PLAINTIFF'S EXHIBIT K363

July 24, 1970

Dr. Jon L. Konzen
Medical Director
Owens-Corning Fiberglas Corporation
Toledo, Ohio 43601

Dear Dr. Konzen:

Presented herewith are two copies of our report covering the asbestos survey and ventilation study at the Berlin, New Jersey Plant. In accordance with your request, our recommendations resulting from this study are being forwarded with the report as a separate item.

This report contains the same basic information that was presented and discussed at our meeting at the Berlin Plant on July 10, and the recommendations have been changed very little as a result of that meeting.

If there are any questions concerning this study or the report, do not hesitate to contact us.

Very truly yours,

Geo D Clayton

George D. Clayton
President

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INDUSTRIAL HYGIENE AND VENTILATION SURVEY
OWENS-CORNING FIBERGLAS CORPORATION
BERLIN, NEW JERSEY

PROBLEM

An extensive asbestos sampling survey was conducted at the Berlin, New Jersey Plant of Owens-Corning Fiberglas Corporation to identify areas where men are being over-exposed to asbestos fibers, and to measure the intensity of asbestos inhalation to men in various job classifications. At the time of the survey an evaluation was made of the Flatware Finishing Line ventilation to assess its performance in controlling sources of asbestos in the workroom. This survey was conducted by Messrs. John E. Mutchler and Henry J. Muranko of George D. Clayton & Associates, Inc. during the week of June 8, 1970.

INTRODUCTION

The Berlin, New Jersey Plant of Owens-Corning Fiberglas Corporation produces an asbestos containing insulation material, Kaylo. The basic process consists of wet formulation, pouring, drying, sizing and packing, using various formulations and several different sizes and shapes of dried insulation material. Both chrysotile and amosite asbestos are used in the basic formulation, together with lime, silica, cement, diatomaceous earth, iron chromite, clay and reprocessed Kaylo dust.

Worker exposures were measured in the following plant areas:

- Raw Material Handling
- Batch Floor Operations
- No. 1 Pouring Line
- No. 2 Pouring Line
- Miscellaneous Service Jobs
- Semi-Molded Billet Finishing
- Integrated Finishing Line
- New Flatware Finishing Line
- Band Saw Operations
- Dowtherm Control Room

ASBESTOS INHALATION

Until recently the standard method of sampling asbestos in the workroom was based on the number of particles per unit volume (millions of particles per cubic foot) determined by standard impinger sampling and 100X lightfield microscopy. For several years the Threshold Limit Value (ACGIH) was set at 5 mppcf. In 1969 the Threshold Limits Committee changed the TLV to a tentative value of 12 asbestos fibers per ml for fibers greater than 5μ in length, as determined by phase contrast microscopy at 430X. In 1970 the Committee reduced the TLV to a tentative value of 5 fibers per ml on the same basis. The British Occupational Hygiene Society has adopted a standard for chrysotile of 2 fibers per ml for 50 years of exposure, 4 fibers per ml for 25 years of exposure, or 10 fibers per ml for 10 years of exposure. These standards are, in the opinion of the experts, the best that can be drawn from existing data. These data are not ideal and, of course, the standards are subject to review in the light of new evidence and improved methods of measurement.

Good industrial hygiene practice suggests controlling exposures below the maximum allowable level, rather than maintenance at the maximum. In this connection, it is appropriate to design current engineering controls for an expected air-borne concentration of 2 fibers per ml in view of the trend downward in the acceptable exposure level and in accordance with good engineering practice.

SAMPLING PROCEDURES

In line with the latest sampling developments, those specified by the Threshold Limit Value, air samples were collected on pre-weighed cellulose ester membrane filters by the use of Mine Safety Appliances personal samplers. Three types of samples were taken: breathing zone, general area, and equipment locations. Sampling rates were 1.8-2.0 liters per minute and sampling periods varied between 5 and 150 minutes, depending upon the expected dust loading. At the conclusion of a sampling period the filter heads were removed and carried to a laboratory area where the filters were carefully transferred to sealed containers for transport back to the laboratories of Clayton & Associates.

FIBER COUNTING PROCEDURE

The method of counting asbestos fibers was that used by the U.S. Public Health Service for the enumeration of asbestos dust on membrane filters. The description of this method by G. H. Edwards and J. R. Lynch appeared in Ann. Occup. Hyg., 11, 1-6 (1968).

After weighing, sections of the sample are mounted on standard microscope slides using a high viscosity solution of membrane filter material in a 1:1 mixture of diethyl oxalate and dimethyl phthalate to render the filter transparent. Since the mount is stable for 30 days, 35 mm color slides are taken as permanent records of representative areas of each filter.

The asbestos fibers which lie on the surface of the filter are counted with phase contrast microscopy (as specified by the tentative Threshold Limit Value) using 10 x eyepiece and a 40 x phase contrast objective.

In mounting the sample, the transition of the dust-supporting substrate from translucent solid membrane filter cellulose ester material to a transparent, optically homogeneous gel is very gentle. Clearing of the filter is slow, requiring about 15 minutes, and at no time does a meniscus sweep across the dust deposit. The filter slowly softens from below causing no redistribution of the fibers.

Ten fields selected at random on the sample are counted and total fibers, fibers from 0 to 5μ, fibers greater than 5μ, and fibers greater than 10μ are recorded. Any particle having an aspect ratio of 3 or greater is considered to be a fiber.

RESULTS OF SAMPLING SURVEY

Table 1 records the results from the 95 samples taken during the survey, and lists the concentrations in terms of total dust, milligrams per cubic meter, and asbestos fiber concentration, fibers per milliliter. Three fiber length categories are included: "greater than 5 microns," "greater than 10 microns" and "total."

Table 2 tabulates the exposure by job classifications for each job studied. The exposures are categorized by intensity with numbers 1, 2 and 3, for both asbestos concentration (fibers >5μ) and total dust concentration. The exposure intensity was obtained by averaging all breathing zone samples taken for a given job classification and comparing that average with the tentative Threshold Limit Values (ACGIH) for 1970 as follows:

Exposure Category	Average Concentration: Asbestos Fibers/ml (>5μ)	Average Concentration: Total Dust Mg/M^3
1	≤4.99	≤9.99
2	5.00-9.99	10.00-19.99
3	≥10.00	≥20.00

Although the numbers do not necessarily reflect time-weighted average exposures, they do offer a useful index of relative exposures for all job classifications.

NEW FLATWARE FINISHING LINE VENTILATION

DESCRIPTION

The new dust collection and local exhaust system at the flatware finishing line consists of a rather complex multi-branched series of exhaust ducts leading from the new finishing line conveyor operations upward to a central exhaust duct that exits through the roof and northward to a baghouse collector located near the main plant building. The new flatware line runs continuously during the day shift with the exception of three "break" periods at 10:00 A.M., 12:00 noon and 2:00 P.M. At these times, the system is shut down, the baghouse is shaken, and the "baghouse checker" inspects the inside of the baghouse for excessive dust accumulation.

This control concept and the present mode of operation results in a decreased air flow and increased static pressure (loss of suction) within the dust collection network as the fabric filters accumulate dust.

AIR FLOW VARIATION IN ROOF DUCT

On June 11 the static pressure and air flow rates were monitored in the 30" roof duct leading from the new flatware finishing line to the baghouse collector. A velometer, standard pitot tube, inclined gauge manometer and glass-stemmed thermometer were used for the measurements, conducted at a point about halfway between the roof exit and the collector. The results of these measurements are shown below:

Time		Static Pressure "W.C.	Duct Temp. °F	Avg. Velocity fpm	Flow Rate cfm
0925		-6.6			
0936		-6.6	80		
0943		-6.6	80		
0953		-6.5	80	3,870	19,002
1002	Shutdown				
1013	Startup	-8.4	79	4,074	20,003
1017		-8.2	80		
1022		-8.0	80		
1400		-6.0	86	3,762	18,471
1403	Shutdown		86		
1435	Startup	-8.8	86	4,128	20,268

As a result of these measurements, it may be seen that the air flow into the dust collector varies about 5-10% depending upon the degree of dust accumulation within the baghouse.

AIR FLOW VARIATION AT THE FINISHING LINE

On June 11 the static pressures were measured in six selected legs and the center line velocities were measured in four selected legs of the finishing line exhaust system prior to and following the noon break, during which the bag filters were cleaned. The results of those measurements are listed below in Table 3.

These measurements show that the variation in air flow rates is much greater at the finishing line than in the main duct leading to the baghouse collector. In some cases the duct velocity can drop below the accepted minimum dust carrying velocity of 3,500 fpm as a result of normal operations, prior to cleaning the dust filters.

OBSERVATIONS ON DUST CONTROL AT THE NEW FLATWARE LINE

1. At the flycutter operation the motor shaft protrudes through the housing with a 3/4" gap around the motor shaft. This results in a considerable amount of dust emitted through the opening by the centrifugal action of the rotating shaft.

2. At the flycutter exit position, a series of rubber deflecting baffles have been installed improperly, resulting in a 1/2" gap between the top of the flycutter housing and the top of the baffles which should serve to prevent dust particles being thrown outward by the rotating flycutter. As a result, a large amount of dust is being emitted to the workroom through this unnecessary opening.

3. At several conveyor line junctions, including that between the sanders, the underside exhaust hoods are improperly placed at the point where the conveyors reverse direction. As a result, dust which could be captured is carried along the conveyor and dumped onto the floor.

4. At several conveyor junctions, including the flycutter-sander and side and end trim positions, there is no underside exhaust for dust being carried along the conveyor, resulting in significant quantities of dust being dropped on the floor when the conveyor belt reverses direction.

5. At the slitter saw position, there is an unnecessarily large gap around the shaft which allows excess dust to be thrown outward by the saw's rotating action.

6. Following the slitter saw position a rotating brush has been installed to clean the moving flatware before it is packed. The brush is not pos'`ioned properly and the flatware product moves to 'he inal conveyor section with considerable dust on its upper surface. As a consequence, when the flatware products are pushed into the boxes by the packers, copious amounts of dust are entrained into the breathing zone of these men.

7. There is presently no exhaust ventilation at or near the packers on the new flatware line, although there is a clear need for such local exhaust ventilation.

8. At the feeder position a canopy hood with a face area of 16 square feet hangs above the conveyor approximately 14" above the conveyor belt. This hood is exhausted to a different collector than the other local exhaust hoods in the flatware ventilation network. The face velocities at this

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hood were measured twice; first with the nearby portable fan running and second, with the fan off. In the first case, the face velocity averaged 83 fpm with a total flow rate of 1,330 cfm. In the second case, the face velocity averaged 150 fpm with a total flow of 2,400 cfm. Both of these conditions represent unacceptable control for the dust entrained in the breathing zone of the feeder during his normal work operations. The canopy hood is a second choice of control for this application, but if used, a flow rate of 4,200 cfm would be required.

SAMPLING AT FLATWARE FINISHING LINE EQUIPMENT

Six samples were taken near the flycutter, sanders and slitter saw on the flatware line conveyor, to assess the significance of these unit operations as sources of dust in the workroom. The results are as follows:

	No. of Samples	Total Dust mg/M^3	Asbestos Fibers/ml <5μ
Flycutter Inlet	1	32.77	4.80
Flycutter Exit	2	23.47	1.15
Between Sanders	2	21.28	1.11
Slitter-saw	1	11.67	5.35

It may be concluded that efforts to lower the dust concentrations near the Flatware Line are not aided by the present state of operation for the above items.

This report prepared by: John E. Mutchler
John E. Mutchler
Chief, Engineering Services

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RECOMMENDATIONS
OWENS-CORNING FIBERGLAS CORPORATION
BERLIN, NEW JERSEY

1. A significant contribution to the over-all dust problem at the Berlin plant results from traffic, both pedestrian and lift-truck, in areas where large amounts of settled dust have accumulated, especially on the batch floor, near the pouring lines and the finishing lines. A greater amount of attention must be devoted to removing these accumulations of dust on a frequent basis, both with the mechanized sweeper and with local house-cleaning efforts, including wet methods or other dust suppression measures. A permanent, central vacuum cleaning system could undoubtedly be used to effect a cleaner, less dusty over-all condition.

2. A thorough study should be made of ways and methods of optimizing the production lay-out in terms of material flow patterns and automation of certain operations which presently generate significant quantities of dust, including the batch floor operations.

3. The assistant Batch Mixer's dumping station must be re-designed to incorporate adequate local ventilation.

4. The Strippers, Oilers and Strip Service Man on the pouring lines are receiving excessive exposure to asbestos and total dust, and steps must be taken immediately to reduce these exposures to an acceptable level. The extent to which ventilation should be used for control should be carefully studied as well as other techniques.

5. The Dryer Service Man should have his exposure documented, and if it is as high as presently estimated, he should be equipped with an enclosed, filtered air cabin for his lift-truck.

6. All Wrapper-Packers and Packers on the finishing lines (Carton Men on New Flatware Line) must be protected through local exhaust ventilation at their job stations.

7. The Integrated Finishing Line, when moved to its new location, must be equipped with adequate local ventilation to protect the Saw Operators and the Packing Service Man.

8. The dust control system at the band saws near the new Flatware Finishing Line must be thoroughly cleaned, repaired and maintained to provide suitable control of air-borne dust for the saw operators.

9. The problems outlined in the section "New Flatware Finishing Line Ventilation" should be corrected as soon as possible, since each of the enumerated problems is a rather easily corrected, but significant contributor to the dust contamination around the Flatware Finishing Line.

10. The canopy hood at the Feeder's work position on the Flatware Finishing Line should be removed and replaced with a properly designed slotted, lateral exhaust hood which will remove dust from the man's breathing zone.

The dust control system for the new Flatware Finishing Line, even though it is new, has design problems which will render its performance marginal even under the best conditions, and in our opinion will undoubtedly prove to be unacceptable after a period of normal use; it should therefore be re-designed.