



Risk Management Considerations for Woodworking Shop Facilities

Woodworking shops are inherently prone to fires and explosions. They contain large quantities of fuel in the form wood products, sawdust and flammable materials such as paints, oil finishes, adhesives and solvents.

Sawdust ignites and burns easier than whole pieces of lumber. Sanders, routers and shapers produce large amounts of fine dust which is especially hazardous because it accumulates on rafters and other structural components all around the facility contributing to a fire situation.

Woodworking shops contain ignition sources such as faulty electrical wiring, cutting and welding operations, sparking tools, propellant actuated tools and smoking. There is also the potential for static electrical discharges. All shop users should be aware of the potential hazards and receive training on the proper use of equipment, safe guards and housekeeping practices.

Housekeeping

Good housekeeping practices help to control sawdust. The small grains of wood dust, when scattered throughout a confined area, can explode with tremendous force if ignited by a spark or match.

The best way to minimize the possibility of fire in wood processing areas is to provide adequate ventilation. If dust

and fumes are vented by a dust collector or vacuum and fresh air is constantly provided, the fire hazards associated with dust will be minimized. Never cleanup saw dust using blow-down compressed air. This may create a dust cloud that could provide the right atmosphere for an explosion. Vacuum all sawdust after work and avoid dry sweeping where possible. Remember to clean wood dust from around and inside the machines.

The Ontario Fire Code, 5.10.2.4. states that loose sawdust, particles and shavings shall be swept up at frequent intervals and deposited in receptacles described in sentence 2.4.1.3.(3).

The Ontario Fire Code, 2.4.1.3. (1) states that materials subject to spontaneous ignition, such as sawdust and greasy or oily rags, shall be deposited in a rated and approved receptacle that is constructed with noncombustible materials, has a close fitting and self- closing metal cover. If the floor surface where the container is stored is combustible the container shall have a flanged bottom or legs not less than 50 mm (2") high. The container shall not be placed within 1 metre (3.28 ft) of any combustibles materials.

Dust Collection Systems

The Ontario Fire Code, 5.10.2.1. states that every machine that produces sawdust, particles or shavings shall be provided with a blower and exhaust system installed

in accordance with NFPA 91, “Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids”.

Dust collectors can connect to machines and remove dust particles from the air. The connection should be as tight as possible to ensure effective dust collection; the dust-collecting systems should be made of noncombustible materials and designed to prevent sparks.

Equipment required to have a dust-collecting system shall be interlocked to prevent it from operating if the dust-collecting system is not in operation as per Ontario Fire Code 5.10.1.9.

Dust collectors should be installed outside the building and should be protected by automatic sprinklers. In extensive facilities where sparks can be expected, spark detection, arrestors and extinguishment can be installed in the ductwork to ensure a spark will not reach the materials in the duct collector.

Storage

The quantity and method of wood product storage should be reviewed to ensure the piles of wood are solid, the storage shelves are well constructed and wood piles do not obstruct sprinkler protection (if applicable) and ensure that all emergency exits are accessible at all times.

Adequate separation should be provided between any wood products and heating equipment or ignition sources.

Flammable and combustible liquids are commonly located within woodworking shops, including paint, thinners, solvents and various cleaners. All flammable and combustible liquids should be stored in a ULC approved flammable liquids cabinet and should be separated from storage and work areas. When flammable and combustible liquids are removed from the cabinet for use, only the amount required should be taken with the balance being placed back in the flammable liquids cabinet.

Associated Hazards Spontaneous Combustion

Spontaneous Combustion

If wood dust is not disposed of in a safe manner, spontaneous combustion could occur. Spontaneous combustion occurs without an external ignition source. A substance with a relatively low ignition temperature begins to release heat, by oxidation or fermentation, for example.

The heat is unable to escape and the temperature of the material rises above its ignition point. Combustion will begin if a sufficient amount of oxygen or another oxidizer is present. This type of combustion can also occur from oily rags used with certain types of paints, varnishes, and solvents, linseed oil along with wood dust.

Electrical Hazards

Every precaution should be taken to guard against the ignition of wood products or wood dust. Electrical equipment can be a potential source of ignition:

1. Arcs and sparks - Produced by the normal operation of equipment, such as motors, starters and switches.
2. High temperatures - Some heat-producing equipment such as lamps and lighting fixtures can ignite flammable material or combustible products if they exceed the ignition temperature of the material. The National Electrical Code, rule JB18-054, indicates that any heat producing equipment with temperatures above 100°C (212°F) requires a temperature code (T-code) marking.
3. Electrical equipment failure - A burned out lamp socket or terminal short could spark a fire.

Remember to keep all electrical equipment and wiring in good repair. Extension cords are electrical hazards and can cause a trip hazard.

Smoking

Smoking should not be allowed in the building and all smoking areas should be well separated from the building. Signage should be installed on the interior and the exterior of the building as required by the Ontario Fire Code stating that no smoking is allowed. In addition, attention should be made to ensure no one smokes near fresh air ventilation intake louvers or ductwork.

Fire Protection

1. The woodworking area should be constructed using fire-resistant materials. Fire doors should be used to help contain the spread of fire. Any penetrations in fire separations (walls) should be tightly sealed to help stop the spread of fire as well as wood dust.
2. A sprinkler system should be installed in woodworking areas and the design should meet the NFPA 13 requirements with an Ordinary Hazard Group 2 Design. The sprinkler system design may need to be

upgraded if the facility contains high-piled material or large quantities of wood in storage.

3. Fire extinguishers should be installed in highly visible locations and near all exits.
4. Fire hose racks may be required by the authorities having jurisdiction.
5. Install an alarm system with pull stations, detectors and notification devices to warn occupants and allow for safe escape from the building.
6. Establish emergency/fire safety plans and practice fire drills.
7. Install emergency lighting to aid in the evacuation of the building.
8. Ensure exits signs are visible, point to the direction of the exit and are illuminated at all times.
9. Maintain first-aid kits.

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