



ASBESTOS DUST STUDY
HAVEG INDUSTRIES, INC.
Wilmington, Delaware

February 7, 1968

By
Safety & Health Services
Employers Insurance of Wausau

C-2 000311

Asbestos Dust Study

Haveg Industries, Inc.
Wilmington, Delaware

By

W. J. Uber (1)
R. J. Wahl (2)
&
C. J. Ehrhart (3)

This study was made at the request of Mr. W. U. Reibold, plant engineer, on February 7, 1968, to determine the exposure of employees to airborne concentration of asbestos dust produced in the Asbestos Treating Plant and in the Spiraloy Division, Building 35.

Summary of Results

Premeasurements of asbestos-in-air concentrations were made in the asbestos drying bin - unloading areas, and at a ventilated lathe operation in the Spiraloy Division. The maximum concentration found was 2.3 million particles per cubic foot of air (mppcf), which may be compared with the Threshold Limit Value (TLV) of 5 m.p.p.c.f.

Survey Method & Instrumentation

Airborne samples were collected in midget impinger flasks using a callabrated Mine Safety Appliances Co., Monitaire Pump to draw air through the flasks. Samples were taken in the breathing zone, over periods ranging from 15 to 25 minutes, to measure concentrations representative of those breathed by workers during performance of their normal duties. The collected samples were returned to our Industrial Hygiene Laboratory and counted by

-
- (1) Senior Industrial Hygiene Consultant, New York, New York
 - (2) Industrial Hygiene Consultant, New York, New York
 - (3) Senior Safety Consultant, Philadelphia, Pennsylvania

C-2 000312

the standard United States Public Health Service method, using light-field microscopic techniques.

Ventilation measurements were also made on the local exhaust systems in the asbestos drying room and the Spiraloy Division, to determine the effectiveness of the ventilation installed for dust control purposes.

Threshold Limit Value
for Asbestos (4)

The American Conference of Governmental Industrial Hygienist has adopted a TLV of 5 m.p.p.c.f. for asbestos. This value represents conditions under which it is believed that nearly all workers may be repeatedly exposed 8 hours per day, day after day, without adverse effects.

C-2 000?13

(4) Threshold Limit Values for 1967, American Conference of Governmental Industrial Hygienist, 1014 Broadway, Cincinnati, Ohio 45202

Results of Analysis

The atmospheric concentrations of asbestos dust measured in the plant are given in Table I.

Table I
Concentrations of Asbestos Dust

Sample Number	Location	Concentration, m.p.p.c.f.		Remarks
		Measured	TLV	
<u>Asbestos Treating Plant</u>				
1.	Vicinity of Asbestos Dryer	2.3	5	
2.	Asbestos Bin Unloading	3.5	5	A
<u>Spiraloy Division</u>				
3.	Turning Conductors	1.9	5	B

Remarks:

- A. One man, using respirator during his time in the bin.
- B. Newly fabricated exhaust hood on the lathe sampled.

Ventilation Measurements

Asbestos Treating Plant

Measurements of air discharged from the Pangborn dust collector showed an exhaust volume of 390 cubic feet per minute (cfm). A review of the design data showed that the exhaust fan should deliver 1780 cfm at 2105 revolutions per minute (rpm), although the measured fan speed was 1200 rpm's.

With the 1750 rpm motor providing power, it was evident the fan pulley should be smaller than the motor pulley if the fan speed is to be greater than the motor speed, as specified. The designed fan speed of 2105 rpm can be closely approached if the present fan and motor pulleys are reversed.

As an additional check on ventilation system performance, static suction measurements were made on the dirty and clean sides of the collector fabric, for comparison with the clean side design value of 5" of water. Initial measurements showed 0.84" suction on the dirty side, 2.10" on the clean side, after the discharge restriction was removed. After the fan belt drive was tightened, dirty side suction increased to 1.4" of water. This represented an improvement over the initial suction pressure, but can be improved further by increasing the exhaust fan's speed.

Since a useful index of performance of the fabric - type dust collector is the static suction pressure produced on the clean and dirty sides of the fabric, a manometer should be permanently mounted at the dust collector and connected to both sides of the fabric for easy determination of each of these pressures.

In order to check the buildup of material and the hopper, a sight glass should be provided. It may be necessary to also fit a blow-off nozzle on the sight glass to permit clearing it for viewing.

Spiralov Division

The local exhaust ventilation system has been revised to provide additional capacity. The effectiveness of the system is indicated by the velocities in the exhaust ducts, in which a minimum velocity of 3500 feet per minute (fpm) should be maintained to assure transport of material through the ducts, resulting in self-cleaning. Duct velocity measurements showed during this study range from 3500 to 3700 fpm, which is adequate.

The air inflow velocity on the fabricated exhaust hood with which one lathe has been equipped, was 175 fpm, compared with a minimum value of 100 - 150 fpm necessary for dust control. The effectiveness of the new hood was shown also by the low atmospheric concentration of asbestos dust (sample #3) as well as the improved housekeeping around the lathe. Hoods should also be provided for the other lathes and for the belt sander.

In order to minimize the return to the room of dust passing through the collector, the collector discharge should be directed out of doors.

Suggestions for Improved Control

The following suggestions resulted from evaluation of the results of the study:

1. The Pangborn dust collector capacity and exhaust system performance at the asbestos dryer should be brought up to design standards by exchanging the fan and motor pulleys to increase fan speeds.
2. A manometer or other gauge should be provided at the dust collector to permit reading the static suction on both the clean and dirty sides of the fabric collector, as a means of checking on exhaust ventilation system performance. If the clean side suction approximates the design value of 5" of water, and the pressure drop due to accumulation of dust on the fabric is in the normal range of 2-4" of water depending upon the shaking cycle, then the clean side suction should range between 1 and 3" of water indicating effective performance.
3. A sight glass should be provided in the dust collector hopper to permit visual

inspection and checking of the dust level in the hopper so that collective performance is not adversely affected by an excess of accumulation of dust in the hopper. An air blow-off connection for cleaning may be necessary.

4. Additional local exhaust hoods for the other lathes and belt sander in the Spiraloy Division should be provided.
5. The Spiraloy dust collector discharge should be directed out of doors to prevent recirculating dust which passes through the collector.
6. All sanding done with portable tools should be done in the Sanding Room, which is equipped with local exhaust ventilation, rather than outside the room where asbestos dust is dispersed into other work areas.

Conclusion

This study showed that the asbestos dust concentrations measured during this sampling periods were not excessive, but that some improvements in the exhaust ventilation systems should be made to assure the continuation of the effective dust control.