



## Control of Wood Dust from Table Saws, Shapers, and Automated Routers

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## Hazard Controls

# Control of Wood Dust from Table Saws, Shapers, and Automated Routers

From the National Institute for Occupational Safety and Health

### Control of Wood Dust from Table Saws

#### Definition of Hazard

Table saws have been found to create significant amounts of wood dust. Workers exposed to wood dusts have experienced a variety of adverse health effects such as eye and skin irritation, allergy, reduced lung function, asthma, and nasal cancer. Therefore, the National Institute for Occupational Safety and Health (NIOSH) recommends limiting wood dust exposures to prevent these health problems.

#### Description of Controls

NIOSH researchers found that the wood dust generated by table saws is often poorly controlled. To address this problem, researchers designed and tested a control system for table saws that significantly reduced wood dust emissions.

**Local exhaust hood.** Table saws are widely used in many types of woodworking operations. Although they are sometimes used only sporadically, they are found to generate significant amounts of dust. The traditional method of dust control for table saws is exhaust through the bottom of the table. This is often not adequate to control the large amounts of high speed dust that are generated by the saw blade. To better control the dust, NIOSH researchers added a Local Exhaust Hood to the table saw (see Figure 1). Another modification involved the addition of a divider plate in the table base to increase the exhaust velocity and aid clean out. The table exhaust location was also relocated. The exhaust hood, when placed over the top of the blade saw, contains the dust as it is thrown from the saw blade.

Laboratory testing indicates that the exhaust hood reduces wood dust emissions by greater than 90 percent when it is installed on a typical table saw. The hood is designed so that it will not interfere with the operator's activities, is easy to install and maintain, and is inexpensive to operate. This dust control device is not currently commercially available. Call NIOSH for more information.

### Control of Wood Dust from Shapers

#### Definition of Hazard

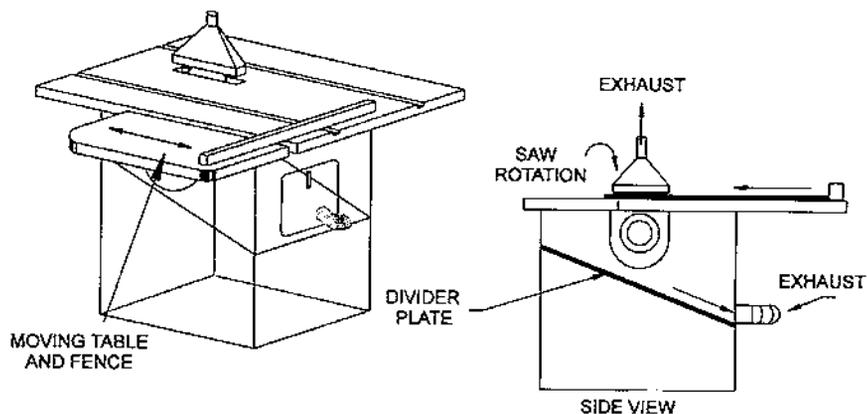
Wood shapers are a major source of wood dust emissions. Workers exposed to wood dusts have experienced a variety of adverse health effects such as eye and skin irritation, allergy, reduced lung function, asthma, and nasal cancer. Therefore, NIOSH recommends limiting wood dust exposures to prevent these health problems.

#### Description of Controls

Surveys by NIOSH researchers found that the dust from wood shapers tends to be poorly controlled. The amount of wood dust emitted was found to depend

on the sharpness of the cutter, the depth of the cut, the rate at which the wood is fed into the shaper, and the location of the exhaust hood. After studying the usual hood exhaust placement, researchers developed an improved hood configuration that significantly reduced wood dust emissions.

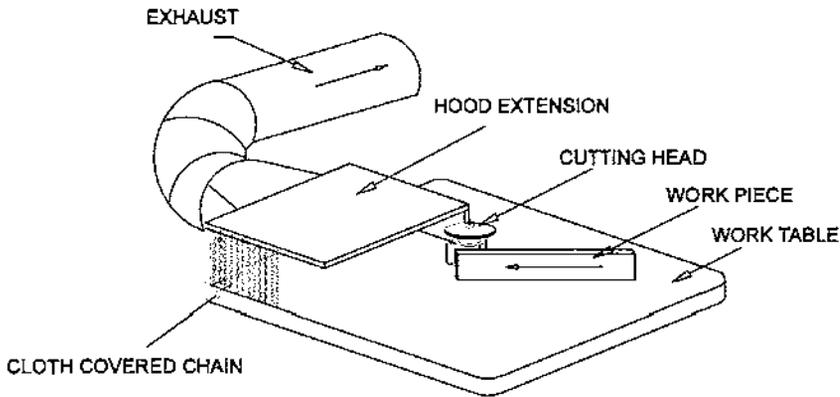
**Modified exhaust hood.** Wood shaper emissions are usually controlled by an exhaust hood located at the back edge of the work table which allows the operator to freely move the workpiece over the table. Placing the exhaust hood nearer the cutting head would maximize dust collection, however, this would restrict the operator's freedom to move the workpiece. To overcome this problem, a hood extension with a flexible face opening is added (see Figure 2). The flexible face opening consists of cloth-covered chains that allow the wood to pass through, but stops the wood dust particles. The extension also increases the hood face velocity by minimizing the open face area. This dust control device is not currently commercially available. Call NIOSH for more information.



Illustrator: Daniel S. Watkins

FIGURE 1

Auxiliary exhaust hood for table saws.



Illustrator: Daniel S. Watkins

**FIGURE 2**

View of wood shaper with hood extension.

### Control of Wood Dust from Automated Routers

#### Definition of Hazard

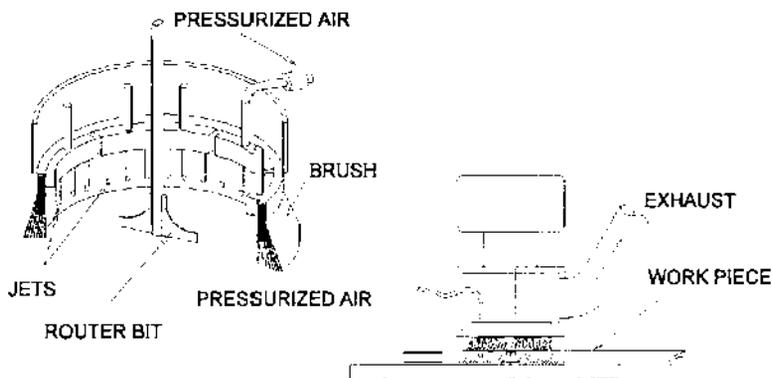
Automated routers have been found to create significant amounts of wood dust. Workers exposed to wood dusts have experienced a variety of adverse health effects such as eye and skin irritation, allergy, reduced lung function, asthma, and nasal cancer. Therefore, NIOSH recommends limiting wood dust exposures to prevent these health problems.

#### Description of Controls

NIOSH researchers found that the wood dust generated by automated routers is generally not adequately controlled. To address this problem, researchers designed and tested a new con-

trol system that substantially reduced dust emissions.

*Jet stripper system.* Automated routers, consisting of a moving router head and table, are capable of routing in any direction. These high speed machines generate substantial amounts of wood dust. Generally, the wood dust is controlled by a local exhaust system located at the router head. Despite this control, significant amounts of wood dust are emitted into the workroom. A computer controlled Jet Stripper System was developed to control these emissions (see Figure 3). This system consists of 24 jets combined into 8 operational units uniformly located around the inside periphery of the brush holder. The Jet Stripper and brush surround the router bit.



U.S. Patent 4986703\*

Illustrator: Daniel S. Watkins

**FIGURE 3**

Jet stripper system for automated routers.

The jets are supplied with pressurized air and are activated by pneumatic valves as needed. The air slows down the dust particles so they can be collected by the local exhaust hood. Testing shows that this system reduces wood dust emissions by 90 percent. The Jet Stripper does not interfere with the operator, requires minimal maintenance and is inexpensive to install and operate. This control can also be used with conventional, one-dimensional routers with some modification. This dust control device is not currently commercially available. Call NIOSH for more information.

### For More Information

To obtain more information about controlling these hazards, or for information on other occupational health and safety issues, call NIOSH at: 1-800-35-NIOSH (1-800-356-4674).

Technical articles, *Controlling Wood Dust from Table Saws*, *Dust Controls for Wood Shaper* (Appl. Ind. Hyg. J. 2[4]:164-169[1987]), and *Control of Wood Dust from Automated Routers* (App. Occup. Environ. Hyg. 5[7]:419-427 [1990]), have been published on these subjects. Also, a videotape *New Ventilation System for Automated Routers*, Tape #204, 5 minutes, may be borrowed free of charge.

These documents are three in a series of seven Hazard Controls concerning wood dust control techniques listed below that are available free upon request from NIOSH. Additional topics include:

- Control of Wood Dust from Shapers
- Control of Wood Dust from Automated Routers
- Control of Wood Dust from Table Saws

### Acknowledgments

The principal contributors to these Hazard Controls are Jennifer L. Topmiller, Division of Physical Sciences and Engineering, and Jerome P. Flesch, Education and Information Division, NIOSH.

These documents are DHHS (NIOSH) Publication Nos. 96-127 (table saws), 96-122 (shapers), and 96-123 (automated routers).