HEALTH HAZARD EVALUATION REPORT 72-41-13
HAZARD EVALUATION SERVICES BRANCH
DIVISION OF TECHNICAL SERVICES

Establishment: Dyna-Con Packaging Corporation
Hamilton, Ohio

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45202

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HEALTH HAZARD EVALUATION REPORT 72-41
DYNA-CON PACKAGING CORPORATION
HAMILTON, OHIO

JULY 1972

SUMMARY DETERMINATION

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 699(a)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The National Institute for Occupational Safety and Health (NIOSH) received such a request from an authorized representative of employees regarding exposures to sawdust at the Dyna-Con Packaging Corporation plant in Hamilton, Ohio.

Air samples were taken with a hi-volume sampler in the trimsaw and bandsaw areas of the plant on June 5, 1972. Total dust concentrations in these areas ranged from 22.8 to 89.2 milligrams per cubic meter of air (mg/M^3). These levels are in excess of the established standard of 15 mg/M^3 (Federal Register, Part II, §1910.93, Table G-3) promulgated by the U.S. Department of Labor. Recommendations have been made to the company to lower the dust levels in these areas of the plant to obviate the observed hazard to the approximate 10-12 affected employees. Additionally, sound levels were measured which exceeded the noise standards (Federal Register, Part II, §1910.95, Table G-16). Recommendations have been made to management to obviate the noise hazard for affected employees in the bandsaw and trimsaw areas of the plant.

Copies of this Summary Determination as well as the Full Report of the evaluation are available from the Hazard Evaluation Services Branch, NIOSH, 550 Main Street, Cincinnati, Ohio 45202. Copies of both have been sent to:

a) Dyna-Con Packaging Corporation plant, Hamilton, Ohio
b) Authorized Representative of Employees
c) U.S. Department of Labor - Region V

For purposes of informing "affected employees", the employer will either (1) "post" the Summary Determination in a prominent place near where affected employees work for a period of 30 days or (2) provide a copy of the determination to each affected employee.

I. INTRODUCTION

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 699(a)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

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II. BACKGROUND HAZARD INFORMATION

A. Standards

The occupational health standards promulgated by the U.S. Department of Labor applicable to the substances of this evaluation are as follows:

Nuisance or Inert Dust (Federal Register, Part II, Section 1910.93, Table G-3)

Respirable fraction	....	5.0 mg/M^3*
Total dust	....	15.0 mg/M^3

Noise (Federal Register, Part II, Section 1910.95, Table G-16)

Noise standard	....	See Table III

B. Toxic Effects

At the present time, separate standards for wood or paper dusts do not exist. Instead, these dusts are classified under a general category which is called inert or nuisance dust and for which a standard has been set. Inert dust is not a cause of the characteristic disabling lung diseases seen with exposures to more toxic dusts, but exposures to any type of dust should be kept to a minimum. Cases of cancer, dermatitis, and respiratory disease have been reported as occurring in wood working industries, but the etiological agents are not known for certain.

*Units of measurement: mg/M^3 - milligrams of dust per cubic meter of air.

Exposures to intense noises may lead to a loss in hearing which may be temporary or permanent. Loss of hearing will be noted by a measured shift in the hearing threshold. When recovery to normal hearing thresholds occurs, the shift is known as "temporary". When full recovery does not occur, the shift is known as "permanent". Not all persons are susceptible to hearing loss at the same noise level. Therefore, it is not possible to set up a simple relation between hearing loss and noise level. However, standards have been established to protect the majority of the people.

III. HEALTH HAZARD EVALUATION

A. Observational Survey

A health hazard evaluation survey of the trimsaw and bandsaw areas of the Dyna-Con Packaging Corporation plant was made on June 5, 1972, by NIOSH representative Melvin T. Okawa. The functions of the National Institute for Occupational Safety and Health and its relation to Section 20(a)(6) of the Occupational Safety and Health Act of 1970 was explained to the plant manager. The National Surveillance Network Part I questionnaire was filled out with Mr. assistance as part of the explanation of the purpose of the visit.

was present during the observational and environmental surveys. The employees' representative was contacted briefly but did not wish to take part in the surveys.

Dyna-Con is a producer of corrugated paper containers. One of the operations at the plant involves the cutting and trimming of corrugated "posts" and "dividers". The posts are cut to size on an automatic two-blade trimsaw. Approximately 4-5 workers are in attendance at this operation during a shift. Dividers are cut to size by workers operating bandsaws. One bandsaw is attached to a shaking device and two helpers are required while the other bandsaw operator needs only one helper.

The occupational health hazards were judged to be paper dust and noise. Respirators and ear protection were not worn by employees in this area of the plant.

B. Environmental Survey

A health hazard survey was made to determine exposures to paper dust and noise in the trimsaw and bandsaw areas of the plant. Exposure to dust was measured with a Staplex hi-volume air sampler set at breathing zone levels with a portable stand. Samples were collected for 15-30 minutes at a rate of 28-29 cubic feet of air per minute (which was converted later to cubic meters per minute). The laboratory weighed collecting filters were Millipore type with cross-sectional dimensions of 8 inches by 11 inches.

It has been determined that "substances" as presently defined in Section 20(a)(6) of the Act do not include physical agents. However, for completeness of our overall responsibilities for acknowledging any occupational hazards we encounter during the course of our evaluation in the worksite in question, noise levels are reported in this evaluation.

The standard for occupational noise exposure as published in the Federal Register, Part II, Section 1910.95, Table G-16 is shown in Table III. The standard is based on single readings of sound pressure level on the A-weighting network at slow response.

Sound pressure levels in the trimsaw and bandsaw areas of the plant were measured with a General Radio Company Type 1565-B sound level meter on the A-weighting network and slow response.

Results:

The hi-volume air samples were taken to NIOSH facilities in Cincinnati, Ohio. The filters were reweighed to determine the weight of the paper dust in milligrams. The weight of the dust was divided by the total volume of air sampled in cubic meters to derive a total dust concentration in milligrams per cubic meter of air (mg/M^3). The results of the air samples are contained in Table I. The total dust concentrations ranged from a low of 22.8 mg/M^3 to a high of 89.2 mg/M^3. These concentrations were well above the U.S. Department of Labor standard (Federal Register, Part II, Section 1910.93, Table G-3) of 15 mg/M^3 for total dust.

Sound level exposures of workers were derived by the method listed below. Each cut on a saw was timed and it was determined to be about one second in duration. The average number of pieces each operator cut was found to be between 4500 and 5500 per eight-hour shift. Therefore, the average exposure time of an operator to a certain noise level was calculated to be between 75-90 minutes per eight-hour shift. A sound level range for a cut on each type of saw was recorded and an average sound level was derived. Table II contains the average noise exposure of a worker and his duration of exposure per work shift. Table III contains permissible exposures at different noise levels as promulgated by the U.S. Department of Labor. The noise level exposure of the worker operating the bandsaw with the shaker was calculated to be higher than is permissible. Noise exposures of other workers in the sawing areas were below permissible levels.

Summary:

Dust levels in the trimsaw and bandsaw areas were in excess of the established standard. The dust levels were too high to provide a comfortable or healthful work environment and steps should be taken to lower the dust levels.

The noise level exposure of one bandsaw operator was too high; exposures under the present standard were not excessive for other employees in the area. The present noise standard may be lowered in the near future and it is therefore recommended that some type of hearing conservation program be instituted.

IV. RECOMMENDATIONS

1) Local exhaust ventilation with a dust collecting system should be installed on the trimsaw and both bandsaws.

2) Workers should wear approved dust respirators in the trimsaw and bandsaw areas until engineering controls can be installed.

3) Efforts should be made to reduce noise levels at the source in the sawing operations.

4) Bandsaw operators should be provided with ear protection and be required to wear them until it can be determined whether noise levels can be reduced by engineering methods.

5) An audiometric testing program should be instituted for employees in the sawing areas of the plant.

TABLE I. TOTAL DUST CONCENTRATIONS IN BREATHING ZONE AREA SAMPLES COLLECTED NEAR THE TRIMSAW AND BANDSAW OPERATIONS AT THE DYNA-CON PACKAGING CORPORATION PLANT

SAMPLE NO.	AREA/OCCUPATION	TOTAL DUST CONCENTRATION (MG/M^3)*
1	Trimsaw Packing	22.8
5	Trimsaw Packing	23.1
2	Trimsaw Loading	89.2
3	Trimsaw Loading	78.8
4	Trimsaw Loading	54.8
6	Bandsaw With Shaker	52.9

*Approximate milligrams of particulate per cubic meter of air.

TABLE II. WORKER NOISE LEVEL EXPOSURES AT THE SAWING OPERATIONS AT THE DYNA-CON PACKAGING CORPORATION PLANT

AREA/OCCUPATION	AVERAGE NOISE LEVEL (DBA)	EXPOSURE TIME PER DAY
Operator-bandsaw with shaker	105.5	75 minutes/8-hr. day
Helper-bandsaw with shaker	95.0	75 minutes/8-hr. day
Operator-bandsaw without shaker	98.5	75 minutes/8-hrs. day
Feeder-trimsaw	92.5	90 minutes/8 hr. day

TABLE III

PERMISSIBLE NOISE EXPOSURES*

Duration Per Day, Hours	Sound Level dBA Slow Response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115 Ceiling Value

*When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect on each. If the sum of the following fractions: C1/T1+C2/T2 +Cn/Tn exceeds unity, then, the mixed exposure should be considered to exceed the limit value. Cn indicates the total time of exposure at a specified noise level, and Tn indicates the total time of exposure permitted at that level.