

PRELIMINARY SURVEY REPORT:

Fiberboard Plant
Medford Corporation
Medford, Oregon

SURVEY CONDUCTED BY:
Vincent D. Mortimer, Jr.

DATE OF SURVEY:
November 19, 1981

REPORT WRITTEN BY:
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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Institute for Occupational Safety and Health
Division of Physical Sciences and Engineering
Engineering Control Technology Branch
Cincinnati, Ohio 45226

PURPOSE OF SURVEY:

To observe the processes involving adhesives, with emphasis on the method of application and the associated occupational health hazard controls.

EMPLOYER REPRESENTATIVES CONTACTED:

Mr. Matthew Reilly, MDF Plant Manager

STANDARD INDUSTRIAL CLASSIFICATION CODE OF PLANT:

None Specific for Fiberboard

General area - 24XX: Lumber and Wood Products

Related area - 2492: Particleboard

ABSTRACT

A preliminary survey of the fiberboard plant of Medford Corporation was conducted as part of a NIOSH study of occupational health hazard controls associated with the industrial use of adhesives. The production processes, especially those involving the urea/formaldehyde resin, were observed.

The resin formulation used by Medford Corporation may contribute significantly to maintaining the low ambient levels of formaldehyde. Engineering controls included control rooms for process operators, a canopy hood over the board cooling unit, and roof fans above the press.

Introduction

Industrial adhesives may involve agents, such as formaldehyde, organic solvents, and a variety of additives, which pose potential occupational health hazards. An appropriate implementation of control technology may prevent the overexposure of workers to these substances.

The Engineering Control Technology Branch of NIOSH is conducting a research study to document control methods associated with the industrial use of adhesives. The first phase of this project involves preliminary surveys to assess the application of control technology in conjunction with the use of adhesives in a number of industries. The information gathered will be used to focus future efforts on the industries which can benefit most from further study and to plan for a second, more detailed survey at those plants which are selected for in-depth study.

The primary contact was the fiberboard plant manager, Mr. Matthew Reilly. After a brief discussion of the scope and objectives of this study, he lead the walk-through tour of the production line.

Description of Facilities

The fiberboard plant was built by Medford Corporation approximately seven years ago. Some changes have been made to increase production speed, but no major building or ventilation modifications have been made in that period of time. The large, wood frame/wood siding structure is heated; however, the general workplace is not air-conditioned. The plant is one of two Medford Corporation production facilities on the northwest corner of Medford: an older plywood plant is less than a mile down the road towards town.

The layout of the plant is diagrammed in Figure 1. The equipment for making fiberboard requires considerable space. The main production section occupies approximately 10,000 square feet with a 40 foot ceiling height. The finishing, storing and shipping area covers about twice as much floor space. Offices, including the plant manager's, a small laboratory, and a break room are constructed along the east wall. The resin blending facility is enclosed on the southwest corner of the building.

Over 100 people are employed in this plant, spread over four shifts. About four-fifths of these are production workers. The production process is highly automated, so only about four workers are required each shift to actually make the fiberboard. The employees are not represented by a labor union.

Description of Processes

To make fiberboard, heat and pressure are applied to a thick layer of wood fibers and resin. After cooling, the panels are sanded and trimmed to the desired size.

The wood particles are first blended with the resin and wax. Then the mixture is conveyed to bins from which it is deposited in layers (two core layers between two face layers) on a conveyor belt.

Two preliminary press operation impart sufficient rigidity to the unformed boards to enable them to be individually placed in a loader. During the time the press is applying heat and pressure, the loader is being refilled, and the boards most recently discharged from the press are being passed through the cooling wheel. A blast of compressed air blows loose particles from the press at the end of the cycle.

The cooling wheel is like a paddle-wheel with the boards resembling fins. The boards are picked up on one side and passed through a 180° arc to the other side where they are mechanically unloaded and stacked.

Initially the boards are oversize and somewhat rough. Before being shipped, they are sanded, sized, and usually stored for some period of time. For all operations, the boards are either moved in stacks with forklift trucks or transported singly on mechanical conveyors.

Description of Controls

Local exhaust ventilation is used over the cooling wheel. A canopy hood covers the boards as they make a 180° pass over a supply of air from a plenum on the lower left side. The unit is also enclosed on the sides, and air is extracted into a plenum on the right side as well as through the top of the hood.

Four roof fans located above the press remove much of the heated air from the press, although there is not much air flow observable at floor level or on the platform which provides worker access to all points of the production line.

Control rooms have been built for the operators who control the press and the layering of wood fibers. Now only a few workers involved in maintenance and clean-up regularly work outside this booth. An air conditioner has been installed for cooling during hot weather. The unit is a small, central-air type model which does have the provision to draw air from outside the building. It was not operating on the day of the survey, and it is not known what effect, if any, air-conditioning would have on formaldehyde levels in the control room.

The area where the resin is pumped and blended into the wood fibers is ventilated by a 40,000 cubic-feet-per-minute exhaust fan. There is approximately 100,000 cfm of air pulled through the finish-shipping area and evacuated by the vacuum-cleaning fans of the sanding machine and the cut-up saw. No appreciable odor of formaldehyde was noticed in either location. The spray nozzles are cleaned by pressing a built-in rod through the orifice.

Although at this time, there is no acceptable substitute for urea/formaldehyde resin, the resins being used today are modified to reduce formaldehyde emissions. The U/F resin used by Medford Corporation are the "low fuming" type and include a wax which contains a scavenging agent to reduce the free formaldehyde in the board after pressing. The effectiveness of this resin modification can not be assessed without comparison data for resin not containing these additives. Workplace sampling data has been requested from the state of Oregon.

Other Factors Affecting Occupational Health

All workers are required to wear hardhats except while in certain specific areas, such as the enclosed control rooms and the break room. Hearing protectors and safety glasses are required for some jobs. Respirators are not mandatory for any worker, except when working above the press. Both a Norton 7500-30M half-face mask and supplied-air respirators are available, but rarely required.

The company provides workers' compensation insurance coverage through SAIF Corporation, which provides some inspection and monitoring services. Each employee is covered by a hospitalization plan, and each is given a pre-employment physical. The State of Oregon, through the Workers' Compensation Department, also monitors worker health and safety.

The duties of the full-time safety director and his assistant include fire safety as well as accident prevention. The workers meet monthly to discuss safety items and for the presentation of an award for the best safety suggestion for that month. All workers are responsible for keeping the workplace clean, which contributes to explosion prevention. The building is equipped with a sprinkler system for fire suppression.

Conclusions and Recommendations

If the wood products industry is selected for in-depth study, this plant should be considered a prime candidate for a detailed survey. The cooling wheel is well ventilated. Although pockets of air were encountered in which the formaldehyde odor was noticeable, the workplace concentrations of formaldehyde seemed to be quite low on the day of the survey. Sampling, which could be done without interfering with production, should include sites around, above and below the press and the cooling wheel, around stacks of boards in the storage area, and in the control rooms with the door closed and both with and without air conditioning. Accessibility to the fans and above the press could be a problem.

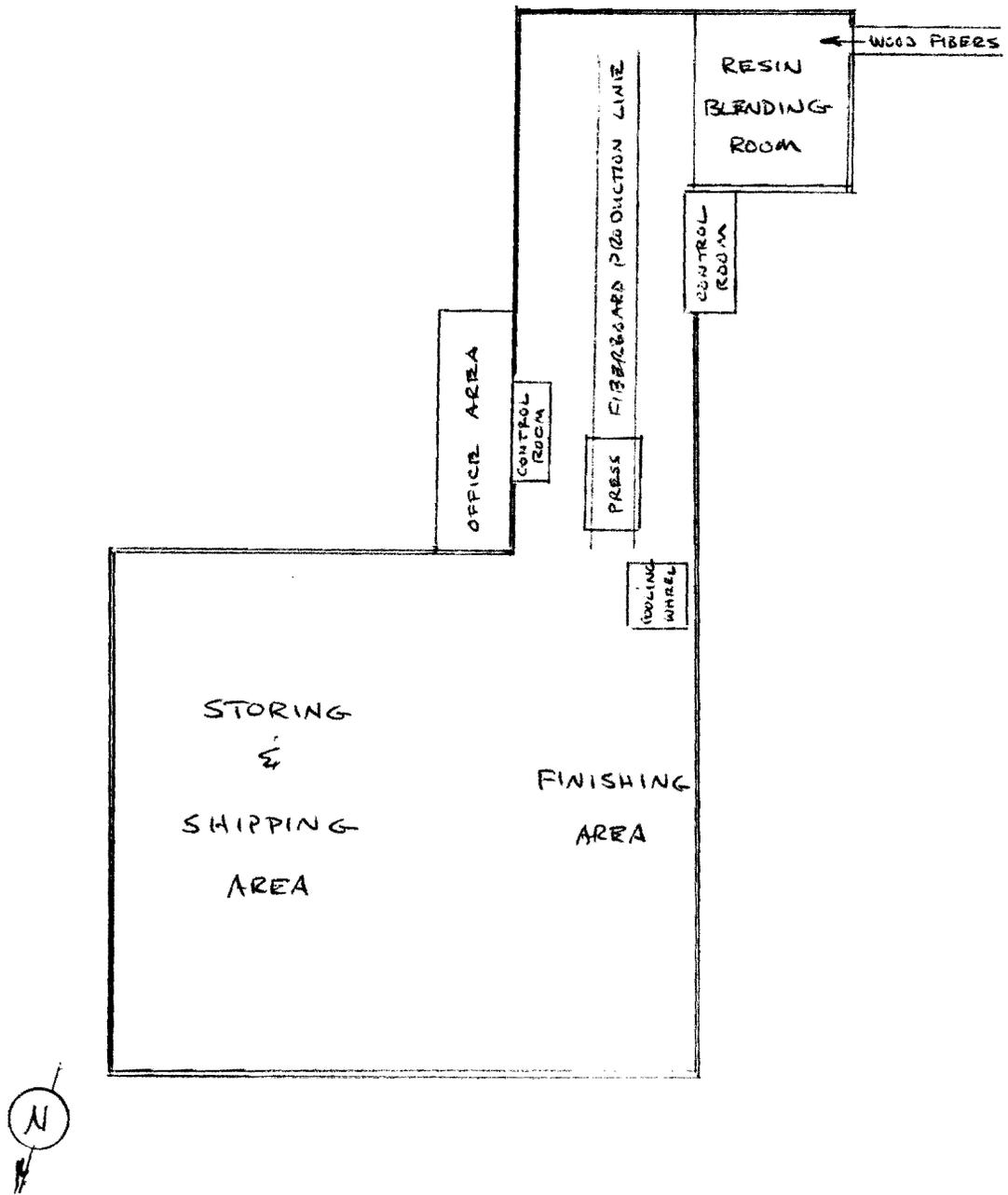


FIGURE 1. MEDFORD CORPORATION FIBERBOARD PLANT