#2

FROM GEORGE H. FARRAH
ENVIRONMENTAL HEALTH LABORATORY
ALCOA TECHNICAL CENTER

TO INDUSTRIAL HYGIENISTS

April 17, 1972

RE: INDUSTRIAL HYGIENE NEWSLETTER - ASBESTOS DUST EXPOSURES

Mr. R. P. Carter's Newsletter dated December 23, 1971, concerning the OSHA emergency standard for asbestos has led to many requests for advice in determining compliance with the new Federal standards. This letter attempts to point out the more likely areas of exposure to asbestos dust, general reduction of worker exposures and includes sampling and analytical methods to determine if you are in compliance with any promulgated OSHA standard referring to asbestos.

The principal asbestos-containing materials of concern (apart from building insulation and pipe covering) are Molten Metal Marinite (Johns-Manville), asbestos shorts and insulating block used in smelting cells and furnaces of all types. Marinite constitutes a problem from the point of delivery of sheet stock, through storage and handling, all machining operations, removal of used material, to disposal of wastes. Asbestos shorts, as currently used, may present dust problems during transfer and mixing of the dry material in preparation of mortar, and in removal of old linings. According to Mr. H.M. Short, practically all the insulating (back-up) block used in smelting cells and in all types of furnaces contains 8% asbestos. This means that the operations of removing old lining from furnaces and cells, and even the relining, can create asbestos dust exposures. Asbestos is also used in other forms, such as paper and rope, and in a variety of applications - but principally as high temperature gasket. Wherever asbestos is routinely used, and in whatever form, we must take a careful look at exposures, not only of those handling the material, but of other workers in the vicinity. As mentioned in the December 23 Newsletter, this concern applies as well to the demolition of asbestos-covered structures, pipes, etc.

In starting an asbestos dust control program, the first step should be the listing of all forms and applications of asbestos-containing materials. This information should be readily available from the Process Materials List which all plants should have prepared and which they should maintain as current information. Next, all operations involving asbestos should be critically inspected. In many cases, it will not be necessary to collect samples and count fibers to recognize that concentrations are too high. If inspection of the operation shows a visible dust cloud, or if there is a layer of asbestos dust on surrounding surfaces, control measures must be instituted at once. Many of these measures are specified in the Federal Register of Tuesday, December 7, 1971; there are also some useful suggestions in the copies of Insulation Hygiene Progress Reports which were attached to the December 23, 1971, letter.

Most shops in which Marinite is processed have exhaust ducts attached to lathes, table and bandsaws, routing machines, etc. Power hand tools are similarly equipped and connected to the exhaust system. Some of these do a fairly good job of capturing dust, others are of little value. To be effective, enclosures must be virtually complete, with

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high capacity exhaust systems. Furthermore, exhaust systems must be connected to collection systems which meet the performance standards set forth in the Federal Register, December 7, 1971, page 23208, Section 1910.93a and pages 23242-23243, Sections 61.23 and 61.24. There should be no visible emissions from discharge of the collection system. This discharge should be to the outside and directed away from any windows that may be opened, to avoid any possibility of dust being blown back into the workroom. Where the collector discharge is directed against the side of a building and has resulted in a readily visible brown deposit, collection efficiency may well be questioned. Assistance with your control problems can be obtained from the Pittsburgh Environmental Engineering Division.

The handling of dry asbestos shorts may be avoided by purchase of this material in plastic bags equipped with hose connections which permit wetting of the contents before the bag is opened. Wet-digging of old trough and furnace linings, where this is permissible, will reduce the generation of dust. If wet removal and replacement of lining is done in the open, provision should be made for adequate clean-up, including flushing away of fines, so that dust will not blow about as the work area dries. In all cases, clean-up must be done by means of vacuum cleaners and not by dry sweeping. Asbestos wastes should be collected and disposed of in sealed bags as required by the existing standard.

In removing old furnace and cell linings, wetting the exposed surfaces to minimize dust should be employed wherever practical. Again, the Pittsburgh Environmental Engineering Division should be consulted on the practicality of exhaust from the working area, especially during lining removal.

After installation of all appropriate control measures, even though there is no visible dust, an air sampling program will be necessary to determine whether respiratory protection may be discontinued. If levels of dust are above the standard permitted, the actual levels will establish the type of respiratory protection required. The emergency standard for asbestos dust published in the Federal Register of December 7, 1971, established the approved method for counting the fibers in a sample. When this level was proposed as a permanent standard in the Federal Register of January 12, 1972, (Attachment #1) some of the details of sampling were also spelled out, along with requirements for warning signs, environmental sampling, and medical examinations. Early in February, NIOSH published a criteria document on asbestos dust recommending a still lower fiber count as the standard. The detailed method for sampling, counting and calculating the fiber concentrations which was contained in this document is given in Attachment #2. Attachment #3 is a copy of OSHA Sampling Data Sheet #2 which contains additional helpful information. Regardless of the concentration which is established as the final standard, these sampling and analytical procedures will apply.

Sampling to determine worker exposures will be the responsibility of each plant and suitable equipment must be purchased, if it is not already available. The decision to evaluate samples in-house or to send them to a commercial laboratory will depend upon availability of personnel and equipment, and the volume of work anticipated. While our Environmental Health Laboratory will be equipped to make these evaluations for the Technical Center, the anticipated demand would be too great if we were to offer our services, company-wide.

Collection of samples is most conveniently done with pre-loaded filters and a small, battery powered pump of about 2 liters per minute capacity, such as the following:

Pre-loaded Filters

Millipore Field Monitors, Cat. No. MAWP 037 AO
Price per carton of 50 $30.00
(available from Millipore Corp., Bedford, Mass. 01730)

Battery Powered Pump

1. MSA Portable Pump Assembly, Model G,
Cat. No. 456058 $160.00
(Requires MSA Battery Charger Assembly,
Model G Pump, Cat. No. 456059) $ 40.00

Mine Safety Appliances Co.
201 North Braddock Avenue
Pittsburgh, Pa. 15208

or

2. NEI Micronair Personal Air Sampler,
Cat. No. 3900-10, complete with Nicad
battery and charger $195.00

National Environmental Instruments, Inc.
1865 Post Road
Warwick, R.I. 02888

Counting the fibers collected on the filters requires the use of a microscope equipped for phase contrast illumination, and a good quality microscope lamp, preferably one capable of providing Köhler illumination. To adape a given microscope for this work, the manufacturer should be consulted because the optical parts of different manufacturer may not be interchangeable. A Bausch and Lomb CTA-10 conventional microscope would require these accessories: special condenser, telescope, filters, phase annulus, and objective totaling $344.00. A suitable microscope lamp may cost about $100.00. If a microscope is to be purchased especially for this work, consideration should be given to the American Optical N51MP Series 50 Phase Teaching Microscope with 4X scanning objective, 10X phase and 45X phase objectives, and built-in

illuminator. It appears to be a satisfactory instrument and sells for $448.00, without carrying case.

Examination of Molten Metal Marinite dust by phase contrast and by bright field illumination showed little difference since the fibers are stained brown - probably by iron oxide - due to heat treatment which Marinite receives to convert it to the Molten Metal type. This was confirmed by discussion with the Product Manager for Marinite, Johns-Manville Corporation, who stated that the only type of asbestos used in Molten Metal Marinite is the brownish amosite. At this time, it appears that exposures to Molten Metal Marinite fibers can be evaluated by bright field counting with a conventional microscope. Therefore, this can be used to get preliminary data on Marinite dust concentrations, until equipment for the standard method required by OSHA is obtained. This is not the case for other forms of asbestos, which will require phase contrast microscopy at the outset.

Sending samples to commercial laboratories for counting may be advantageous in some cases, but may also present difficulties in locating laboratories qualified to perform this service. Walter C. McCrone Associates, Inc., Chicago, Ill., is probably the best known organization in the field of consultative microscopy and is preparing to offer this service at a charge of $25.00 to $30.00 per sample.

Mr. Robert P. Carter has supplied a corrected list for the respirators approved by the Bureau of Mines to replace that attached to his December 23, 1971, letter re "Emergency Standard for Exposure to Asbestos Dust." A copy of this corrected list is Attachment #4.

If after reviewing this letter and all attached materials you have questions or special problems concerning methods of sampling and counting, please contact me.

GEORGE H. FARRAH

GHF:mh

Attachments

cc, no att: Chairmen, Environmental Health
Steering Committees
V. W. Rieke, Pgh. - 2
L. V. Cralley/T. B. Bonney, Pgh. - 7
W. B. Garyotis, Pgh. - 2
R. H. Watson, Pgh. - 7
R. B. Kempton, Rea Magnet

DISTRIBUTION:

	INDUSTRIAL HYGIENISTS	EHSC CHAIRMEN
Arkansas	J.L. Laudenberg	J.W. Wells
Badin	Earle Morgan	R.C. Hinkle
Chillicothe	J. Schachtele	J.J. Thimons
Cleveland	L.L. Grubb	L.J. O'Connell
Cressona	E.J. Schafer	N.O. Kraft
Corona	R.H. Allen	R.H. Allen
Davenport	K.W. Williams	D.L. Schaffer
Lafayette	L.S. Chambers	J.B. Dolan
Lancaster	H.E. Hillstrom	R.S. Howell
Lebanon	R. Andrew	R. Andrew
Logans Ferry	W.D. Helmick	J. Hicks
Marshall	J.W. Warnock	L.E. Norris
Massena	W.S. Barr	R.W. Knapp
Mobile	Albert Steele	R.V. Newsome
Pt. Comfort	C.F. Scott	C.L. Green
Richmond	R.E. Beachem	R.H. Cunneen
Rockdale	A.G. Clayton	G.W. Hutton
Tennessee	J.C. Vergho	H.W. Brooks
Tifton		H.E. Chandler
Vancouver	L.L. Haisch	P.F. Woodward
Vernon	H.E. Chandler	J. R. Jones
Warrick	R.L. Parsons	R.J. Knox
Wenatchee	J.A. Thompson	J.A. Thompson

regulated by this order than from other order plants during the month.

Proposal No. 9. Amend § 1036.42(b)(2) to read "Other source milk in bulk fluid form exclusive of that specified in § 1036.41(c)(6)".

Proposal No. 10. Amend § 1036.43 *Interplant movements.*

Add in § 1036.43(c)(3) (i), (ii), and (iii), the words "of bottling grade milk" after the phrase "constitute regular sources of supply".

Proposed by Borden, Inc.:

Proposal No. 11. Add to § 1036.45 a provision to read as follows:

Subtract from the remaining pounds of skim milk in Class II, the pounds of skim milk in other source milk (except that received in the form of a fluid milk product) that is added to, or used to produce, any product specified in § 1036.41 (b).

Proposed by Town and Country Dairy, Garvins Dairy, Sweet Home Dairy, and Halms Modern Dairy:

Proposal No. 12. Amend order No. 36 to provide that the following counties in the State of Ohio: Belmont, Jefferson, Harrison, Monroe, and part of Guernsey now in the marketing area; plus the West Virginia counties of Hancock, Brooke, Ohio, and Marshall be included in Zone 1 as defined by the proposal of Milk, Inc. (Proposal No. 1); or alternatively that the above dairies are to be put in the present Cleveland-Erie District rather than the Pittsburgh District.

Proposed by the Dairy Division, Consumer and Marketing Service:

Proposal No. 13. Revise § 1036.11(a)(1) to read as follows:

§ 1036.11 Pool plant.

* * * * *

(a) A distributing plant that has:

(1) Route disposition except filled milk, during the month of not less than 50 percent (40 percent for each month of April through August) of the total receipts of fluid milk products, except filled milk, that are approved by a duly constituted health authority for fluid consumption and that are physically received at such plant or diverted as producer milk pursuant to § 1036.16 to a supply plant qualified under paragraph (b) or (c) of this section or a nonpool plant; and

* * * * *

Proposal No. 14. Review the provisions of § 1036.11(c) to determine whether they should apply only to plants primarily engaged in the transfer of milk to distributing plants qualified under paragraph (a) of this section.

Proposal No. 15. Revise § 1036.30(a)(2) to read as follows:

§ 1036.30 Report of receipts and utilization.

* * * * *

(a) * * *

(2) Inventories at the beginning and end of the month of the following products:

(i) Fluid milk products; and

(ii) Products listed in § 1036.41(b)(1), except those received in packaged form from another plant, showing separately such inventories in bulk form and in packaged form;

* * * * *

Proposal No. 16. Revise § 1036.41(c)(6)(vii) to read as follows:

§ 1036.41 Classes of utilization.

* * * * *

(c) * * *

(6) * * *

(vii) Less 1.5 percent of the quantity of bulk fluid milk products and bulk cream transferred to other plants which does not exceed such quantity to which percentages are applied in subdivisions (i), (ii), (iv), (v) and (vi) of this subparagraph;

* * * * *

Proposal No. 17. Make whatever changes are necessary in the order to eliminate the possibility of a handler being charged under the order at the Class I price for milk that already has been classified and priced as Class I milk under a Federal order.

Proposal No. 18. Reposition, for clarification of the order, the provisions which establish that the Class I price for other source milk when adjusted for location of the shipping plant, shall not be less than the Class III price.

Proposal No. 19. Make whatever changes are necessary in the order to provide for a uniform "equivalent price" section to read as follows:

§ 1036.54 Equivalent price.

If for any reason a price or pricing component required for this part for computing class prices or for other purposes is not available in the manner described in this part, the market administrator shall use a price or pricing component determined by the Secretary to be equivalent to the price or pricing component that is required.

Proposal No. 20. Make such changes as may be necessary to make the entire marketing agreement and the order conform with any amendments thereto that may result from this hearing.

Copies of this notice of hearing and the order may be procured from the Market Administrator, 7503 Brookpark Road, Cleveland, OH 44129 or from the Hearing Clerk, Room 112-A, Administration Building, U.S. Department of Agriculture, Washington, D.C. 20250 or may be there inspected.

Signed at Washington, D.C., on January 7, 1972.

JOHN C. BLUM,
Deputy Administrator,
Regulatory Programs.

[FR Doc. 72-468 Filed 1-11-72;8:49 am]

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

[29 CFR Part 1910]

STANDARD FOR EXPOSURE TO ASBESTOS DUST

Notice of Proposed Rule Making

Section 6(c) of the Williams-Steiger Occupational Safety and Health Act of 1970 (84 Stat. 1596; 29 U.S.C. 655) provides that upon the publication of an emergency temporary standard in the FEDERAL REGISTER the Secretary of Labor shall commence a rule making proceeding in accordance with section 6(b) of the Act, and that the emergency standard as published shall also serve as a proposed rule for the proceeding. An emergency temporary standard concerning exposure to asbestos dust was published in the FEDERAL REGISTER on December 7, 1971 (36 F.R. 23207). Accordingly, pursuant to section 6 (b) and (c) of the Williams-Steiger Occupational Safety and Health Act of 1970 (84 Stat. 1593, 1596; 29 U.S.C. 655), 29 CFR 1910.4, and Secretary of Labor's Order No. 12-71 (36 F.R. 8754), it is hereby proposed to amend 29 CFR Part 1910 as set forth below. The proposals include the emergency temporary standard and additional proposed rules on subsidiary issues.

Interested persons are invited to submit, both orally and in writing, data, views, and arguments concerning these proposals.

Written data, views, and arguments may be mailed to the Office of Safety and Health Standards, Room 305, 400 First Street NW., Washington, DC 20210, within 30 days after the publication of this notice in the FEDERAL REGISTER. The data, views, and arguments will be available for public inspection and copying at the Office of Safety and Health Standards, except as to matters the disclosure of which is prohibited by law.

Oral data, views, and arguments will be received by Hearing Examiner Arthur Goldberg, at a hearing beginning at 10 a.m. on March 14, 1972, in Conference Room B, Departmental Auditorium, 14th Street and Constitution Avenue NW., Washington, DC. Persons desiring to appear at the hearing must file with the Office of Safety and Health Standards a notice of intention to appear, no later than March 3, 1972. The notice must state the name and address of the person to appear, the capacity in which he will appear, and the approximate amount of time required for his presentation. The notice must also include, or be accompanied by, a statement of the position to be taken with regard to the proposed rules.

The oral proceedings shall be reported verbatim, and transcripts shall be available for inspection to any interested person on such conditions as the presiding

hearing examiner may prescribe. The hearing examiner shall regulate the course of the oral proceedings, dispose of procedural requests, objections, and similar matters, regulate the conduct of those present at the hearing by appropriate means, and shall exclude to the extent practicable irrelevant, immaterial, and unduly repetitious data or arguments. The hearing examiner shall have discretion to keep the record of the hearing open for a reasonable, stated time to receive written recommendations, and additional data, views, and arguments from any person who has participated in the oral proceeding. Upon completion of the oral proceedings, the transcript thereof, together with written submissions on the proposed rules, exhibits filed during the hearing, and any posthearing data, views, arguments, and recommendations shall be certified by the hearing examiner to the Assistant Secretary of Labor for Occupational Safety and Health for his decision. The Assistant Secretary may adopt the proposals with or without changes, or determine not to issue a rule.

Under the authority of section 6(b)(1) and section 7(b) of the Act, the Assistant Secretary of Labor for Occupational Safety and Health will request the recommendations of an advisory committee with regard to the proposed rules. The committee will be provided with copies of these proposals, together with all pertinent factual information which is, or may become, available to the Assistant Secretary, including any information submitted by the National Institute for Occupational Safety and Health. The advisory committee will be asked to submit to the Assistant Secretary written recommendations regarding these proposed rules within 45 days after the publication of this notice. The recommendations will be available for public inspection and copying. No other advisory committee will be consulted with regard to these proposed rules.

Part 1910 of Title 29 of the Code of Federal Regulations is proposed to be amended as follows:

§ 1910.93 [Amended]

1. Table G-3 in § 1910.93 (36 F.R. 15104, August 13, 1971) is proposed to be amended by deleting the following:

Asbestos—12 fibers per milliliter greater than 5 microns in length or * * * 2 Mppcf.

Tremolite * * * 5 Mppcf. $\frac{20\ mg./M^3}{\%SiO_2}$

If so amended, Table G-3 would read as follows:

TABLE G-3—MINERAL DUSTS

Substance	Mppcf	Mg/M³
Silica:		
Crystalline:		
Quartz (respirable)	250 [1]	10mg/M³ [=]
		%SiO₂+2
Quartz (total dust)		%SiO₂+2 / 30mg/M³
		%SiO₂+2

Cristobalite: Use ½ the value calculated from the count or mass formulae for quartz.
Tridymite: Use ½ the value calculated from the formulae for quartz.

Substance	Mppcf	Mg/M³
Amorphous, including natural diatomaceous earth	20	80mg/M³
		%SiO₂
Silicates (less than 1% crystalline silica):		
Mica	20	
Soapstone	20	
Talc	20	
Portland cement	50	
Graphite (natural)	15	
Coal dust (respirable fraction less than 5% SiO₂)		2.4mg/M³ or
For more than 5% SiO₂		10mg/M³
		%SiO₂+2
Inert or Nuisance Dust:		
Respirable fraction	15	5mg/M³
Total dust	50	15mg/M³

NOTE: Conversion factors—
mppcf×35.3=million particles per cubic meter
=particles per c.c.

[1] Millions of particles per cubic foot of air, based on impinger samples counted by light-field technics.

[2] The percentage of crystalline silica in the formula is the amount determined from air-borne samples, except in those instances in which other methods have been shown to be applicable.

[3] As determined by the membrane filter method at 430 × phase contrast magnification.

[=] Both concentration and percent quartz for the application of this limit are to be determined from the fraction passing a size-selector with the following characteristics:

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

The measurements under this note refer to the use of an AEC instrument. If the respirable fraction of coal dust is determined with a MRE the figure corresponding to that of 2.4 Mg/M³ in the table for coal dust is 4.5 Mg/M³.

2. A new § 1910.93a is proposed to be added to Part 1910, reading as follows:

§ 1910.93a Asbestos dust.

(a) *8-hour time-weighted average.* The 8-hour time-weighted average airborne concentration of asbestos dust to which employees are exposed shall not exceed 5 fibers longer than 5 microns per milliliter, as determined by the membrane filter method at 400–450 × (magnification) (4 millimeter objective) phase contrast illumination. Concentrations above 5 fibers per milliliter, but not to exceed 10 fibers per milliliter, may be permitted up to a total of 15 minutes in an hour, but for not more than 5 hours in an 8-hour day.

(b) *Methods of compliance*—(1) *Engineering methods.* Engineering methods, such as, but not limited to, enclosure, vacuum sweeping, and local exhaust ventilation, shall be used to meet the exposure limits prescribed in paragraph (a) of this section. Where such engineering methods are not feasible, or do not reduce the concentrations below the limits prescribed in paragraph (a) of this section, respiratory protective devices shall be provided and used in accordance with subparagraph (2) of this paragraph.

(2) *Other methods.* (i) When the limits of exposure to asbestos dust prescribed in paragraph (a) of this section are exceeded, and engineering controls required by subparagraph (1) of this paragraph are not feasible or do not reduce the concentration of asbestos dust below the limits prescribed in paragraph (a) of this section, the employer shall require the use of respiratory protective devices. The selection of respiratory protective devices shall be limited to those specified in paragraph (c) of this section.

(ii) The employer shall require that each employee test his respiratory protective device before each use in order to insure a proper fit according to the manufacturer's instructions. The employer shall further provide for effective training or supervision of employees in the testing of respiratory protective devices for fit before their use.

(c) *Allowable respirators.* (1) When the 8-hour time-weighted average concentration of asbestos dust is projected to exceed 5 fibers longer than 5 microns per milliliter, but not to exceed 25 such fibers, and when a concentration over a period of 15 minutes exceeds 10 fibers longer than 5 microns per milliliter, but does not exceed 50 such fibers, a reusable or single use filter type respirator, operating with negative pressure during the inhalation phase of breathing, approved by the U.S. Bureau of Mines under the provisions of 30 CFR Part 14 (Bureau of Mines Schedule 21B), shall be used.

(2) When the 8-hour time-weighted average concentration of asbestos dust is projected to exceed 25 fibers longer than 5 microns per milliliter but not to exceed 250 such fibers, and when a concentration over a period of 15 minutes exceeds 50 fibers longer than 5 microns per milliliter but does not exceed 500 such fibers, a powered filter positive pressure respirator approved by the U.S. Bureau of Mines under the provisions of 30 CFR Part 14 (Bureau of Mines Schedule 21B) shall be used.

(3) When the 8-hour time-weighted average concentration of asbestos dust is projected to exceed 250 fibers longer than 5 microns per milliliter a type "C" positive pressure supplied-air respirator approved by the U.S. Bureau of Mines under the provisions of 30 CFR Part 12 (Bureau of Mines Schedule 19B) shall be used.

(4) The employer shall establish a respirator program in accordance with the requirements of American National Standard Practice for Respiratory Protection Z88.2—1969.

(5) The respirators provided each employee shall be properly inspected, cleaned, repaired, and stored.

(d) *Particular operations and products.* (1) When an employer has employees who are exposed to asbestos dust resulting from the operations or the use of tools described in the remaining subparagraphs of this paragraph (d), the employer shall comply with the requirements of this paragraph. The requirements of this paragraph shall apply at all times, and, in addition, the requirements of paragraph (b) of this section may also apply, according to the terms thereof.

(2) All hand- or power-operated tools which produce asbestos dust such as, but not limited to, saws, scorers, abrasive

wheels, and drills, shall be provided with local exhaust ventilation and dust collectors in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems; ANSI Z9.2—1971.

(3) Employees exposed to the spraying of asbestos, to the demolition of pipes, structures, or equipment covered or insulated with asbestos, or to the demolition of insulating strippings, shall be provided with respiratory protective devices in accordance with paragraph (c)(3) of this section.

(4) Asbestos cement, mortar, coatings, grout, and plaster shall be mixed in closed bags or other closed containers.

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

(6) Accumulation of asbestos dust shall be removed, as soon as practicable, and only by vacuum cleaners.

(e) *Warning signs*—(1) *Posting.* Warning signs shall be provided and displayed at each location where asbestos dust hazards are present. Signs shall be posted at least 50 feet in each direction from the location where the hazard is present, and at intervals of not more than 100 feet along each edge of the area where the hazard is present.

(2) *Sign specifications.* The warning signs shall conform to the requirements for 20" x 14" vertical format signs specified in § 1910.145(d)(2), and to this paragraph. The signs shall display the following legend in the white panel, with letter sizes and styles of a visibility at least equal to that specified in the notation in the following column to the right:

Legend:	Notation
Asbestos	1" Sans Serif Gothic or Block.
Dust Hazard	¾" Sans Serif Gothic or Block.
Follow these	¼" Gothic
Safety and Health Rules.	¾ Sans Serif Gothic or Block
1. Avoid breathing dust.	¼" Gothic
2. Wear your respirator.	¼" Gothic
3. Do not remain in area unless your work requires it.	¼" Gothic
Asbestos dust may cause asbestosis, a severe lung disease, and is implicated in the development of certain cancers. Control of exposure to asbestos dust helps protect against these hazards.	14 point Gothic.

(3) *Spacing.* Spacing between lines shall be at least equal to the height of the upper of any two lines, except that the spacing between "Following these" and "Safety and Health Rules" shall be at least ¾".

(f) *Monitoring*—(1) *Personal.* Employees engaged in the particular operations or using the particular tools specified in paragraph (d) of this section, or exposed to concentrations of asbestos dust in excess of the limits specified in paragraph (c)(3) of this section shall be monitored in accordance with this paragraph.

(i) *Method.* Dust samples shall be collected from within the normal breathing zone of the employees in their normal working posture. Employees wearing respiratory protective devices shall have the sample taken from a point located on the exterior of the respirator facepiece.

(ii) *Procedure.* The sampling procedure shall be such as to permit the determinations required by paragraph (a) of this section.

(iii) *Sampling duration.* The sampling duration shall be for a period of not less than 15 consecutive minutes.

(iv) *Sampling frequency.* Sampling periods shall be of such number and pattern as to represent accurately the exposure of the employees over their working period.

(2) *Environmental.* Environmental monitoring shall be conducted in all areas in which employees are exposed to concentrations of asbestos dust in excess of the limits specified in paragraph (a) of this section.

(i) *Method.* Asbestos dust samples shall be collected from areas which are representative of the concentration of airborne asbestos dust which may reach the breathing zone of exposed employees.

(ii) *Procedure.* Sampling procedure shall be such as to permit the determinations required by paragraph (a) of this section.

(iii) *Sampling duration.* Sampling duration shall be for a period of not less than 15 consecutive minutes.

(iv) *Sampling frequency.* Sampling periods shall be of such number and pattern as to represent accurately the exposure of the employees over their working period.

(g) *Medical examinations.* The employer shall provide, or make available at his cost, appropriate medical examinations on a periodic basis to any employee who is exposed to asbestos dust in excess of the limits specified in paragraph (a) of this section.

(h) *Records.* (1) Every employer shall maintain records of the personal and environmental monitoring, and of the medical examinations, required by paragraphs (f) and (g) of this section. Such records shall be maintained for at least 20 years.

(2) The records of monitoring shall be made available for inspection and copying to the Secretary of Labor and to his designated representatives.

(3) The records of medical examinations shall be made available only to the Secretary of Labor, to the Secretary of Health, Education and Welfare, to designated representatives of either of them, and, at the request of the employee or former employee examined, to his physician.

3. A new § 1910.19 is proposed to be added to Subpart B, reading as follows:

§ 1910.19 Asbestos dust.

Section 1910.93a shall apply to the exposure of every employee to asbestos dust in every employment and place of employment covered by § 1910.12, 1910.13, 1910.14, 1910.15, or 1910.16 of this Subpart B, in lieu of any different standard on exposure to asbestos dust which would otherwise be applicable by virtue of any of those sections.

(Sec. 6, 84 Stat. 1593, 29 U.S.C. 655, 29 CFR 1910.4; Secretary of Labor's Order No. 12-71, 36 F.R. 8754)

Signed at Washington, D.C., this 6th day of January 1972.

G. C. GUENTHER,
Assistant Secretary of Labor.

[FR Doc. 72-402 Filed 1-11-72;8:45 am]

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Food and Drug Administration

[21 CFR Part 19]

CERTAIN CHEESES

Proposed Identity Standards Regarding Labeling Requirements

Notice is given that a petition has been filed by the National Cheese Institute, Inc., 110 North Franklin Street, Chicago, Ill. 60606, proposing that identity standards for certain specified cheeses be amended to require that (1) the full name of the food appear on the principal display panel of the label in type of uniform size, style and color, (2) wherever any word or statement emphasizing the name of any ingredient appears on the label (other than in circumstances described below) so conspicuously as to be easily seen under customary conditions of purchase, the full name of the food immediately and conspicuously precedes or follows such word or statement in type of at least the same size as the type of such word or statement, and (3) optional ingredients be listed conspicuously, either on the principal display panel of the label or on a single appropriate information panel, in accordance with specifications that are consistent with similar specifications for many other food products.

Accordingly, it is proposed that Part 19 be amended:

1. In § 19.750(f) by revising subparagraph (6) and adding subparagraphs (7) and (8), as follows:

§ 19.750 Pasteurized process cheese; identity; label statement of optional ingredients.

* * * * * * *

(f) * * *

(6) The full name of the food shall appear on the principal display panel of the label in type of uniform size, style, and color.

(7) Wherever any word or statement emphasizing the name of any ingredient appears on the label (other than as specified in subparagraph (8) of this paragraph) so conspicuously as to be easily seen under customary conditions of purchase, the full name of the food shall

The sample should be collected on a 37-millimeter Millipore type AA* filter mounted in an open-face filter holder. The holder should be fastened to the worker's lapel and air drawn through the filter by means of a battery-powered personal sampler pump similar to those approved by NIOSH under the provisions of 30 CFR 74. The filters are contained in plastic filter holders and are supported on pads which also aid in controlling the distribution of air through the filter. To yield a more uniform sample deposit, the filter-holder face-caps should be removed. Sampling flow rates from 1.0 liter per minute (lpm) up to the maximum flow rate of the personal sampler pump (usually not over 2.5 lpm) and sampling time from 15 minutes to eight hours are acceptable provided the following restraints are considered:

(a) In order to obtain an accurate estimate of the number of fibers the statistical error resulting from the random distribution of the fibers must be kept to an acceptably low level. Since fiber counts follow a Poisson distribution, a count of 100 fibers in a sample would have a standard deviation of $\sqrt{100}$ or 10 fibers or $\pm$ 10%. Thus the 95% confidence limits would be approximately 2 standard deviations or $\pm$ 20%. Since the 37 mm filter has an effective collecting area of 855 mm^2 and the projected field area of the Porton reticle is 0.005 mm^2, each field represents 1/171000 of the sample. Based on this ratio the following number of fields must be counted to measure the various limits in various sampling times:

*Mention of commercial products does not constitute endorsement by the Public Health Service or U. S. Department of Health, Education and Welfare.

Sampling Time Minutes	Flow Rate lpm	Number of Fields for 100 Fibers		
		0.2 fibers/ml	2.0 fibers/ml	10 fibers/ml
10	2	4350	435	91
15	2	2860	286	58
30	2	1430	143	29
90	1	1000	100	20
90	2	500	50	10
240	1	260	26	7
240	2	180	18	4
480	1	180	18	4

(b) Do not count a field containing over 20 fibers because in addition to the fibers being counted, there are also present a number of grains, which interfere with the accuracy of the count.

Based on these restraints, i.e., number of fields to be counted and maximum number of fibers per field, acceptable sampling parameters for the various limits are underlined in the above table.

The following conclusions may be drawn from this analysis:

(1) The short-term limit should be for a period of at least 15 minutes and preferably 30 minutes.

(2) The 2.0 fiber/cc limit may be evaluated over periods of from 90 to 480 minutes.

As many fields as required to yield at least 100 fibers should be counted. In general the minimum number of fields should be 20 and the maximum 100.

Mounting Sample

The mounting medium used in this method is prepared by dissolving 0.05 g of membrane filter per ml of 1:1 solution of dimethyl phthalate

and diethyl oxalate. The index of refraction of the medium thus prepared is ND = 1.47.

To prepare a sample for microscopic examination, a drop of the mounting medium is placed on a freshly cleaned, standard (25 mm X 75 mm), microscopic slide. A wedge-shaped piece with arc length of about 1 cm is excised from the filter with a scalpel and forceps and placed dust-side-up on the drop of mounting solution. A No. 1-1/2 coverslip, carefully cleaned with lens tissue, is placed over the filter wedge. Slight pressure on the coverslip achieves contact between it and the mounting medium. The sample may be examined as soon as the mount is transparent. The optical homogeneity of the resulting mount is nearly perfect, with only a slight background granularity under phase contrast, which disappears within one day. The sample should be counted within two days after mounting.

Evaluation

The filter samples mounted in the manner previously described are evaluated in terms of the concentration of asbestos fibers greater than 5 um in length. A microscope equipped with phase-contrast optics and a 4-mm "high-dry" achromatic objective is suitable for this determination. 10X eyepieces, one of which contains a Porton or other suitable reticle at the level of the field-limiting diaphragm, should be used. The left half of the Porton reticle field serves to define the counting area of the field. Twenty fields located at random on the sample are counted and total asbestos fibers longer than 5 um are recorded. Any particle having an aspect ratio of three or greater is considered a fiber.

The following formulae are used to determine the number of fibers/ml:

$$(1)\quad \frac{\text{Filter area } (mm^2)}{\text{Field area } (mm^2)} = K$$

$$(2)\quad \frac{\text{Average net count} \times K}{\text{Air volume sampled (ml)}} = \text{fibers/ml}$$

For example, assume the following: area of the filter used was 855 mm^2, counting area of one field under the Porton reticle was 0.005 mm^2; average net count per field of 20 fields was 10 fibers; and sample was collected at 2 liters per minute for 90 minutes: Then:

$$\frac{855 mm^2}{0.005\ mm^2} = 171{,}000\ (K)$$

$$\frac{10 \text{ fibers} \times 171{,}000}{2{,}000 \text{ ml/min} \times 90 \text{ min}} = 9.5 \text{ fibers/ml}$$

Calibration of Personal Sampler

The accuracy of an analysis can be no greater than the accuracy of the volume of air which is measured. Therefore, the accurate calibration of a sampling device is essential to the correct interpretation of an instrument's indication. The frequency of calibration is somewhat dependent on the use, care, and handling to which the pump is subjected. Pumps should be calibrated if they have been subjected to misuse or if they have just been repaired or received from a manufacturer. If hard usage is given the instrument, more frequent calibration may be necessary.

Ordinarily, pumps should be calibrated in the laboratory both before they are used in the field and after they have been used to collect a large number of field samples. The accuracy of calibration is dependent on the type of instrument used as a reference. The choice of calibration instrument will depend largely upon where the calibration is to be performed. For laboratory testing, a 1-liter burette or wet-test meter should be used. In the field, a rotameter is the most convenient

instrument used. The actual set-up will be the same for all of these instruments. The calibration instrument will be connected in sequence to the filter unit which will be followed by the personal sampler pump. In this way, the calibration instrument will be at atmospheric pressure. Connections between units can be made using the same type of tubing used in the personal sampling unit. Each pump must be calibrated separately for each type of filter used, if, for example, it has been decided to use a filter with a different pore size. The burette should be set up so that the flow is toward the narrow end of the unit.

Care must be exercised in the assembly procedure to insure adequate seals at the joints and that the length of connecting tubing be kept at a minimum. Calibration should be done under the same conditions of pressure, temperature and density as will be encountered. The rotameter should be used only in the field as a check if the diaphragm or piston pumps are not equipped with pulsation dampeners. The pulsating flow resulting from these type pumps causes the rotameter to give results which are not as accurate as that obtained with a burette or wet-test meter. Calibration can be accomplished with any of the other standard calibrating instruments, such as spirometer, Marriott's bottle, or dry-gas meter. The burette and wet-test meter were selected because of their accuracy, availability, and ease of operation.

Method based on a modification of the membrane filter method described by Edwards & Lynch "The Measurement of exposure to Airborne Mineral Fibers." Presented at the American Ind. Hyg. Conference, Denver 1969.

¶ 8330 OSHA SAMPLING DATA SHEETS FOR FIVE TOXIC SUBSTANCES RELEASED

Back references: ¶ 1071; 6647.93; 6647.93a.

The Occupational Safety and Health Administration has released sampling data sheets for the five toxic substances on which its "Target Health Hazards" program will focus. The data sheets cover sampling equipment and procedures for carbon monoxide, asbestos, crystalline silica, lead and its inorganic compounds (except lead arsenate), and raw cotton dust. Criteria for violations of employee exposure to excessive concentrations of each substance are also described.

The sampling data sheets are reproduced below.

OSHA SAMPLING DATA SHEET #2

Substance:

Asbestos.

Standard: 29 CFR 1910.93a(a) of December 7, 1971

8-hour time-weighted average*: 5 fibers per milliliter greater than 5 microns in length.

Excursion limit*: 10 fibers per milliliter, up to 15 minutes in an hour for up to 5 hours per 8-hour day.

*Unprotected or improperly protected worker exposures

Analytical Method:

Fibers counted at 400-450 magnification, using phase contrast illumination, with sample mounted in high-viscosity solution of membrane filter material.

Sampling Equipment:

Personal sampling pump plus Millipore type AA filter (37mm, 0.8 μ pore size). Face cap is removed and filter used open face during sampling. Sampling rate: 2 l/m.

Sample Size:

Minimum period of 15 minutes for evaluation of excursion limit. Several samples of up to 4 hours for evaluation of 8-hour average. Samples with a visible deposit may be too heavy to count. Compare with a clean filter. Heavy concentrations of visible dust in the air (100 to 500 fibers/ml) may require short sampling periods of only 5 minutes, or less.

Blanks:

With each batch of samples submit two filters which are subjected to exactly the same handling as for the samples except that no air is drawn through them. Label these as blanks.

Shipping:

The cassettes in which the samples are collected should be shipped in a suitable container, designed to prevent damage in transit.

Imminent Danger Situations:

Generally not applicable.

Serious Violation:

5.1 or more fibers per ml, greater than 5 μ in length, for an unprotected or improperly protected worker, for an 8-hour time-weighted average, except for certain proven excursions as noted in the emergency standard, which may raise the 8-hour time-weighted average to 5.8 fibers per ml.

Nonserious Violation:

Not applicable.

De Minimis Violation:

Not applicable.

Attachment #4

CORRECTED LIST

RESPIRATORS APPROVED BY THE U.S. BUREAU OF MINES UNDER SCHEDULE 21B

AO	R8100 with R100 filter R8156 with R156 filter R5056 and R6056 with R56 filters
Safeline	5550 with 5950 filter 5556 with 5956 filter 5241 with 5971 filter
MSA	96000 with 96042 filter (This identical filter available as Cat. No. 96077 package of 5 filters and Cat. No. 96106 package of 50 filters) 10-86431 with Type S filter

RESPIRATORS APPROVED BY THE U.S. BUREAU OF MINES UNDER SCHEDULE 19B

Willson	GA2H, GAHS, GAHW, TAHW, GA2, GA8, GAF and GAFW
Acme	4615-1, 4616-1, 4654, 4800, 4810 and 4860
MSA	"Lead-Foe (helmet)," and "Hyperflo"
Pulmosan	HA-99 and AL-180
AO	R6099
Scott	6380DP
Firewel	
U.S. Divers SurvivAir 9011-02	

ALCO