

Woodworking Safety Guide



UBI

A Division of AmTrust North America

IS YOUR SHOP SAFE?

There are more than 31,000 commercial wood working shops in the United States. This class of business includes wood furniture manufacturers, carpentry contractors, furniture restorers and refinishers, and cabinet/countertop manufacturers.

This brochure addresses some of the major hazards and controls encountered in woodworking stages of design, rough milling, finish cutting, assembly, finishing, shipping and delivery.

SERVICES BEYOND THE POLICY

Purchasing insurance from UBI is a wise choice. We provide more than a policy. We provide the support of UBI Loss Control Services, professionals whose reputation for technical proficiency is well known.

Our goal at Loss Control Services is to make your operations safer, more efficient and even more profitable.

Obviously, no loss-control service can guarantee zero employee injuries, a fireproof building, immunity from lawsuits or complete theft protection. Insurance is still the ultimate safeguard in an imperfect world, but loss control is an important component in preserving your resources.

EMPLOYEE SAFETY AND HEALTH

Hazards should be controlled through engineering or work-practice controls that eliminate or reduce employee exposure by changing the way a job is performed. Engineering controls typically involve machine guarding. Work-practice controls address operator training and instruction for machine use, maintenance, inspections, use of guards and tools. When these controls are not sufficient, personal protective equipment (PPE) should be provided as a supplement.

Woodworking operations are especially hazardous when machines are improperly used or do not have required safeguards. Recent statistics reveal that up to 20% of woodworkers are injured annually. The most common injuries are lacerations, amputations/severed fingers and blindness. During a recent four-year study by the National Institute for Occupational Safety and Health (NIOSH), almost 10,000 worldwide amputations were mostly attributed to radial arm saws and table saws. Injuries resulting from amputations are the most costly lost-time workers' compensation claims. These injuries averaged \$39,826 per workers' compensation claim filed in 2002 and 2003.

Machine Guarding

Machine guarding is a primary and effective engineering control for woodworking machinery hazards. Moving machine parts including the point of operation, the power transmission apparatus, and rotary or reciprocating parts must be safeguarded. Three commonly used guards are fixed / permanent, adjustable and self-adjusting that move according to stock sizes at the point of operation. Machine guards must be secure, and workers should not be able to easily bypass, remove or tamper with guards.

Typical work practice controls involve the use of push sticks rather than hands to guide short or narrow pieces of stock through saw blades.

Wood Dust and Chemical Hazards

Breathing airborne wood particles may cause allergic respiratory symptoms, mucosal and nonallergic respiratory symptoms and cancer. The respiratory effects of wood dust exposure include asthma, hypersensitivity pneumonitis and chronic bronchitis. Contact with the irritant compounds in wood sap can cause dermatitis and other allergic reactions. Wood dust and a number of chemicals used in woodworking processes present fire hazards. Chemicals are also noted for long-term adverse health effects, including elevated risks of liver cancer and brain tumors from carcinogens, heart and kidney disease, and respiratory illness and dermatitis.

Wood dust and chemical hazards can be mitigated by combining engineering and work practice controls that are supplemented as needed with proper personal protective equipment (PPE) such as facemasks and respirators, goggles, safety glasses, face shields and gloves.

An example of wood dust control involves placement of local exhaust ventilation systems close to the source of dust emissions. The systems can often be integrated with machine guards. They should have an efficient air cleaning device and should be properly maintained at regular intervals.

An industrial hygiene program should be established for periodic monitoring of wood dust and, where appropriate, chemical exposures. Employee use of respirators requires a written respiratory protection program that addresses selection, fit-testing, use, cleaning and maintenance of NIOSH-certified respirators, employee training and medical evaluations.

Emergency eyewash facilities and safety showers capable of providing at least a 15-minute flush of running water are required for battery-charging and chemical handling areas. A written hazard communication program must be implemented to ensure that employees are instructed and trained in chemical hazards.

NOISE LEVELS



Source controls for reducing excessive noise levels start with equipment analysis and identification of noises produced by motors, gears, belts and pulleys, and points of operation, such as where blades touch wood. Sound may also be transmitted by vibration or resonance from the frames, footings and housings of the equipment. Basic noise source controls are equipment maintenance and lubrication, and engineering controls of isolation, stabilization and damping.

Path controls for reducing noise intensity before it reaches the human ear involve• Segregating operations to limit the number of employees exposed

- Enclosing equipment within barriers designed to absorb or reflect noise
- Moving or locating noise-producing equipment away from employees

Hearing protection devices will likely be required given the nature of woodworking operations. They should be used as the final line of defense against excessive noise when engineering and work practice controls are not sufficient. Employers must implement an effective hearing conservation program when employee noise exposures are at or above an eight hour time-weighted average (TWA) of 85 dBa.

FIRE SAFETY

Construction

Buildings in which materials that produce combustible dusts are stored, handled or processed should be of single-story, noncombustible or fire-resistive construction. Beams, ledges, flat and wide ductwork, and other structural features where dust may settle should be limited.

Where operations are within a single structure, the heating plant, manufacturing, warehousing, dust storage, finishing area, chemical storage and spray application room must be arranged or designed to minimize fire and explosion potential. If possible, the areas should be separated from the facility or segregated by approved fire barriers or fire walls.

Fire Protection

Fire protection is a basic safety concern in woodworking operations. The high fire load of flammable and combustible materials and inherent ignition sources increase the probability of major fires and explosions. In addition, much of the loading may include plastic materials that, when ignited, generate dense toxic fumes that may further impede fire-fighting efforts.

The leading causes of fire are due to faulty or malfunctioning wiring and electrically operated equipment, ignition of wood dust, ignition of paints and solvents, and failure to observe smoking restrictions.

Effective fire protection controls require that dust collection equipment be placed outside the building but not on the roof. Automatic sprinkler protection should be provided for rooms containing indoor dust collection equipment posing fire and deflagration hazards. The sprinkler system should be monitored by a central station and inspected quarterly by an authorized sprinkler contractor.

A fire alarm system required for life safety should be installed, tested, and maintained in accordance with requirements of the National Fire Protection Association (NFPA) 72 National Fire Alarm Code, unless the building has less than 100 occupants. The system should be monitored by a central station alarm company with automatic re-transmission of fire alarm signals to the fire department.



IGNITION SOURCES

Electrical

Electrical systems should be rated for the projected use and protected by appropriate and labeled circuit breakers. Explosion-proof electrical equipment and switches and non-sparking tools should be used in areas of flammable spray application and storage and dispensing of flammable liquids. Fully enclosed dustproof electrical equipment is required for dust collection and wood processing activities where combustible dust is normally suspended in the air. Fully enclosed, dust-tight electrical equipment should be present in woodworking operations that produce moderate dust levels.

The wiring in the building and on the equipment should be inspected periodically for damage and fraying. Worn or torn insulation coverings and heat from defective or improperly installed wiring can ignite nearby flammable and combustible materials. Equipment prone to accumulating static electrical charges should be grounded. All machines must have a main power disconnect for lockout/tagout.

Maintenance

Effective maintenance involves keeping cutting tools sharp to reduce fires originating from saws, sanders and other milling equipment. Mechanical dust-conveying equipment, such as augers and conveyor belts, should be serviced regularly and properly lubricated to reduce the buildup of heat and excessive noise levels.

To ensure that all potential and existing power sources are shut off and locked out for machine maintenance, a written lockout/tagout plan should be developed for each machine. The plan should describe all power sources and the correct procedure for shutting down, testing and re-energizing equipment.

Smoking

Smoking should be prohibited. If smoking is permitted, designated smoking areas away from flammable and combustible material storage should be provided with non-combustible receptacles for smoking material disposal. "No Smoking" signs should be posted in all other areas of the facility.

FUEL SOURCES

Wood Dust

Woodworking facilities of all types and sizes share a common hazard of wood dust accumulation. The major key in fire prevention for woodworking facilities is dust removal. Machinery that produces dust should be properly fitted to a dust collection system. The type of collection system and safeguards required will depend largely on the volume of dust being generated and the size of the particles. A separator or cyclone system is used for handling coarse particles like chips and splinters from machines such as moulders, shapers or planers. A baghouse system or filter system handles fine dust from processes such as high-speed routing, especially of medium-density fiberboard (MDF). The dust collection ductwork should be galvanized metal, provided with explosion venting and be properly bonded and grounded.

Fire protection requirements for dust collectors and ductwork vary based on the type of equipment and severity of the hazard. The dust collection equipment may be protected by an automatic sprinkler system, as well as a number of other options including suppression systems, spark detection, abort gates, flame-quenching devices and explosion venting. The duct from the central collector to the storage bin should have a flashback prevention system to keep explosions from blowing back through the conveying ductwork into the building or into other equipment. Dust bins should have an audible or visual warning system with smoke, heat or light detectors that shut down the fuel and oxygen supply in event of a fire. When automatic sprinklers are used to protect a dust collector, the sprinkler system should be hydraulically designed to provide a minimum density of 0.20 gpm/ft². Housekeeping practices should include routine cleaning of beams, ceilings, spaces above equipment and all surfaces having dust layers over 1/8 in. Dust layers as small as 1/32 in. thick or the diameter of a paper clip wire can be sufficient to produce uniform dust clouds within the explosive range of most dusts. Vacuum systems with static-reducing devices should be used to pick up dust. Compressed air should never be used for dust blow-down, which creates an explosion hazard with formation of a combustible dust cloud. Engineering plans should be available to ensure conformity of the dust collection systems to National Fire Protection Association (NFPA) standards and ensure that the manufacturer's recommendations for maintenance are implemented.

Flammable and Combustible Materials

Flammable compounds used in finishing activities produce vapors with low flashpoints that ignite within known concentrations. Another source of fires is paint buildup from spills and overspray that can spontaneously ignite or ignite from sparks or other sources.

Spray booths must be constructed of noncombustible materials such as steel, concrete or masonry. Explosion-proof equipment, wiring and lighting, and mechanical ventilation that operate during spraying activities should be provided. Spray application of flammable and combustible materials requires an approved automatic extinguishing system that protects the spray booth or room and ventilation exhaust ducts. If automatic sprinkler protection is not provided due to inadequate water supply, then a dry chemical, CO₂, automatic foam, or clean-agent extinguishing system is acceptable. All sprinkler heads should be covered with cellophane or thin, paper bags to prevent accumulation of overspray.

Inside flammable liquid storage should not exceed 120 gallons of flammable or combustible liquids in any one approved cabinet. Not more than three approved cabinets may be present in the same storage area. Flammable and combustible liquids in excess of 360 gallons may be stored in a noncombustible, inside storage room with a minimum two-hour fire resistance rating. In addition to self-closing fire doors, the storage room should be protected by an automatic sprinkler system; spill-containment; explosion-proof electrical equipment; and ventilation equipment designed to maintain a change of air at least six times per hour.

Limit the use of flammable materials outside a storage cabinet or room to the amount required for a single day's work. Solvents and thinners with a flashpoint below 100° F should not be transferred between containers unless both containers are bonded and grounded. Keep flammable materials in covered containers when not in use.

Material Handling

Material handling is usually performed with forklifts and other powered industrial trucks. Careless handling of this equipment may result in property loss such as collision with fire doors or sprinkler piping, dropping loads or containers of flammable liquids. Fires can occur from fuel spills or may start with electrical short circuits or battery explosions during recharging of battery-operated trucks.

Only forklifts approved for the electrical classification of the area shall be operated and refueled by trained and certified employees. Battery-powered industrial trucks should be used. If this is not feasible, propane- or diesel-powered industrial trucks should be properly tuned-up or catalytic converters added to reduce carbon monoxide emissions. Battery-charging areas should have local exhaust ventilation and take place away from any ignition source.

GENERAL LIABILITY

Premises Safety

Liability exposures are reduced when no showrooms or retail areas are present. Slips and falls are the primary losses. Cuts, lacerations and/or dismemberment may result from accidental contact with sharp or moving parts on the equipment or automated machinery. Visitors to the woodworking area should wear required personal protective equipment (PPE) and follow the manufacturer's safety policies.

Good housekeeping practices, along with a scheduled maintenance program, are the best control measures. Aisles, stairways and walkways should be free of clutter and debris. Production areas should be swept or vacuumed daily. Signs should be posted restricting visitors from the production and other areas that are off-limits to non-employees.

Off-premises exposures of property damage and injuries exist for pickup and delivery activities of owned trucks while backing to loading docks and maneuvering vehicles in small spaces.

Life Safety and Emergency Preparedness

Employees should be informed of the hazards in their work area and a written Emergency Action Plan (EAP) that details the actions employees are to take in the event of an emergency should be established. Employees should be trained in the selection, location and use of portable fire extinguishers. Semi-annual evacuation drills should be conducted and clear escape and alternate escape routes from the building(s) established. The local fire department, hospital and health officials, utilities, and police must be informed about the location of chemicals in the building.

In addition to fire detection, alarm and communications systems, illuminated exit signs and emergency lighting units should be provided. Dust collectors should not be within 20 ft. of any means of egress.

Independent Contractors

Liability exposures arising from faulty workmanship and damage to others' premises exist with the use of independent contractors. Controls are selection of qualified and experienced contractors, contractual agreements, hold-harmless statements and certificates of insurance.

The contractors should be instructed in the manufacturer's safety policies, especially procedures in event of an accident. Contractors working in hazardous areas should wear required personal protective equipment (PPE) and follow the manufacturer's safety policies.

Written contract installer guidelines should address hiring and training of subcontract installers, job responsibilities, inspection procedures, recommended tool list, and inspection records required for each job. A bonus incentive can be established for obtaining the job supervisor's inspection and written approval of an installation.

PRODUCT LIABILITY

Product Quality and Safety

Product liability and completed operation claims may arise due to improper construction and use of poor lumber grade. Minor injuries such as splinters and cuts are common losses due to improperly finished products. Major injuries are less likely but could occur if the finished products cannot withstand certain weights. Another common claim arises out of ready-to-assemble (RTA) products/furniture. Instructions in packaging may be erroneous or may not be understandable or complete.

Quality control should include testing joints, panel construction, finished panels and sub-assemblies. If operations involve upholstering, the product should conform to the safety standards set forth by the Upholstered Furniture Action Council (UFAC). Only fabric coverings that have been treated with flame-resistant chemicals when woven or dyed should be used.

In addition to safe use instructions, product warnings that identify specific hazards and controls should be prominently displayed. Unassembled products should have a list of items in the package, a list of required tools for assembly, and safe procedures for product assembly and hazard warnings of improper assembly. The instructions should be tested with product users to verify that they can be accurately followed. Maintain records of the results of design reviews, product testing and inspection, equipment calibrations, and the location of products within the distribution chain. The records will assist in timely detection of safety hazards and trends, and in tracing products or product components. Product recall procedures should be established.

FLEET

Motor vehicle collisions continue to be the leading cause of occupational fatalities in this country. In the decade between 1992 and 2001, more than 13,000 workers died in motor vehicle collisions — accounting for 22% of all injury-related deaths. Even with an overall decrease in the number and rates of occupational fatalities from all causes, the annual number of work-related roadway deaths has increased to a rate of 1.2 deaths per 100,000 full-time employees.

While the transportation industry leads in the number of motor vehicle crashes, the service industry accounts for 14%, manufacturing 8% and the sales sector 7%. An estimated 62% of the vehicles occupied by a fatally injured employee are registered to a business or to the government.

Most wood product manufacturers do not have a large fleet of autos or trucks. If delivery is provided, the drivers encounter common driving hazards such as traffic and parking lot congestion, poor road conditions and increased backing accidents.

A motor vehicle loss control program should address operations; driver qualification and experience; training and supervision; vehicle selection; maintenance and inspection; emergency equipment; and accident reporting, recording and analysis.

A commercial driver's license (CDL) is required for vehicles with a gross vehicle weight rating (GVWR) or gross combination weight rating (GCWR) of 26,001 lb. or more, inclusive of a towed unit with a gross vehicle weight rating of more than 10,000 lbs. A CDL is also required if a truck with a GVWR of 10,001 lb. or more is used on a highway in interstate commerce to transport wood products. The manufacturer is required to comply with the Federal Motor Carrier Safety Regulations (FMCSR) of the Department of Transportation (DOT). The FMCSR and its requirements for hours of service should be considered minimum standards for any trucking operation. Most states have adopted the FMCSR for their intrastate operations as well.

A thorough driver-qualification program is critical to the success of any business in which the operation of motor vehicles is a necessary function. Motor Vehicle Records (MVRs) should be obtained on hire and reviewed at least annually for all drivers. Drivers should obtain pre-hire and random testing of alcohol and drugs. In addition to drug testing, CDL drivers are initially required to successfully complete a medical examination. Medical exams must be taken every 24 months.

A road test allows the employer to recognize deficiencies in driving skills and provide needed training prior to assigning a driving task. New employees should be trained in defensive driving and refresher training should be regularly provided for all drivers. Drivers should also be trained, certified and experienced in use of materials-handling devices such as handcarts and forklifts.

EMERGING ISSUES

A six-year study conducted by the Tulane University Medical Center reveals that breathing wood dust does not pose an adverse health risk to respiratory functions. While the study did not address potential carcinogenic effects of the respiratory system, it will aid in the development of a sound scientific basis for a safe wood dust exposure level. To date, the Environmental Protection Agency (EPA) has not developed an indoor air-quality standard.

The wood industry had previously recommended a threshold limit value of 1mg/m³ for most species of wood dust based on both cancer and non-cancer health effects. This TLV cannot be achieved with available dust control technology. An unreasonable wood dust regulation would create adverse industry-wide effects by imposing impracticable cost burdens due to regulation compliance, equipment re-engineering and potential job losses.

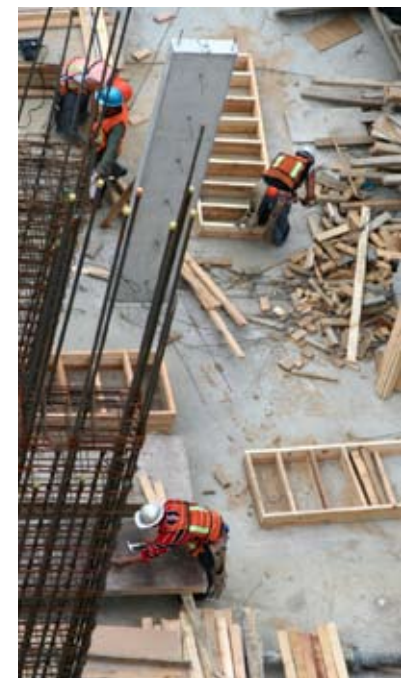
Of special interest to furniture manufacturers is the formaldehyde emission level in furniture systems and seat products. The U.S. Green Building Council established a program that verified certain manufacturers are in compliance with the desired emission level of 50 parts per billion. Customers of office furniture manufacturers are now asking for reduced levels of formaldehyde and other volatile organic compounds in furniture products.

Residential furniture plants continue to close down. While some companies are struggling to grow, there is an increase in one-man operations. The woodworking industry was buoyed by the housing market in 2005. With increasing interest rates and leveling of growth for the housing market, it is likely that the cabinet market will continue to benefit. The sales of imported furniture continue to rise, and it is anticipated that foreign manufacturers will soon bypass the state-side brands.

EXPERTISE IN PARTNERSHIP

UBI Loss Control representatives may visit your facilities to make a survey of your premises and operations. The survey can result in either suggestions to reduce potential accidents or act as a gateway to more specialized loss control services, including industrial hygiene and ergonomic evaluations. The Loss Control representative can review existing programs or assist in the design of comprehensive safety programs for the various types of woodworking operations.

For more information or if you have questions, please call 800-777-2249 and ask for Loss Control Services. For questions about your policy, please contact your agent.



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