a standard is developed by a consensus organization it undergoes an extensive process, and I've got to take it through Orb)," he said, adding the American National Standards Institute has been named as an intergrating agency for all organizations dealing with standards development. Boyd said ANSI has been "very responsive," to the needs of OSHA. He referred also to a new task force in the Standards Office, headed by Dr. Don Lassiter (see related story this issue) which will set priorities for standards development. Boyd said once these priorities are established, the standards setting mechanism will be engaged in the most efficient way possible.

ANSI will have a full-time Washington, D.C., director of safety and health who will deal closely with OSHA. ANSI will not write the standards, but will coordinate with the National Fire Protecton Association (NFPA), the American Conference of Governmental Industrial Hygienists (ACGIH), and the American Society for Testing and Materials (ASTM), and other consensus groups, where input is needed. Boyd noted also the need for better coordination with other Government agencies.

Reorganization

Assitant Labor Secretary John H. Stender said OSHA recently completed a major reorganization of the Office of Standards Development, increasing the staff, and realigning it along task force lines. "This will permit us to anticipate problems like asbestos, pesticides, and vinyl chloride before they are upon us," he said. Stender noted also the joint OSHA-National Institute for Occupational Safety and Health standards completion project that will produce complete health standards for over 400 toxic substances.

Union Charges

Sheldon W. Samuels, Industrial Union Department, AFL-CIO, discussed corporate integrity, noting people hired by industry "are incapable of objectivity and candor." He called the decision on the part of major industry not to hire a medical director, or to hire "one who would tell you what you want to hear, is mindless, and stupid." This increases the intensity of the disruption in the workforce, he added.

Referring to the United States Chamber of Commerce, the National Association of Manufacturers, Organization Resources Counselors, and other similar groups, he said activities of these organizations in the area of safety and health "border on white collar crime."

Threshold limit values have, in many cases, "been purchased," and "should be proven," he said.

ORC View

Leo Teplow, Organization Resources Counselors, Inc., Washington, D.C., said business has been so extraordinarily successful in some respects. It should be known that safety and health is a major preoccupation of management.

Teplow referred to the similarity of goals between management and organized labor and noted that "confrontation" should be avoided and replaced by "food for thought." He said the asbestos standard, since it was the first developed by OSHA, had no patterns to follow. It was important because the issues raised went far beyond one industry and one substance.

He commended AIA, noting industry can help bring essential facts to bear on OSHA decisions and "AIA has done this."

Johns-Manville

Dr Paul Kotin, vice president, health, safety, and environment, Johns-Manville, said "safe exposure levels exist, if exposure at certain levels does not increase risk of disease."

Industry accepts the responsibility for workers exposed to asbestos, including those in the "incubation period," he said. Threshold limit values are maximum allowable concentrations, expressions of a series of judgments not end points, he said. Industry cannot be satisfied with acceptance of TLV's if it can be shown that hazards exist, he added. Industry must try to distinguish between fact and opinion in an effort not to replicate absence of fact over the next decade. Asbestos can be safely mined, milled, fabricated, and used, he said, noting that the AIA will be successful only to the extent it is aggressive.

Kotin said the asbestos industry should not hire workers who smoke any more than a "person with polio would be hired to paint the Golden Gate Bridge," noting the problems inherent in hiring "high risk" persons.

8005 1252 PQ

PRODUCED BY FORD

Asbestos regulations

Noel Hendry, Johns-Manville, said OSHA regulations effect the asbestos industry in the areas of sprayed asbestos, plastics and insulation products among other areas. He noted Johns-Manville is the largest U.S. producer of asbestos fiber. He said also that the status of the asbestos industry is very, very good."

Industry Overview

Richard B. Berman, director, labor relations, U.S. Chamber of Commerce, said Congress unfortunately relies on the labor committees "who are at the beck and call of the AFL-CIO."

Asbestos

NON-ASBESTIFORM TREMOLITE IS NOT WITHIN SCOPE OF OSHA ASBESTOS RULE

Nonfibrous or non-asbestiform minerals such as non-asbestiform tremolite are not within the scope of the existing standard for asbestos, according to an interpretation of the standard issued by Assistant Labor Secretary John H. Stender on August 6.

The Occupational Safety and Health Administration asbestos standard appears in 29 Code of Federal Regulations, Part 1910.93a(Reference File 31:5304).

The present asbestos standard is written for the purpose of controlling exposures to the fibrous or asbestiform minerals commonly considered to be asbestos, Stender said.

This is reflected in the established permissible limit for asbestos air contamination to which a worker may be exposed. This is expressed in terms of numbers of fibers in excess of determination or analysis is also expressed as a method for counting fibers.

Talc containing only non-asbestiform tremolite is not regulated by the asbestos standard either, Stender said. If only talc and non-fibrous tremolite are present, there is no violation of the asbestos standard. Talc containing asbestiform tremolite or other fibrous asbestos minerals will be regulated by the asbestos standard, he added.

This interpretation of the standard reflects the collective opinion of both OSHA and the National Institute for Occupational Safety and Health, Stender said.

Agriculture

AGRICULTURE STANDARDS ADVISORY COMMITTEE WILL MEET IN WASHINGTON

The Standards Advisory Committee on Agriculture including the subcommittees on field sanitation, hand and portable tools, walking and working surfaces, and ladders, will meet in Washington, D.C. on September 24-25.

The meeting will begin at 9 a.m. each day in room 107 ABC, Main Labor Building, Constitution Ave., at 14th St. NW. The meeting is open to the public.

The agenda provides for the full committee to meet in an introductory session each day after which the subcommittees will meet in separate sessions. The subcommittees will continue deliberations from previous meetings.

The subcommittee on ladders is meeting for the first time and will begin deliberations toward recommending a standard as soon as the walking and working surfaces subcommittee completes a brief meeting on the first day. The full committee will reconvene to receive and consider any other business pending before the committee.

Any written data or views concerning the subjects to be considered which are received by the committee management office before the date of the meeting, together with 20 duplicate copies, will be given to the members and included in the record of the meeting.

Persons wishing to orally address the committee at the meeting should submit a written request to be heard, including the subject on which they will speak, as well as an estimate of the amount of time requested and the capacity in which they will appear.

Such information should be addressed to Jeanne W. Ferrone, committee management officer, 1726 M St., NW, Room 200, Occupational Safety and Health Administration, Washington, D.C. 20210, tel. 202 961-2248, 2487.

Kentucky

FEDERAL REPORT RECOMMENDS CONTINUED PLAN APPROVAL, NO FEDERAL FORCE CHANGE

The federal evaluation report of Kentucky's first six months of operations under an approved job safety and health plan recommended continued plan approval, but no reduction of federal forces in the state for the second six-month period of operations.

The state accomplished developmental steps during the first six months of operations as set out in the state plan approval notice (Reference File 81:6003). "There does not appear to be any problems or deficiencies with the plan which would cause an unfavorable determination at this time" under Section 18(e) of the Occupational Safety and Health Act, the report noted.

The report lists a summary of findings noted during August 1, 1973, through January 31, 1974. It focuses on the enforcement activities of the state based on review and evaluation of 265 case files of the state department of labor and on 32 case files of the state public service commission.

In addition, observations and subsequent recommendations for the department of labor and the public service commission resulted from general discussions with the state, review of the plan, and an on-site visit conducted from March 25 to March 29, 1974.

Department Deficiencies

Deficiencies in the department of labor were noted for lapse of time between date of inspection and date of citation issuance, average proposed penalties for nonserious violations, distribution of inspections, and use of electrical standards.

Minor problems also were noted regarding employee involvement in inspections, insufficient documentation of case files, and inaccurate gravity classifications.

The report also noted failings by the public service commission to meet federal criteria in the areas of inspection geographic spread, employee involvement in inspections, citing of violations with appropriate standards, and the number of inspections carried out per month per man. The commission has responsibility for administration of the state plan for utilities under its jurisdiction.

Problems in the state department of occupational health centered around the scheduling of health hazard inspections, laboratory support, provisions for radiation hazard protection, and hazard abatement dates, the report noted.

The report also observed problems and addressed recommendations to the state's compliance officer training program, use of job safety and health resources, the management information system, and processing of standards interpretations and clarifications.

Copyright © 1974 by The Bureau of National Affairs, Inc.

8005 1253 PQ

PRODUCED BY FORD

ATTACHMENT II

ASBESTOS INDUSTRY URGES EXPOSURE CEILING OF 10 FIBERS OVER 10-MINUTE PERIOD:

The Asbestos Information Association/North America has suggested revision of the asbestos standard to include a limit of 10 fibers, longer than 5 micrometers per cubic centimeter of air as determined over a 10-minute period, as well as work practices for the asbestos industry.

In a letter to Daniel P. Boyd, Director of OSHA's Office of Standards Development, dated July 15, Robert H. Mereness, executive director of the Association, wrote:

"We can report that there is an industry-wide appreciation of the health problems associated with asbestos dust in the workplace, requiring realistic understanding and remedial action where necessary."

The recommendations were prepared by the Association's Standards and Technical Committee composed of environmental control engineers, industrial hygienists and safety and health directors, to assist OSHA in its review and possible revision of the standard by early next year.

On the question of ceiling concentration, the Association's recommendation is as follows:

"No employee shall be exposed to airborne concentrations of asbestos fibers in excess of 10 fibers, longer than 5 micrometers, per cubic centimeter of air, as determined over a 10-minute period by the method prescribed. . ." Its recommendation would delete the requirement of exposure "at any time" and insert "over a 10-minute period."

The Association said that its reasoning was that limitations of the monitoring procedure make it impossible to determine instantaneous peak exposures. A 10-minute sampling period is a practical minimum, it said.

In addition, it recommended that monitoring not be required in those situations where significant quantities of airborne asbestos fiber are not released. That, in the view of the Association, would include usage of products where asbestos fibers "have been modified by a bonding agent, coating, binder or other material so that during any reasonable foreseeable use, handling, storage, disposal, processing or transportation, no airborne concentrations of asbestos fiber in excess of the exposure limits prescribed in paragraph (b) of this section will be released."

Work practices offered by the Association for OSHA's review include: unloading and storing bagged asbestos fiber; introduction of asbestos fiber into manufacturing processes; asbestos dust and scrap removal and disposal; and housekeeping in the asbestos industry.

The committee is headed by Edmund M. Fenner, Director of Environmental Control for Johns-Manville. Other members: Harold L. Becker, Chief Engineer, Nicolet Industries, Ambler, Pa.; Charles C. Clarke, Industrial Hygienist, Bendix Corp., Southfield, Mich.; C. Nelson Codding, Corporate Environmental Control, Jim Walter Research Corp., St. Petersburg, Fla.; William Fassuliotis, Director of Safety and Security, GAF Corp., New York, N.Y.; John P. McGauley, Director of Manufacturing, Asbestos Cement Pipe & Plastics, Certain-teed Products Corp., Ambler, Pa.; L.F. Moody, Plant Engineer, Southern Asbestos Co., Charlotte, N.C.; Fraser Morton, Industrial Engineer, Compudeum Industries, Inc., Finksburg, Md.; William H. Mortonson, General Manufacturing Manager, Flintkote Co., E. Rutherford, N.J.; Dr. H.B. Rhodes, Area Manager, Marketing and Technology, Union Carbide, Niagara Falls, N.Y.; Isaac H. Weaver, Director of Environmental Control, Raybestos-Manhattan, Inc., Trumbull, Conn.; Frank H. Zimmerman, Corporate Director, Safety and Environmental Health, National Gypsum Co., Buffalo, N.Y.

8005 1254 PQ

PRODUCED BY FORD

AMERICAN SOCIETY FOR TESTING AND MATERIALS

Task Group Letter Ballot: Issue date 11 Oct 1974
Deadline for receipt 11 Nov 1974

Task Group on Naturally Occuring Inorganic Fibers
of ASTM Committee E-34

Information and Instructions

1. Return of this ballot is required from members even if not prepared, of qualified, to vote affirmatively or negatively on any item. In such cases the 'ABSTAINING' column should be checked.

2. When voting 'AFFIRMATIVE' or 'NEGATIVE' a member must indicate his classification as a Producer (P), User (U), or General Interest (GI), with respect to each item, and not necessarily with respect to his classification on the committee.

3. Negative votes and any comments must be accompanied by an explanation (on a separate sheet) in order to be considered. Include proposed specific changes when applicable.

PRINT NAME_____
COMPANY_____
DATE_____
SIGNATURE_____

RETURN one copy of ballot to:

M. Cossette
Recording Secretary
QAMA Laboratory
University of Sherbrooke
Sherbrooke, P.Q., Canada J1K 2R1

DEFINITION	AFFIRMATIVE P	AFFIRMATIVE U	AFFIRMATIVE GI	NEGATIVE P	NEGATIVE U	NEGATIVE GI	ABSTAINING
asbestiform							
asbestos							
fiber							
fibril							
fibrous particulate							
naturally-occuring mineral fiber							

Keep white one for your records.

8005 1255

PRODUCED BY FORD

AMERICAN SOCIETY FOR TESTING AND MATERIALS

Task Group Letter Ballot: Issue date 11 Oct 1974
Deadline for receipt 11 Nov 1974

Task Group on Naturally Occuring Inorganic Fibers
of ASTM Committee E-34

Information and Instructions

1. Return of this ballot is required from members even if not prepared, of qualified, to vote affirmatively or negatively on any item. In such cases the 'ABSTAINING' column should be checked.

2. When voting 'AFFIRMATIVE' or 'NEGATIVE' a member must indicate his classification as a Producer (P), User (U), or General Interest (GI), with respect to each item, and not necessarily with respect to his classification on the committee.

3. Negative votes and any comments must be accompanied by an explanation (on a separate sheet) in order to be considered. Include proposed specific changes when applicable.

PRINT NAME_____
COMPANY_____
DATE_____
SIGNATURE_____

RETURN one copy of ballot to:
M. Cossette
Recording Secretary
QAMA Laboratory
University of Sherbrooke
Sherbrooke, P.Q., Canada J1K 2R1

DEFINITION	AFFIRMATIVE P	AFFIRMATIVE U	AFFIRMATIVE GI	NEGATIVE P	NEGATIVE U	NEGATIVE GI	ABSTAINING
asbestiform							
asbestos							
fiber							
fibril							
fibrous particulate							
naturally-occuring mineral fiber							

Keep white one for your records.

8005 1256

PRODUCED BY FORD

Document No. 26

11 October 1974

Mineralogical Definitions of Terms Relating to Naturally Occuring Inorganic Fibers

asbestiform - mineral structured in the form of asbestos

asbestos - generic term for naturally-occuring inorganic hydrated silicates that, when processed separate into fibrils. Minerals defined as asbestos are the asbestiform varieties of the following; serpentine (chrysotile), riebeckite (crocidolite), cummingtonite (amosite), anthophyllite, tremolite, and actinolite.

fiber - for the purpose of this standard, fiber means naturally-occuring inorganic fiber.

fibril - a single crystal in the form of a fiber.

fibrous particulate - for the purpose of this standard, fibrous particulate designates fibers, fiber fragments and fiber agglomerates.

naturally-occuring inorganic fiber - form of mineral characterized by properties of flexibility and length-to-width ratio in the order of 100, composed of definite crystal unit cells oriented with respect to a specific axis.
Note 1 - The designated 100:1 aspect ratio is considered to represent a reasonable lower limit for naturally-occuring mineral fibers. Fibers of these dimensions can be broken into parts of fibers that may maintain their same surface properties and activities. Therefore fiber fragments may have to be evaluated for atmospheric monitoring purposes. However, attempting to define a fiber by its aspect ratio alone is inadequate since it is obvious that particles of non-fibrous mineral do not become fibers as their aspect ratio increases through comminution.

PRODUCED BY FORD

1. RECOMMENDATIONS FOR AN ASBESTOS STANDARD

The American Society for Testing and Materials (ASTM) recommends that worker exposure to airborne asbestos particulates in the workplace be controlled by requiring compliance with the following sections. This standard is based upon the best atmospheric sampling techniques currently available but it is acknowledged that these are not as precise and accurate as desired. This standard is subject to review and will be revised as needed.

Section 1 - Environmental (work place air)

(a) Concentration

The concentration of airborne asbestos particulates shall be controlled so that workers are not exposed to concentrations exceeding the following values:

Type of asbestos mineral	Monitoring Method*			
	Membrane Filter		Midget Impinger	
	Avg (TWA) fibers/cm^3	Peak fibers/cm^3	Avg(TWA) mppcf	Peak mppcf
Riebeckite (crocidolite)	1	5	2	8
Other varieties of asbestos	5	10	5	10

*Membrane filter; based upon a count of fibers greater than 5 micrometers in length determined by the membrane filter method at 400-450X magnification with a 4 millimeter objective and phase contrast illumination, as described in Appendix 1.

PRODUCED BY FORD

Midget impinger; based upon a count of airborne particles collected by the midget impinger method as described in Appendix 1.

Time-weighted average (TWA) esposure for an 8-hour work day.

Peak concentration determined by a minimum sampling time of 10 minutes.

(b) Sampling

Procedures for sampling, calibration of equipment and analysis of asbestos samples by either the Membrane Filter or Midget Impinger Methods, shall be as described in Appendix 1. Atmospheric monitoring records shall be kept at least three years.

Section 2 - Medical

Medical surveillance shall be exercised as described on all workers exposed to airborne asbestos particulates. For the purpose of this requirement the term 'exposed to airborne asbestos particulates refers to exposures attaining 20 percent of the limits listed in Section 1 for various types of asbestos. The primary objective of this surveillance is to accumulate reliable exposure response data. A secondary objective is to provide guidance for medical management of individuals who show evidence of reaction to past exposure, either due to excessive exposures or hypersusceptibility. However, it is acknowledged that the current state of medical knowledge may not permit successful medical management of such cases beyond therapy for complications of ailments associated with asbestos exposure. Medical surveilance cannot be a guide to adequacy of current controls when medical and environmental data cover only the recent work experience because of the prolonged exposure required for the manifestation of sympthoms related thereto.

Required components of a medical surveilance program include annual measurements of pulmonary function including; forced vital capacity (FVC), and forced expiratory volume for one second (FEV_1), and annual chest roentgenograms (postero-anterior 14 x 17 inches). Additional medical requirement components include a history to quantify smoking habits and to describe details on past exposure to pulmonary hazards and carcinogens, and to determine the presence of absence of pulmonary, cardiovascular, and gastro intestinal sympthoms. A physical examination constitutes and additional required component of medical surveilance, with particular attention to pulmonary rales, and clubbing of fingers.

Chest roentgenograms (X-Rays) and pulmonary function tests will be performed at the employer's expense annually. Preplacement medical examinations and medical examinations on the termination of employment of exposed workers are also required.

PRODUCED BY FORD

Medical records shall be retained by employers for at least 50 years.

Section 3 - Labeling

(a) A warning label for asbestos as shown hereunder shall be used.

CAUTION

CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST

Breathing Asbestos Dust May

Cause Serious Bodily Harm

(b) The warning label shall appear on all containers of asbestos or materials containing loose asbestos.

(c) Materials containing asbestos that are shipped without containers shall be individually labeled except as provided hereunder:

(i) Items that may be marred by labels may be shipped with interleaved labels held in place by the pressure of the items in question.

(ii) Materials containing asbestos that is so efficiently bound as to prevent the release of fiber concentrations exceeding limits stated in Section 1 (a) during manipulation and shaping by foreseable methods, may be exempt from labeling requirements.

(iii) Materials containing asbestos bound, or reacted, in such a way as to give off emanations of dust that can be demonstrated to be non-toxic, when produced by foreseable activities, may be exempt from labeling.

Section 4 - Personal Protective Equipment

This section shall apply under emergency conditions and during periods when limits are exceeded due to unforeseen occurences. Use of respirators must be decided on the basis of peak concentration. When the limits of exposure to asbestos dust prescribed in paragraph (a) of Section 1 are exceeded, the program of respiratory protection described in subsection (a) of this Section, must be put into effect for every worker exposed.

(a) Respiratory Protection

(i) For the purpose of determining the class of respirator to be used, the employer shall measure the atmospheric concentration of airborne asbestos particulates in the workplace whenever process, worksite, climate or control

PRODUCED BY FORD

changes occur which are likely to affect the asbestos concentration. The employer shall test for respirator fit or make determinations of asbestos particulates within the respiratory inlet covering to insure that no worker is being exposed to asbestos in excess of the standard either because of improper respirator selection or fit.

(ii) As noted above, the use of respirators can be decided on the basis of peak concentrations, as tabled hereunder:

Types of Asbestos Mineral	Maximum Peak Concentration			
	Membrane Filter (fibers/cm^3)		Midget Impinger (mppcf)	
	Class A	Class B	Class A	Class B
Riebeckite (crocidolite)	25	250	30	300
Other varieties of asbestos	50	500	50	500

(iii) For peak concentrations exceeding the limits given in Section 1 (a) but not exceeding limits given for class A above in Section 4 (a) (ii), a reusable or single use filter-type air-purifying respirator, operating with a negative pressure during the inhalation phase of breathing, approved under the provision of 30 CFR 14 (Bureau of Mines Schedule 21B) or valveless respirators providng equivalent protection shall be used.

(iv) For peak concentrations not exceeding class B given in Section 4 (a) (ii), a powered air-purifying positive-pressure respirator approved under the provision of 30 CFR 14 (Bureau of Mines Schedule 21B) shall be used

(v) For atmospheres with peak concentrations greater than Class B as given in Section 4 (a) (iii), a type C positive-pressure supplied air respirator approved under the provision of 30 CFR 12 (Bureau of Mines Schedule 19B) shall be used.

(vi) The emplyer shall establish a respirator program in accordance with the requirements of the American National Standard for Respiratory Protection Z88.2 - 1969.

(b) Special Clothing

(i) The employer shall provide, and enforce the use of, special whole body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of fibrous asbestos particulates which exceed the ceiling level prescribed in Section 1 (a) .

PRODUCED BY FORD

(ii) Clothes lockers: The employer shall provide two separate containers for each employee exposed to concentrations exceeding limits stated in Section 1(a), to prevent contamination of the employee's street clothes from his work clothes.

(iii) Laundering: Laundering and maintenance of clothing supplied by the employer shall be the latter's responsibility. The employer must ensure that handling, transportation and laundering are carried out in such a way as to prevent dust concentrations in excess of limits stated in Section 1 (a).

Section 5 - Apprisal of Employees of Hazards from Asbestos

Each worker exposed to airborne asbestos particulates shall be fully apprised of all hazards, relevant symptoms and proper conditions and precautions concerning use, handling or exposure. Each exposed worker shall be informed of the information that is applicable to a specific product or material containing five percent or more asbestos (see Appendix LLL for details of information required). The information shall be kept on file and made available to any exposed worker on verbal request, at all work locations where the concentration of airborne asbestos particulates exceed one half of the limits given in Section 1(a). It is recommended, but not required, that this information be provided wherever workers are exposed in any way to asbestos.

Information as specified in Appendix III shall be recorded on U.S. Department of Labor Form OSHA-20, 'Material Safety Data Sheet', attached hereto, or a similar form approved by the Occupational Safety and Health Administration, U.S. Department of Labor.

Section 6 - Work Practices

PRODUCED BY FORD

Section 7 - Monitoring and Recordkeeping Requirements

Employers are required to maintain records of environmental exposure to airborne asbestos particulates for at least three years. Personal exposure samples will be collected at least annually for specific maximum-risk work operations.

These selected samples will be collected and evaluated as both time-weigted and peak concentration values. The personal sampling regime shall be on a quarterly basis for maximum-risk work areas when environmental concentrations are in excess of the standard.

Records of the type of respiratory protection in use, and of the duration of each usage during the quartely sampling schedule must also be maintained. Quarterly sampling, monitoring and record keeping are required only until environmental levels comply with the standard.

II. INTRODUCTION

2.1 This document presents the criteria and standard based thereon for the prevention of occupational diseases associated with exposure to asbestos.

2.1.1 The data referred to herein is available on loan from ASTM Headquarters.

2.2 The goal of this standard is to prevent significantly diminished functional capacity, or life expectancy, among workers as a result of their work experience, insofar as practicable.

2.2.1 This standard is intended for occupations covered by the Occupational Safety and Health Act of 1970 to the specific exclusion of those covered by the Federal Metal and Nonmetallic Mines Safety Act (30 US. C. 725 et seg.).

2.3 These criteria were developed to ensure that the standard based thereon would satisfy the following conditions:

2.3.1 Protect workers against diseases related to asbestos exposure.

2.3.2 Applicable by means of available monitoring methods.

2.3.3 Possible with existing technology

2.3.4 Feasible economically

PRODUCED BY FORD

2.4 These criteria and the standard based thereon are for the most part taken from previously published criteria and standards, and particularly from those published by the National Institute for Occupational Safety and Health (NIOSH) in 1972. Other criteria were taken from the following sources:

2.4.1 International Labor Office (ILO): Report on Meeting of Experts on the Safe Use of Asbestos, 11-18 Dec 1973.

2.4.2 International Agency for Research of Cancer (IARC): Report of the Advisory Committee on Asbestos Cancers to the Director of the International Agency for Research on Cancer.

2.4.3 National Research Council (NRC) of Canada: Report of the Committee for Scientific Criteria for Environmental Quality (not yet published, probable title: Asbestos in the Canadian Environment).

2.4.4 In addition, criteria were based upon new data, and upon new interpretations of data considered in previous documents.

2.5 This standard and criteria based thereon differs from previous documents on the following points:

2.5.1 Asbestosis is the only disease related to asbestos exposure for which available environmental and epidemiological data is considered sufficient for basing a threshold limit value. Although a dose-response relationship between asbestos exposure and various neoplasia cannot be discounted in view of the paucity of data available, neither can such a relationship be recognized on scientific grounds as opposed to intuitive judgement.

2.5.2 It is recognized that the asbestiform variety of riebeckite (crocidolite) is associated with different degrees of hazard and separate threshold limit values are proposed for this variety.

2.5.3 Available sampling methods are recognized as not entirely adequate. In particular the method based upon a membrane filter, stipulated by NIOSH, is considered advantageous with respect to the exclusion of non-fibrous particles and disadvantageous with respect to reproducibility. On the other hand, the midget impinger method is considered advantageous because much of the long term environmental data available was based upon this method, and disadvantageous to the extent that non-fibrous particles are included. Accordingly both methods are endorsed, with separate threshold limit values corresponding to each method.

PRODUCED BY FORD

ASBESTOS INFORMATION ASSOCIATION
NORTH AMERICA
1650 L Street, N.W. / Washington, D.C. 20036 / (202) 223-4065

15 July 1974

Dr. Daniel P. Boyd
Director, Office of Standard Development
Occupational Safety and Health Administration
1726 M Street, N.W.
Washington, D.C. 20036

Dear Dr. Boyd:

The Asbestos Information Association/North America consists of twenty-two member companies and associations which represent three-quarters of the asbestos mining, milling, manufacturing, and importing industry of the United States. The Association maintains active liaison with trade and technical groups related to the industry. Over a period of time and on numerous occasions, we have consulted with key representatives within the Occupational Safety and Health Adminis tration in a cooperative effort to develop sound safety and health regulations for the industry. We are pleased to enjoy a close working relationship with OSHA.

When the Association learned of plans to revise the Asbestos Standard, as first published in the Federal Register, Vol. 37, No. 110, June 7, 1972, we spoke with Mr. Lewis Cox, Mr. Gerald Scannel and Dr. John P. O'Neill to advise that we would be pleased to take on the task to recommend revisions and develop work practices. We submit, herewith, our recommendations for revising the OSHA Asbestos Standard, as reprinted in the Federal Register, Vol. 39, No. 125, June 27, 1974. We also enclose suggested work practices in the following areas:

A. Unloading and Storing Bagged Asbestos Fiber.

B. Introduction of Asbestos Fiber into Manufacturing Processes.

C. Asbestos Dust and Scrap Removal and Disposal.

D. Housekeeping in the Asbestos Industry.

Please note that we have addressed only those areas where the Association feels the necessity for clarification or better-defined practical application in the interests of ready compliance within the spirit of the Act. Areas not addressed are considered reasonable and enforceable.

8005 1265 PQ

PRODUCED BY FORD

The Association's Standards and Technical Committee, assigned to the task of preparing revisions and work practices, consists of environmental control engineers, industrial hygienists, and safety and health directors. The Committee has consulted extensively with medical, management, labor and other disciplines within the industry. Edmund M. Fenner of the Johns-Manville Corporation serves as chairman of the Committee. Mr. Fenner is well known for his many years of experience in the occupational safety and health field. He is a regular member of the lecturing staff for NIOSH and participates in numerous national technical programs on occupational safety and health as concerns the asbestos industry. A list of other members of the Committee is attached.

The Association acknowledges the importance of disseminating information concerning asbestos regulations and work practices throughout the industry and is performing this function. Much has been done and much more will be done. We are proceeding with the development of work practice materials for member customers who are fabricators and processors of asbestos fiber and fiber-containing products.

We can report that there is an industry-wide appreciation of the health problems associated with asbestos dust in the workplace, requiring realistic understanding and remedial action where necessary.

We are indebted to Dr. O'Neill and Mr. Harry Gilbert for their outstanding assistance and professional guidance. We shall be pleased to meet with you or representatives of your office to discuss our recommendations and any other matters at your pleasure and convenience.

Sincerely yours,

R. H. Mereness
Executive Director

RHM/cg

Enclosures: (1) Recommendations for Revision, OSHA Occupational and Health Standard for Exposure to Asbestos Dust
(2) Suggested Workplace Practices in the Asbestos Industry

PRODUCED BY FORD

STANDARDS AND TECHNICAL COMMITTEE

ASBESTOS INFORMATION ASSOCIATION/NORTH AMERICA

Edmund M. Fenner Chairman
Director Environmental Control
Johns-Manville Corporation
Denver, Colorado

Harold L. Becker
Chief Engineer
Nicolet Industries
Ambler, Pennsylvania

Charles C. Clarke
Industrial Hygienist
The Bendix Corporation
Southfield, Michigan

C. Nelson Codding
Corporate Environmental Control
Jim Walter Research Corporation
St. Petersburg, Florida

Sudhakar Dixit
Industrial Engineer
Garlock, Incorporated
Palymyra, New York

William Fassuliotis
Director Safety and Security
GAF Corporation
New York, New York

John P. McGinley
Director of Manufacturing
Asbestos Cement Pipe and Plastics
Certain-teed Products Corporation
Ambler, Pennsylvania

L. E. Moody
Plant Engineer
Southern Asbestos Company
Charlotte, North Carolina

Fraser Morton
Industrial Engineer
Congoleum Industries, Inc.
Finksburg, Maryland

William H. Mortonson
General Manufacturing Manager
The Flintkote Company
East Rutherford, New Jersey

Dr. H. B. Rhodes
Area Manager
Marketing and Technology
Union Carbide Corporation
Niagara Falls, New York

Isaac H. Weaver
Director Environmental Control
Raybestos-Manhattan, Inc.
Manheim, Pennsylvania

Frank H. Zimmerman
Corporate Director,
Safety and Environmental Healt
National Gypsum Company
Buffalo, New York

PRODUCED BY FORD

RECOMMENDATIONS FOR REVISION

OSHA OCCUPATIONAL SAFETY AND HEALTH STANDARD

EXPOSURE TO ASBESTOS DUST

Prepared by

ASBESTOS INFORMATION ASSOCIATION/NORTH AMERICA

ENCLOSURE (1)

8005 1268

PRODUCED BY FORD

1910.93a Asbestos

(a) (3) Ceiling concentration

Recommended change:

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

Revision to read:

No employee shall be exposed to airborne concentrations of asbestos fibers in excess of 10 fibers, longer than 5 micrometers, per cubic centimeter of air, as determined over a 10-minute period by the method prescribed in paragraph (e) of this section.

Reason:

Limitations of the monitoring procedure make it impossible to determine instantaneous peak exposures. A 10-minute sampling period is a practical minimum.

Note: Phrases in parenthesis are deletions.
Phrases underlined are additions.

8005 1269

PRODUCED BY FORD

1910.93a Asbestos

(c) (1) (ii) (a) Local exhaust ventilation

Recommended change:

Local exhaust ventilation and dust collection systems ..... ANSI Standard Z9.2 - 1971 and American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems for the Control of Asbestos-Containing Dusts, ANSI Z9.5 - 1974, which are incorporated by reference herein, or the equivalent.

Revision to read:

Local exhaust ventilation and dust collection systems shall be designed, constructed, installed, and maintained in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2 - 1971 and American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems for the Control of Asbestos-Containing Dusts, ANSI Z9.5 - 1974, which are incorporated by reference herein, or the equivalent.

Reason:

The Standards and Technical Committee of the Asbestos Information Association/North America has drafted ANSI Standard Z9.5 - 1974. It is anticipated that this standard will be issued prior to the promulgation of the revised Asbestos Standard

Dust control systems can be designed to accomplish the reduction of asbestos fiber levels with less than full adherence to the ANSI design standards.

Note: Phrases underlined are additions.

PRODUCED BY FORD

1910.93a Asbestos

(c) (1) (iii) Particular tools

Don't agree

Recommended change:

Insofar as practicable, all hand operated and power operated tools which in any reasonable foreseeable use may produce or release asbestos fibers in excess ..... shall be provided with local exhaust systems in accordance with subdivision (ii) of this subparagraph.

Revision to read:

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

Reason:

There are certain work situations in which it is not feasible to equip portable tools with dust control equipment.

The use of the phrase "in any reasonable foreseeable use" is in keeping with other portions of the OSHA Standard.

Note: Phrases underlined are additions.

PRODUCED BY FORD

1910.93a Asbestos

(c) (2) (ii) Particular products and operations

Recommended change:

No asbestos cement ..... or similar material containing asbestos shall be removed from bags, cartons or other containers in which they are being shipped without being either wetted or enclosed or ventilated, or otherwise handled so as to prevent effectively .....

Revision to read:

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

Reason:

There may be work practices in addition to those presently specified which may effectively accomplish the purpose of this subparagraph.

Note: Phrases underlined are additions.

PRODUCED BY FORD

1910.93a Asbestos

(c) (2) (iii) Spraying, demolition or removal

Recommended change - Add sentence:

"Where products that have been modified by a bonding agent, coating, binder or other material so that during spraying, demolition or removal, no airborne concentrations of asbestos fibers in excess of the allowable exposure limits will be released, these provisions do not apply."

Revision to read:

Employees engaged in the spraying of asbestos, the removal, or demolition of pipes, structures, or equipment covered or insulated with asbestos, and in the removal or demolition of asbestos insulation or coverings shall be provided with respiratory equipment in accordance with paragraph (d) (2) (iii) of this section and with special clothing in accordance with paragraph (d) (3) of this section. Where products that have been modified by a bonding agent, coating, binder or other material so that during spraying, demolition or removal, no airborne concentrations of asbestos fibers in excess of the allowable exposure limits will be released, these provisions do not apply.

Reason:

There are materials containing asbestos which can be applied by spraying without generating airborne concentrations of asbestos fiber in excess of allowable limits.

PRODUCED BY FORD

1910.93a Asbestos

(d) (1) Personal protective equipment

Revision to read:

Compliance with the exposure limits prescribed by paragraph (b) of this section may not be achieved by the use of respirators or shift rotation of employees, except:

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

(ii) In work situations in which the methods prescribed in paragraph (c) of this section are either technically not feasible or feasible to an extent insufficient to reduce the airborne concentrations of asbestos fibers below the limits prescribed by paragraph (b) of this section;

(iii) In emergencies;

(iv) Where operations involve only occasional handling of small quantities of asbestos fiber, e.g. twice each 8-hour shift or less, and provision of engineering control would impose an unwarranted financial burden;

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

(vi) Where respirators are permitted under subdivision (iv) of this subparagraph, their use shall be subject to the following limitations:

1. Respirator shall not be worn for more than 60 minutes in any 8-hour shift.

2. Respirator shall not be worn for more than 30 minutes in any hour in the 8-hour shift.

3. Exposures do not exceed 10 times the permissible limits and protection can be achieved by use of an air purifying respirator.

PRODUCED BY FORD

1910.93a Asbestos

(f) (2) (ii) Sampling frequency and patterns

(f) (3) (ii) Sampling frequency and patterns

Recommended change:

After the ..... , samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of the employee. Monitoring is not required during usage of products where asbestos fibers have been modified by a bonding agent, coating, binder, or other material so that during any reasonable foreseeable use, handling, storage, disposal, processing or transportation, no airborne concentrations of asbestos fiber in excess of the exposure limits prescribed in paragraph (b) of this section will be released. In no case shall the sampling ..... prescribed in paragraph (b) of this section.

Revision to read:

After the initial determinations required by subparagraph (i) of this paragraph, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of the employee. Monitoring is not required during usage of products where asbestos fibers have been modified by a bonding agent, coating, binder, or other material so that during any reasonable foreseeable use, handling, storage, disposal, processing or transportation, no airborne concentrations of asbestos fiber in excess of the exposure limits prescribed in paragraph (b) of this section will be released. In no case shall the sampling be done at intervals greater than 6 months for employees whose exposure to asbestos may reasonably be foreseen to exceed the limits prescribed by paragraph (b) of this section.

Reason:

Monitoring should not be required in those situations where significant quantities of airborne asbestos fiber are not released.

Note: Phrases underlined are additions.

PRODUCED BY FORD

1910.93a Asbestos

(h) (2) Waste disposal

Recommended change:

Asbestos waste, scrap ..... shall be collected and disposed of in sealed (impermeable) plastic bags or other closed (impermeable) containers.

Revision to read:

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

Reason:

The objective of this subparagraph is to prevent the release of airborne concentrations of asbestos fiber over the permissible exposure limits during waste disposal. The word "impermeable" is highly restrictive and not necessary to fulfillment of the intent through use of "sealed plastic bags or other closed containers."

Note: Phrases in parenthesis are deletions.
Phrases underlined are additions.

PRODUCED BY FORD

1910.93a Asbestos

(b) (2) (3) (4) Medical examinations

Recommended change to each subparagraph:

..... airborne concentrations of asbestos fibers (in excess of one-half the exposure limits specified in section (b) of this standard) .....

Revisions to read:

(2) Replacement. The employer shall provide or make available to each of his employees, within 30 calendar days following his first employment in an occupation exposed to airborne concentrations of asbestos fibers (in excess of one-half the exposure limits specified in section (b) of this standard), a comprehensive medical examination which shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 x 17 inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$).

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

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

Reason:

This is consistent with NIOSH recommendations. Present wording in these subdivisions does not adequately define when medical examinations should be provided or made available. Strict interpretation of the standard, as now written, could result in medical examinations in instances where unnecessary.

Note: Phrases underlined are additions.

PRODUCED BY FORD

1910.93a Asbestos

(j) (6) (ii) Access

Recommended change:

The contents ..... to authorized physicians and medical consultants of either of them, and, upon the written request of an employee or former employee, to his physician.....

Revision to read:

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

Reason:

Practical and prudent procedure is best served by requiring that requests by employees or former employees for medical records be in writing.

Note: Word underlined is an addition.

PRODUCED BY FORD

SUGGESTED WORK PRACTICES

OSHA OCCUPATIONAL SAFETY AND HEALTH STANDARD

EXPOSURE TO ASBESTOS DUST

A. Unloading and Storing Bagged Asbestos Fiber

B. Introduction of Asbestos Fiber into Manufacturing Processes

C. Asbestos Dust and Scrap Removal and Disposal

D. Housekeeping in the Asbestos Industry

Prepared by

ASBESTOS INFORMATION ASSOCIATION/NORTH AMERICA

ENCLOSURE (2)

PRODUCED BY FORD

UNLOADING AND STORING BAGGED ASBESTOS FIBER

1. Prior to unloading bagged asbestos fiber from a boxcar or truck, a visual inspection of the cargo shall be made to determine if bag damage has occurred and the extent of loose fiber present, if any.

2. If the cargo has not been damaged, unloading and transport to storage may proceed normally. Asbestos fiber in undamaged plastic, paper or lined jute bags does not present an exposure problem. Asbestos fiber bags shall be handled and stored in a manner that will protect them from any damage that could create an exposure problem.

3. If visual inspection of cargo reveals bag damage or loose fiber, unloading will not proceed until precautions have been taken to minimize worker exposure.

4. Any loose fiber in the unloading or storage area shall be removed by vacuum cleaning or other suitable methods and disposed of in sealed plastic bags or other closed containers. Damaged bags shall be repaired by taping or by inserting into slip bags. These remedies shall be made before transport of the bag to storage or use point. Approved respiratory protective equipment shall be employed by the worker during this clean-up and unloading operation.

PRODUCED BY FORD

INTRODUCTION OF ASBESTOS FIBER INTO MANUFACTURING PROCESSES

1. Production operations involving asbestos fiber require that fiber be introduced into the process under dust controlled conditions generally achieved by a dust collection system.

2. In those operations where bagged asbestos fiber is being used, the fiber bags shall arrive at the work station in clean condition, free of loose fiber on the bag surface. If the bags are stacked on pallets, the pallets must be clean and free of loose fiber.

3. In operations where the fiber and its container can be introduced directly into the process without opening the container and removing the contents, dust control can be achieved without a dust collection system.

4. Asbestos fiber in the form of compressed block or extruded pellets is virtually dust free and generally can be introduced into a process without need for a dust collection system.

5. In most operations where fiber bags are opened and contents removed prior to introduction into a process, the bag opening station must be equipped with a dust collection system. There may be production operations that do not require a dust collection system to achieve controlled conditions. This can be determined by dust level monitoring.

   A typical fiber bag opening station, with provisions for dust collection, is shown on page of ANSI Z9.5 - 1974, "Fundamentals Governing the Design and Operation of Local Exhaust Systems for the Control of Asbestos-Containing Dusts."

6. Empty bags containing visible residues of fiber shall be placed in closed containers or sealed plastic bags for transport to a disposal site. Empty bags may be placed in closed containers and introduced into a manufacturing operation. Other suitable disposal methods that do not create airborne concentrations in excess of allowable exposure limits may be used.

7. Fiber spills shall be removed as often as necessary by vacuum cleaning or other suitable methods that do not create airborne concentrations in excess of allowable exposure limits.

PRODUCED BY FORD

ASBESTOS DUST AND SCRAP REMOVAL AND DISPOSAL

1. Dust and friable scrap material* shall be handled by methods that do not generate airborne concentrations of asbestos fiber in excess of allowable exposure limits. If such procedures are not available, exposed employees shall wear approved respirators.

2. Friable scrap material for disposal shall be loaded into closed containers or sealed plastic bags for transport to the disposal site.

3. Empty bags containing visible residues of asbestos fiber shall be disposed of in accordance with ANSI Standard Z9.5 - 1974, "Fundamentals Governing the Design and Operation of Local Exhaust Systems for the Control of Asbestos-Containing Dusts" or other suitable procedures.

4. Dust which contains asbestos fibers from collection systems, such as fabric filter baghouses, must either be returned to the process, transported to a waste disposal site in closed containers or sealed plastic bags, or, prior to disposal, converted to dust-free pellets or sludge.

* Friable scrap material is defined as any scrap material that may produce, during the disposal operation, airborne concentrations of asbestos fibers in excess of the allowable exposure limits.

PRODUCED BY FORD

HOUSEKEEPING IN THE ASBESTOS INDUSTRY

1. In plants where asbestos fiber is used, fiber-containing dust shall not be allowed to accumulate on machinery or on the floor, walls, ceiling and structural members of a building to the extent that dust dislodgement could create airborne concentrations in excess of allowable exposure limits. Equipment and buildings must be cleaned as frequently as necessary to meet this requirement.

2. Vacuum cleaning shall be used wherever possible. Other cleaning methods, including wet sweeping, may be employed if usage does not generate airborne concentrations in excess of allowable exposure limits.

3. If it is not possible to remove dust accumulations by vacuum cleaning or other methods, compressed air cleaning may be employed. During compressed air cleaning, only personnel performing the cleaning operations shall be present in the area. Such personnel must wear approved respirators. This operation must be followed by thorough vacuum cleaning or other suitable procedure to remove dust dislodged during the compressed air cleaning.

Don't sit

PRODUCED BY FORD

RS

APPENDIX 5
Document No.20

AMERICAN NATIONAL STANDARD

FUNDAMENTALS GOVERNING THE DESIGN AND OPERATION OF LOCAL EXHAUST SYSTEMS FOR THE CONTROL OF ASBESTOS-CONTAINING DUSTS

DRAFT #2 - 5/2/74

8005 1284

PRODUCED BY FORD

AMERICAN NATIONAL STANDARD
FUNDAMENTALS GOVERNING THE DESIGN AND OPERATION OF
LOCAL EXHAUST SYSTEMS FOR THE CONTROL OF
ASBESTOS-CONTAINING DUSTS

1. SCOPE

1.1 This standard comprises the fundamentals of good practice in industrial exhaust systems installed to prevent unsafe environmental conditions when engaged in mining and milling of asbestos, and the manufacture, fabrication or installation of asbestos containing products.

1.2 The scope of these fundamentals is restricted to normal and typical practice.

1.3 Many of the fundamentals utilized in the design of these systems are set forth in American National Standard Z9.2 - 1971, entitled "Fundamentals Governing the Design and Operation of Local Exhaust Systems". This standard will set forth the fundamentals and specifics related to control of asbestos-containing dusts. Fundamentals not covered will be found in ANSI Z9.2 - 1971, and so referenced.

2. DEFINITIONS

2.1 Dusts. Solid particles containing asbestos fiber.

2.2 Safe Level. Airborne concentrations in the workplace air not to exceed the levels specified by OSHA in the Federal Register, Volume 37, #110 of Wednesday, June 7, 1972. (5 fibers longer than 5 microns - per cubic centimeter, 8 hour time-weighted average, or 20 fibers - longer than 5

PRODUCED BY FORD

2.2 Safe Level (Con'd.)

microns - per cubic centimeter, ceiling value.)

2.3 Additional Definitions

For further pertinent definitions, including those of:

Control Veolcity

Exhaust Rates

Exhaust Hood

Branch

Main

Exhauster

Air Cleaning Equipment

see ANSI Z9.2,1971., Para. 2, page 7.

3. PLANT CONSTRUCTION AND LAYOUT

3.1 Purpose. Consideration of plant layout and construction shall include exhaust ventilation requirements for the purpose of incorporating such requirements in an over-all plan resulting in the optimum combination of capital investment and operating economy for all factors within the control of the designer. Layout based only on production or materials-handling considerations per se may prove uneconomic when necessary exhaust or ventilation requirements are superimposed upon a layout not originally including such considerations.

3.2 Segregation of Hazardous Operations. These operations should be segregated from nonhazardous work so far as practicable. In plants where most of the processes produce harmful concen-

PRODUCED BY FORD

3.2 Segregation of Hazardous Operations. (Con'd.)
trations of air contaminants, it is preferable to isolate the safe operations in a separate building or room.

3.3 Walls and Floors. Walls and floors should be constructed so as to permit easy cleaning and draining. Horizontal surfaces and ledges on which dust may collect should be kept to a minimum.

3.4 Plant Layout.

3.4.1 Location of Processes. Processes to be exhausted by a single system should be located close together and arranged, if conditions permit, in order that:

(1) The shortest lengths of pipe and minimum number of bends may be used in the system.

(2) Proper proportioning of air flow from the various hoods may be facilitated.

3.4.2 Location of Equipment. Equipment to be provided with local exhaust and the components of an exhaust system should be arranged to permit the location of exhaust piping so as to:

(1) Permit the free operation of cranes, elevators, trucks, etc.

(2) Allow ready accessibility to the piping for inspection, cleaning, and repairs

(3) Provide maximum protection of piping from damage from the outside.

PRODUCED BY FORD

3.4 Plant Layout (Con'd)

3.4.3 Separate Systems. Where processes generate different dusts, fumes, or vapors which could, if intermixed, result in a health or an explosion hazard or corrosion, such contaminants shall be exhausted by separate systems so as to eliminate these possibilities.

3.4.4 Isolated Processes. Scattered processes or equipment operated infrequently should be provided with separate exhaust systems.

3.4.5 Air-cleaning Equipment. Building design should make possible the location of this equipment so as to:

(1) Permit safe and ready access

(2) Permit easy removal of dust or other collected material without creating a nuisance or health hazard.

(3) Allow for cleaning and repairing the apparatus without contaminating the general plant air.

3.5 New Make-Up Air Systems. Provision should be made for the entrance of clean, tempered air into the building to replace air removed by exhaust systems. The minimum volume flow of such make-up air should be equal to the exhaust volume.

A more satisfactory in-plant environment can be provided if the supply air exceeds the exhaust. Common practice is to increase the supply air 10 percent above the exhaust volume. A more accurate method of determining the supply volume is to increase the supply above the exhaust by a volume equal to the infiltration

8005 1288 PQ

PRODUCED BY FORD

3.5 New Make-Up Air Systems (Con'd)

rate as determined from standard heat loss calculations. (This will eliminate the necessity to include the infiltration in the building heat loss calculations.) An exception to this is a situation where it is desirable to maintain the space under a slight negative pressure.

For additional information on make-up air systems, refer to ANSI Z9.2, 1971, paragraph 3.6, page 9.

4. EXHAUST HOODS

4.1 Purpose. It is the purpose of exhaust hoods to enclose, as effectively as practical, the points where the contaminant is released, or to create air flow through the zone or zones of contaminant release of such magnitude and direction as to carry the contaminated air into the exhaust system. Exhaust hoods and enclosures may also serve the important function of keeping materials in process by preventing their dispersion.

4.2 Production and Dispersion of Contaminants. Distinction should be made between the production of a contaminant and its dispersion. Contaminants are often produced without contamination of the atmosphere; on the other hand, dusts are frequently dispersed from areas where they are not produced.

4.3 Kinetic Energy of Atmospheric Contaminants. The method by which particulate contaminants become airborne determines the kinetic energy level.

8005 1289 PQ

PRODUCED BY FORD

4.3 Kinetic Energy of Atmospheric Contaminants (Con'd)

$$KE = \frac{1}{2} MV^2$$

where

KE = kinetic energy
M = mass
V = velocity

Contaminants have low kinetic energy when they have small mass or are released with low velocity.

4.4 Dispersion of Atmospheric Contaminants. Atmospheric contaminants are dispersed in one or both of two ways:

4.4.1 Dispersion by Kinetic Energy. Particulate contaminants are projected into the air by the kinetic energy imparted to them at the time of their production or applied later by the process. Such contaminants travel through the air until their kinetic energy is dissipated in overcoming air resistance. The distance traveled depends primarily upon the mass. Since particles of hygienic significance (usually 10 microns and less) (molecular state) have very small mass, their dispersion by kinetic energy is very limited. For instance, a 10-micron particle having an initial velocity of 10,000 feet per minute will have dissipated its energy after having traveled about 1.5 inches. A 2-millimeter particle having the same initial velocity will travel about 140 feet through still air before its energy has been dissipated.

8005 1290 PQ

PRODUCED BY FORD

4.4.2 Dispersion by Air Currents. Particles of hygienic significance are usually dispersed by air currents.

4.5 Types of Air Motion. Stray or secondary air motion around industrial processes and operations may be classified into four major types:

(1) Motion or energy fundamental to the machine or process (viz, fan action of a rotating wheel, escape of air from containers as they are filled, convection currents and air expansion over heated surfaces)

(2) Forces incidental to the operation of the machine or process (viz, air escaping past worn pistons in pneumatic tools or from badly placed exhaust ports, and vibration of machinery)

(3) Drag of air by large particles dynamically projected from their source (viz, large particles dispersed from a surfacing machine carrying fine particles in their wake)

(4) External forces (viz, air motion created by nearby machinery operation and by workers; natural convection currents caused by temperature changes; and air currents from nearby doors or windows, fans or heaters)

4.6 Control of Air Motion. The primary purpose of an exhaust hood is to confine or capture contaminated air, or both, rather than to remove the contaminating material from the air. To prevent the dispersion of atmospheric impurities, it is necessary to eliminate or reduce stray or secondary air currents and to develop primary or control air currents of the proper magnitude and direction about the zone of dispersion. Before the actual design of an exhaust hood is undertaken it is essential for

PRODUCED BY FORD

4.6 Control of Air Motion (Con'd)

economic reasons to eliminate or reduce the effects of dispersing air currents by direct, nonventilation means. Any such mechanical improvements must be permanent in nature lest their subsequent alteration or removal render the exhaust system inadequate. These preliminary measures include:

(1) Altering the design or operation of the process, as for example, in changing the location of the compressed air exhaust on a pneumatic tool.

(2) Deflecting or eliminating external air currents, as from nearby moving machinery, open windows, space heaters, or air-supply grilles.

(3) Preventing the machine from creating undesirable air currents by the use of suitable baffles or enclosures, so as to

(a) Utilize the motion of the machine to produce air currents toward the proposed exhaust hood, or

(b) Prevent the development of adverse extraneous air motion by the machine (such as the fan action of a grinding wheel).

(4) Installing the hood so that it transects the path of dynamically projected particles. If this is not desirable, as in materials-handling systems, baffles should be installed to destroy the motion of coarse particles and, with it, the air drag which causes the dispersion of minute particles.

(5) Restricting the free entry of air at the point of material entry on operations (such as hopper filling) where ambient air is entrained with the materials being processed. Dispersion

8005 1292 PQ

PRODUCED BY FORD

4.6 Control of Air Motion (Con'd)

of contaminant-laden air by the "fan action" of the moving material thus may be reduced.

(6) Eliminating unnecessary vibration of machinery.

These measures will not ordinarily eliminate the need for exhaust ventilation but are of great practical value in reducing the required size and capacity of the exhaust system.

4.7 Hood Design. The primary objective of hood design is to confine or capture the contaminant effectively with a minimum rate of air flow into the hood. The important factors are the air velocity in the area of contaminant dispersion, the area or volume of the dispersing mechanism and the volume rate of air exhausted. The air velocity toward the hood must be great enough to counteract the opposing velocity of the contaminated air and the influence of stray or secondary air currents. The rate of air exhausted must be such as to capture enough of the contaminant to maintain in the breathing zone of nearby workers a safe level of whatever contaminant remains.

4.8 Determination of Required Air Velocity. The air velocity which must be developed by the exhaust hood at the point or in the area of desired control is based on the magnitude and direction of the air motion to be overcome and is not subject to direct and exact evaluation.

PRODUCED BY FORD

4.9 Air Volume Requirements for Exhaust Hoods. Exhaust hoods should be so designed and located as to provide the necessary air velocity with the lowest possible air flow. The following general rules should be observed:

4.9.1 Enclosure of Process. The process should be enclosed as much as possible (see Fig. 1).* The practical necessities of operating the process must, of course, be taken into account. Too complete enclosure of a process may result in economic penalties in terms of operating efficiency, or capital expenditure greater than that for the larger exhaust system required by a less complete enclosure; an economic balance should be maintained between the two extremes. The quantity of air required for enclosing or partially-enclosing hoods is determined by two factors:

(1) The air velocity through all openings must be great enough to prevent the escape of contaminated air, and the air volume must be sufficient to carry away all air or gas introduced into or created within the enclosure. In the design of the hood, special attention must be paid to the fit around rotating shafts, etc. and to the selection of air volume so that there will be an adequate flow of air into the hood at these points.

(2) The velocity within the enclosure should be high enough to remove the contaminant from the hood, except that the velocity should not be high enough to carry away

*ANSI Standard Z9.2 1971, page 14

PRODUCED BY FORD

4.9 Air Volume Requirements for Exhaust Hoods (Cont'd.)

4.9.1 Enclosure of Process (Cont'd.)

valuable products unless these are recovered later. In some applications the velocity in the enclosure need not be high enough to prevent settling; in this case, provision should be made for the easy removal of settled dust. When settling is not permitted, the air inlet location and exhaust nozzle connection are important design factors.

In general, enclosing hoods should not also enclose the worker, the worker will usually require extensive personal protective equipment, as for example in totally enclosed sand-blast rooms.

4.9.2 Location of Non-enclosing Hoods. Exhaust hoods that do not enclose the process should be located as close as possible to the point of contaminant dispersal and should provide air flow in the direction from the worker to the contaminant source (see Figs. 2 and 3).* Air velocity created by the exhaust hood, for all but long slot-type hoods, varies approximately inversely with the square of the distance from the hood opening. For long-slot type hoods, it varies inversely with distance.

* ANSI Standard Z9.2 1971, pp. 15 and 16

PRODUCED BY FORD

4.9.3 Utilization of Air Currents. The hood or part of it should be located so as to utilize the directional tendency of the motion of the contaminated air for its own capture (see Fig. 4).* In some cases, however, the hood opening must be normal to the directional tendency in the motion of the contaminated air, or remote from the main contaminant concentration, in order to reduce the amount of material picked up.

4.9.4 Baffles and Flanges. Baffles for minimizing cross drafts, and hood flanges for increasing hood efficiencies are important elements to be considered in hood design.

4.10 Calculations of Airflow. For detailed information on the calculation of air flow through hoods refer to ANSI Z9.2-1971, paragraph 4.10, page 14.

*ANSI Standard Z9.2 1971, page 17

PRODUCED BY FORD

4.11 Specific Hood Designs. Some special considerations for asbestos processing:

4.11.1 Transfer Points

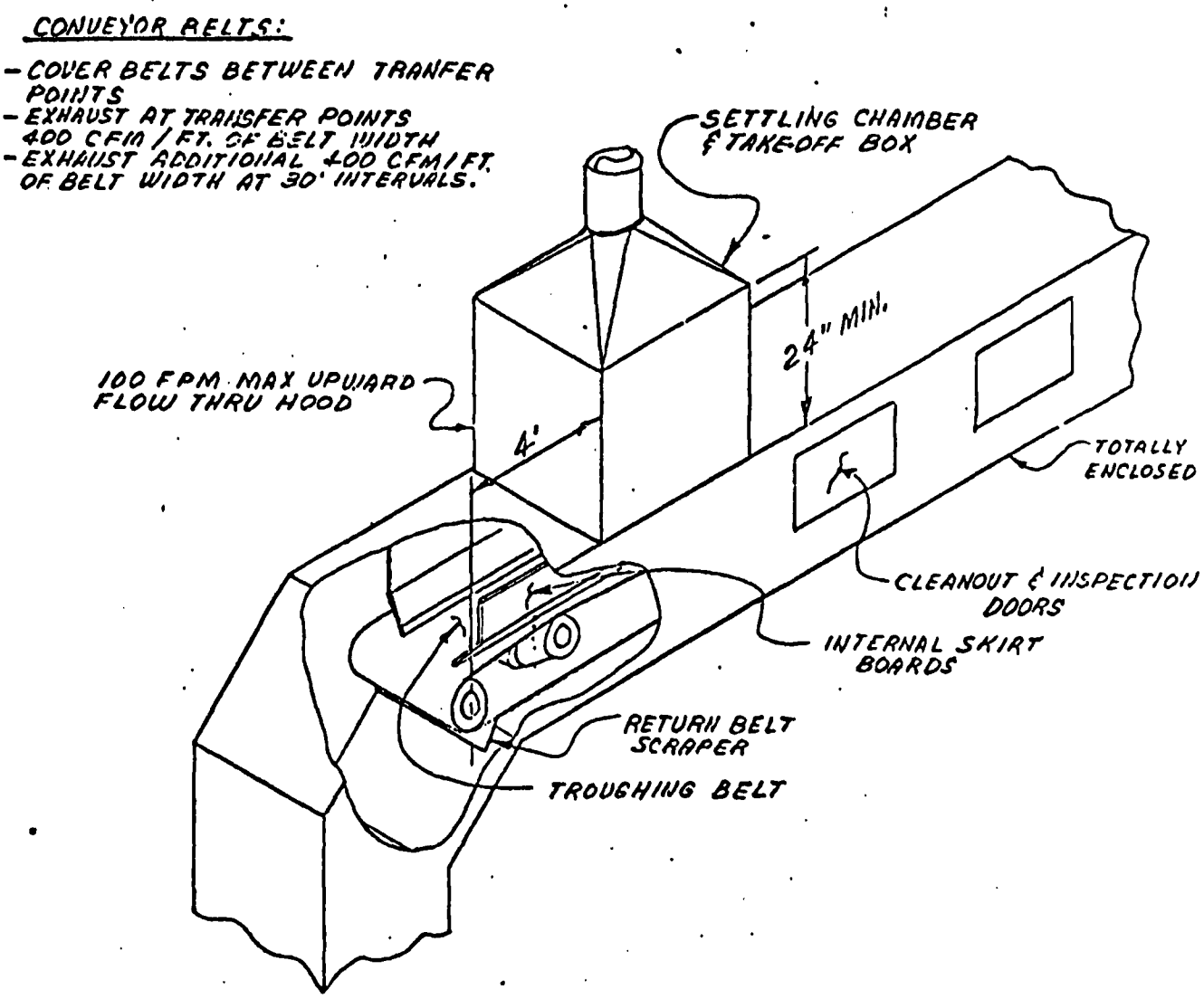
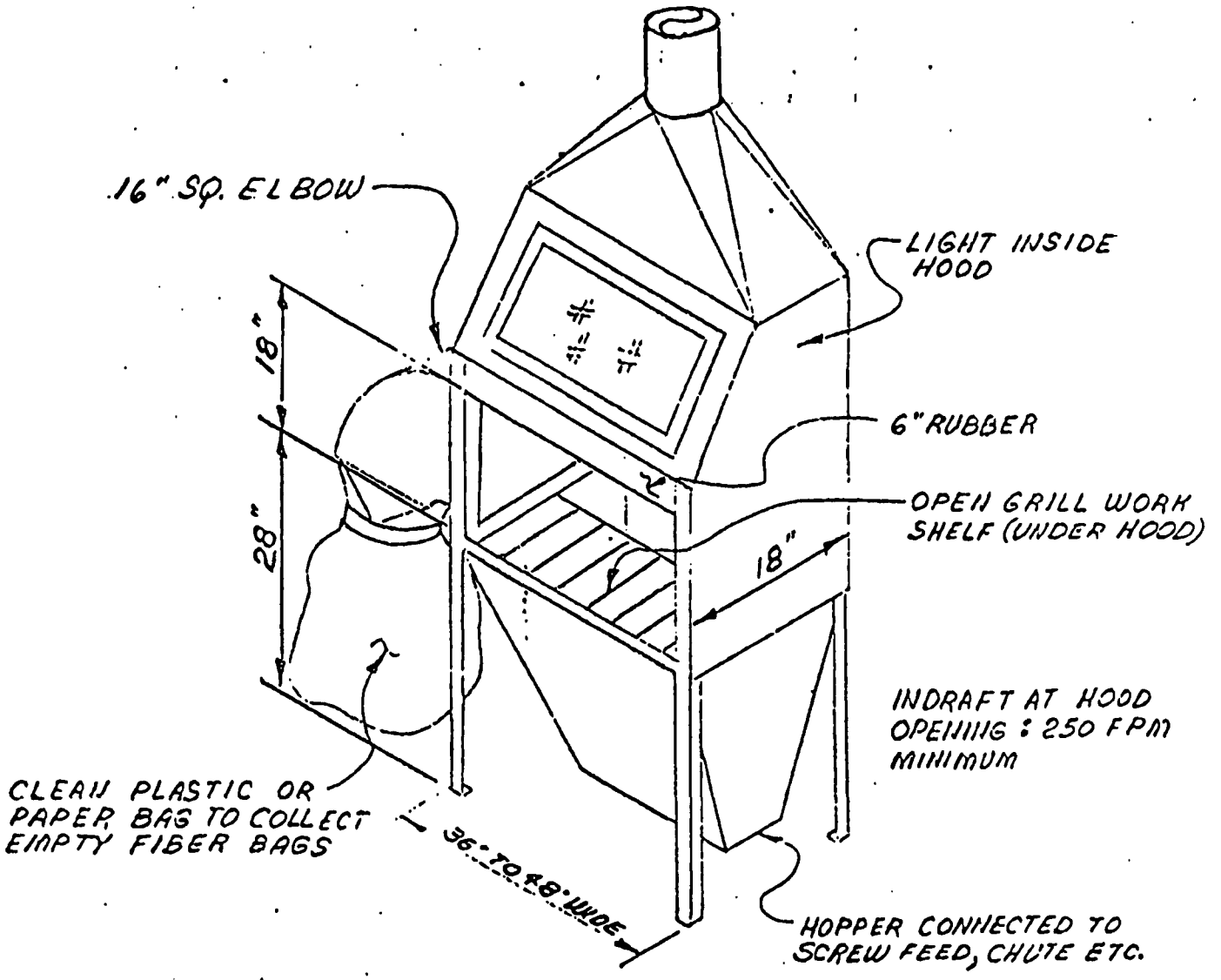


Fig. A

CONVEYOR BELT ENCLOSURE

8005 1297

4.11.2 Asbestos Fiber Bag Opening Stations



8005 1298

PRODUCED BY FORD

4.11 Specific Hood Designs (Cont'd)

4.11.2 Asbestos Fiber Bag Opening Stations (Cont'd)

These operations should be enclosed that there is an exhaust air interface between the operator and the dust producing operation. The bag must be opened completely under a ventilated hood and disposed of under ventilation, per Fig. B , (see para. 4.11.4 for notes on bag disposal.)

4.11.3 Non-Enclosing Hoods. This type of hood should be avoided and only used as a last resort after determining that enclosing the process is impossible. When necessary to use this type of hood, flanges and skirts are necessary. Without them excessive volumes of air will be required to effectively control dust at any distance from the hood face.

4.11.4 Empty Bag Disposal. The handling of empty, asbestos bags generally produces significant quantities of fine asbestos dust. Empty bags must be disposed of in a controlled manner. Following are some methods to accomplish this:

PRODUCED BY FORD

4.11 Specific Hood Designs (Cont'd.)

4.11.4 Empty Bag Disposal (Cont'd.)

(1) Bag disposal into a clean bag in conjunction with a ventilated bag opening station. (See fig. 2, pg 14)

(2) Pneumatic disposal of the bags to a trap, with the exhaust air going on to a cloth bag-type dust collector. The collected empty asbestos bags can then be fed by gravity into a clean container or baler, for disposal.

(3) Shredding of the paper bags and removal pneumatically, as above, or by slurry method, or re-fed into a wet process that utilizes paper.

(4) Automatic bag opening and bag disposal equipment used in conjunction with baler or pneumatic conveying, is available.

Manufacturers of bag opening devices that claim the ability to open pressure packed asbestos fiber bags are:

Fairmont Engineering
216 Stiger St.
Hackettstown, N.J.

Taunton Engineering Company
700 West Water St.
Taunton, Mass. 02780

Stuart Glapat Corp.
1639 Moxahala Ave.
Zanesville, Ohio 43701

PRODUCED BY FORD

5. EXHAUST DUCTS

5.1 Purpose. The purpose of the exhaust duct work is to control the flow of air, in the desired quantities and at the desired velocities, from each exhaust hood to the point of discharge.

5.2 Duct Systems.

5.2.1 For general consideration refer to ANSI Z9.2-1961, para. 5.2, page 17.

5.3 Conveying and Design Velocities.

5.3.1 A distinction is made between "transport velocity" ("conveying velocity") and "design velocity" for dusts. Transport velocity is the minimum velocity required to keep the dust moving through the duct. Design velocity is generally higher than transport velocity for the following reasons:

(1) To provide a factor of safety to insure the maintenance of transport velocity in the main in the event of closure of one or more branches, leakage of duct work, corrosion or erosion of the fan wheel, increase in system resistance due to denting of duct work, and other causes

(2) To balance systems having a number of branches

(3) To allow the use of smaller size ducts.

5.3.2 Recommended minimum air velocities.

Duct risers - 4100 fpm

Horizontal ducts - 3900 fpm

PRODUCED BY FORD

5.4 Air distribution.

For detailed information on air distribution, and methods of air balancing, refer to ANSI Z9.2-1971, paragraph 5.4, page 20.

5.5 Duct design data.

For detailed data on duct design, refer to ANSI Z9.2-1971, paragraph 5.5, 5.6, 5.7 and 5.8; pages 22 through 37.

5.6 Special design considerations.

5.6.1 Ducts must be designed for abrasive service.

(1) Milling: Rock Line - 12 Ga. - All sizes
Fiber Line - 14 Ga. - All sizes
Dust Control - 16 Ga. - up to 30" and
14 Ga. - over 30"

(2) Fiber Handling: Conveying - 14 Ga. - All sizes
Dust Control - 18 Ga. - 5" to 12"
16 Ga. - 13" to 30"
14 Ga. - over 30"
Fittings - 2 guages heavier - all sizes

(3) Special cases (especially rock handling) - experience may show that some areas will require special extra heavy design, such as "wear-back" elbows and wear plates on fittings.

PRODUCED BY FORD

6. AIR CLEANING EQUIPMENT

6.1 Definition. Air cleaning means the separation of contaminant from the air handled by ventilating systems. The term "air cleaning" as used in this standard is restricted to the separation of contaminants from the air handled by local exhaust systems.

6.2 Purpose. Air cleaning is required for one or more of the following reasons:

(1) To prevent the creation of a hazard or nuisance in the area exposed to the discharge of the local exhaust system.

(2) To prevent recontamination of the plant air from the discharge air.

(3) To protect fans or other air-moving equipment.

(4) To permit recirculation of the exhausted air, under certain circumstances, in order to reduce heating or cooling losses from the plant.

(5) To recover valuable materials that may be present in the exhausted air.

6.3 Pollution.

6.3.1 Air cleaning equipment is required in exhaust systems handling asbestos fibers.

6.3.2 Local legal requirements may be more stringent than indicated by the above factors. Such requirements are usually a matter of public policy and are concerned with a general or area-wide pollution problem not attributed to any specific or single source.

PRODUCED BY FORD

6.4 Characteristics of Air Cleaning Equipment. The perfect air cleaner does not exist; equipment selected should possess as many as possible of the following characteristics:

6.4.1 Degree of Cleaning. The concentration and mass rate of emission of the contaminant in the cleaned air shall be sufficiently low that neither hazard nor nuisance is created inside or outside the plant.

6.4.2 Legal Requirements. The concentration and mass rate of emission of contaminant in the cleaned air should be below that specified by existing state or local codes, or below that which might reasonably be anticipated in future codes.

6.4.3 Uniformity of Performance. Emission rate, capacity, and resistance of the air cleaner should remain relatively constant throughout its daily operating cycle and be nearly independent of entering dust concentration.

6.4.4 Maintenance and Cleaning. The routine maintenance and cleaning of the air-cleaning plant should not interfere with normal operation.

6.4.5 Re-use or Disposal of Collected Material. Collected material should be in such form or condition as to facilitate safe disposal or economic re-use.

6.4.6 Resistance. The pressure drop should be as low as is consistent with other characteristics desired.

PRODUCED BY FORD

6.4 Characteristics of Air Cleaning Equipment (Cont'd.)

6.4.7 Construction. Equipment should be compact, ruggedly constructed, easily inspected and maintained. Important factors in construction considerations are abrasion, corrosion and temperature.

6.5 Types of Air Cleaners. Many types of air cleaners are available and are discussed thoroughly in the literature. The first recommendation of the Federal Environmental Protection Agency for asbestos dust collection is a fabric bag filter. The Federal Environmental Protection Agency recommends an alternate for use in certain circumstances as stated in Paragraph 6.5.3.

The Federal Environmental Protection Agency will accept air cleaning devices if they are proved as effective as their basic recommendations. (See Appendix A)

6.5.1 Fabric Bag Filter - Mechanical Shake. This type of collector is better than 99% efficient in collecting asbestos containin dusts when properly sized, operated and maintained. It should have following specifications:

(1) Mechanical shaker type with air/cloth ratios of 2.0:1 to 2.5:1.

(2) Cloth cotton sateen bags, silicone-treated.

(3) Cloth permeability - See Appendix A.

(4) Cloth weight approximately 9.6 oz./sq. yd; count 96 x 60.

(5) Heavy duty shaking mechanism.

(6) Hoppers to have 60° minimum slope and their inside surfaces to be smooth and free of weld spatter.

(7) Minimum discharge gate opening of 12" x 12" to minimize fiber hang-up in the hopper.

(8) Solid-state timer to automatically shake the bags on fan shut-down.

PRODUCED BY FORD

6.5 Types of Air Cleaners (Cont'd.)

6.5.1 Fabric Bag Filter (Cont'd.)

(9) Manometer for continuous observation of operating condition of cloth bags.

Additional preferred features might include:

(10) Continuous-duty type (compartmentized) designed to allow cleaning or maintenance without reduction of dust control on the production system. Provide close-fitting dampers for positive isolation of each compartment while shaking.

(11) Minimum 12" x 12" rotary valves on the hopper discharge to allow continuous disposal of collected asbestos dust to avoid material hang-up in hoppers. It would be advantageous to have an air tight slide valve above the rotary valve to seal the hopper during maintenance of the rotary valve.

(12) Trough hoppers with min. 9" screw conveyors and 12" rotary valves for most trouble-free disposal of fibrous dust.

(13) Means of access to compartments while operating for maintenance purposes.

(14) Cloth envelope collectors should be avoided due to excessive bridging of fibrous dust between the envelope.

(15) Inspection ports and internal lighting.

6.5.2 Fabric bag filter - reverse jet type. Reverse jet types Reverse flow types of collectors with air/cloth ratios of the order of 6:1 and felt tubes and utilizing compressed

PRODUCED BY FORD

6.5 Types of Air Cleaners (Cont'd.)

6.5.2 Fabric bag filter - reverse jet type (Cont'd.)

air jets or an auxiliary fan for reversing air flow through the tubes for cleaning purposes can be used successfully on fibrous dust. They require less space than mechanical shake collectors operating at lower air/cloth ratios. However, they are not recommended for asbestos due to the maintenance disadvantage of requiring work and handling of asbestos covered bags on the dirty air side.

Where space considerations outweigh the inherent maintenance disadvantages connected with the reverse flow type collectors, and such units are installed on applications involving asbestos-containing dust, the following precautions are recommended:

(1) Maintenance personnel entering such collectors for tube inspection, repair, or replacement shall be protected by means of approved respirators and protective clothing.

(2) Precautions shall be taken to prevent escape of asbestos-containing dust from collector access openings during inspection and maintenance procedures, and any spillage of such dust shall be cleaned up immediately by vacuum system or by wet sweeping.

(3) On applications involving collection of bulky fibrous waste materials, care should be taken in selecting

PRODUCED BY FORD

6.5 Types of Air Cleaners (Cont'd.)

6.5.2 Fabric bag filter - reverse jet type (Cont'd.)

(3) (Cont'd.)

collectors to make certain sufficient clearance exists between tubes to preclude possibility of bridging of accumulated material in the space between tubes. This may require special spacing of tube centers in the tube sheet or the use of smaller diameter tubes than are normally supplied in this type of collector.

(4) Only clean dry compressed air is supplied to cleaning nozzles.

6.5.3 Other Collectors. A federal Environmental Protection Agency recommended alternate to a fabric bag filter is a high energy wet scrubber (See Appendix A). However, it is recommended only under the following operating conditions:

(1) Fire or explosion hazard

(2) Where high moisture content of the exhaust air would create condensation in a dry collector with resultant operating and maintenance problems.

The cleaned air from this type of collector should not be recirculated into the plant.

6.6 Pre-Cleaners. When exceptionally heavy dust loadings are encountered, (over 10 grains/cu. ft. of air) pre-cleaning of the air stream should be done to reduce wear on the cloth

PRODUCED BY FORD

6.6 Pre-Cleaners (Cont'd.)

6.6.1 Settling Chamber. A large chamber with relatively low velocities (and sometimes a rapid change in direction) to utilize gravitational settling. Simplest arrangement is an inlet plenum on the end of the fabric bag filter so collected dust falls into the collector hoppers, eliminating the requirement for additional dust disposal facilities.

6.6.2 Inertial Traps. Similar to above but utilize specifically designed direction changes to add inertial settling to gravitational forces.

6.6.3 Cyclones. For higher efficiency pre-cleaning, especially in process work, a specifically designed, high efficiency (by weight) mechanical type of dust collector should precede the cloth collector. The cyclone is the simplest and most economical device for this purpose.

6.6.3.1 For detailed information on design of cyclones, refer to ANSI Z9.2-1971, paragraph 6.8, page 38.

6.7 Field Testing. Reputable manufacturers of proprietary air-cleaning equipment are often able to offer guarantees of performance of their equipment based on experience or on pilot installations with the materials or operations in question. Laboratory tests are often unreliable because of the inability to duplicate all field conditions, such as the degree of dispersion of the contaminant, electrostatic charges on particles, variations in loading, etc. Therefore, especially where a process or material

PRODUCED BY FORD

6.7 Field Testing (Cont'd.

is new, a pilot installation should be made and studied at the process site. Since the questions of maintenance of adequate collection efficiency and performance, wear on equipment, etc., are more important than operating characteristics when the material or process is new, the pilot installation should be operated and studied over a long enough time period (sometimes a year or more) to permit accurate conclusions. The test data should include measurements of the contaminant loading in both dirty and clean air streams, preferably over a wide range in a variation of factors (such as water rate and air-flow rate) which may substantially affect the collecting efficiency. All measurements of contaminant concentration should be performed by standard methods and techniques.

7. EXHAUSTERS

7.1 Definition

7.1.1 The term "exhauster) as used herein refers to any device which may be used to create the required flow of air in a local exhaust system.

7.1.2 An exhauster may be any one of the following:

(1) Fan

(2) Turbo-compressor

(3) Positive displacement blower

(4) Ejector

7.2 Fans. A fan is the only type of exhauster suitable for the local exhaust systems described in this standard. The accepted

PRODUCED BY FORD

7.2 Fans (Cont'd.)

those of the Air Moving and Contitioning Association, Inc. Fans are usually of two main types, centrifugal or axial. In a centrifugal fan the outlet is in a plane normal to the inlet. In the axial fan, the air leaves in the same direction that it enetered. (See Fig. 21.)

7.2.1 Centrifugal Fans. A centrifugal fan consists of a fan rotor or wheel within a scroll-shaped housing, and includes driving-mechanism supports either for belt drive or direct connection.

Centrifugal fans are classified according to the type of rotor blade used. The main types of centrifugal fan wheels are forward curved, radial blade or paddle type, and the backward curved blade. Combinations of these three basic types can and have been made.

Centrifugal fans are also classified according to the rigidity of construction.

7.2.1.1 For use with the fabric bag filter collectors recommended herein a centrifugal exhauster with a radial or backward-curved wheel is recommended. For detailed description of these units, refer to ANSI Z9.2-1971, para. 7.2.1, page 4

7.3 Fan installation.

7.3.1 The exhauster preferably should be installed on the clean-air side of the collector for the following advnatages:

(1) Wear is a minimum since it does not handle abrasive dust.

(2) It can be a high-efficiency, backward-curved blade

PRODUCED BY FORD

7.3 Fan installation (Cont'd.)

7.3.1 (Cont'd.)

type, when volume and pressure indicate a significant saving of horsepower.

(3) Any air leaks in the system and dust collector housing will be inward, preventing dust blowing out into the area.

(4) Any dust leak, such as a broken bag, will be limited to the fan discharge stack. The stack should be readily visible so exhaust stream character can be used as a signal that maintenance is required.

However, there are instances where it may be preferable to locate the fan between the dust source and the collector. In a positive pressure installation of this type, the dust from fan to collector should be kept as short as possible and be completely air tight. Such instances might be

(1) Eliminate potential water leakage problems associated with the collectors installed outdoors.

(2) Permit minor servicing while unit is in operation.

7.3.2 A discharge evasee (expansion cone) should be used where required to reduce air velocity to about 3,000 fpm for maximum static pressure regain, maximum efficiency and minimum stack loss.

8. CONSTRUCTION AND INSTALLATION

PRODUCED BY FORD

9. OPERATION AND MAINTENANCE

10. CHECKING OPERATION OF LOCAL EXHAUST SYSTEMS

For recommendations on 8., 9. and 10 above, refer to ANSI STandard Z9.2-1971

PRODUCED BY FORD