



WOODWORKING/WOOD REFINISHING SHOP

LOSS CONTROL BULLETIN

grinnellmutual.com

CONSTRUCTION REQUIREMENTS

The woodworking shop area and the furniture refinishing/spray area should be separated from all other occupancies, if any, within the same building by two-hour fire rated construction.

The wood shop area should be separated from the refinishing area/spray room or booth area by minimum of one-hour fire-rated construction.

Unless local codes are more restrictive, the minimum fire rating of all walls, floors, and ceilings should be one-hour fire-rated construction.

All doors and door frames between the woodworking shop/spray area and any other occupancy within the building should be two-hour fire-rated, self closing fire doors.

All doors and door frames between the woodworking shop and the spray area should be self closing, one-hour fire-rated doors.

Aluminum shall not be used for structural support members or for walls or ceilings within the spray booth or spray room enclosure. Aluminum shall also NOT be used for ventilation ductwork associated with a spray room or spray booth.

Spray rooms or spray booths shall maintain a minimum

distance of 3 feet to surrounding structural members and/or all combustible materials.

Paint storage rooms of 150 square feet or less should have a construction fire rating of one hour. Storage rooms of 151 to 500 square feet (maximum) should have a construction fire rating of two hours.

Flammable liquid storage room doors should be listed for 1.5 hour fire doors with self closing devices.

Noncombustible, liquid-tight raised door sills or ramps at least 4 inches in height should be present within the interior of all flammable liquid storage rooms near exit doors from this area.

WIRING SPRAY ROOMS/BOOTH AND FLAMMABLE/COMBUSTIBLE LIQUIDS STORAGE ROOM AREA

All wiring within the facility should be installed by a licensed electrician in accordance with the National Electric Code.

All wiring within the spray room/booth AND flammable/combustible liquids storage/mixing room should be listed for Class I, Division 1 locations (Explosion-proof). If flammable/combustible liquids are stored within a UL Listed or Factory Mutual Approved Flammable Liquids storage cabinet, the wiring in the mixing/dispensing room has to be listed for Class I, Division 1 locations.

WOODWORKING/WOOD REFINISHING SHOP

LOSS CONTROL BULLETIN

grinnellmutual.com

All lights within the spray room/booth should be Class I, Division 1 explosion-proof type. An alternative is to install conventional recessed lights within the walls or ceilings and protect them from flammable/combustible vapors by installing sealed covers of wired or tempered glass over the fixtures and bulbs. No portion of these recessed fixtures should extend beyond the interior wall or ceiling of the spray room or booth.

All wiring, switches, outlets, or other electrical devices outside the spray booth but within 3 feet of any opening into the booth must be Class 1, Division 2 (i.e. explosion-proof type).

Spray finishing of flammable/combustible liquids must be performed within an enclosed or open-front spray booth. Spraying flammable/combustible liquids in an open area outside of a spray booth does not meet Grinnell Mutual underwriting guidelines.

If the exhaust ventilation system is interlocked with the spray equipment (i.e. spray equipment cannot operate unless the ventilation system is in operation), all wiring within 5 feet horizontally and 3 feet vertically from an open-front spray room or spray booth shall be listed for Class I, Division 2 locations.

If the ventilation system is NOT interlocked with the spray equipment, the Class I, Division 2 wiring should be located within 10 feet horizontally and 3 feet vertically from the open-front spray room/booth.

All wiring within 3 feet of any door opening within an enclosed or open-front spray room/booth should be listed for Class I, Division 2 locations (even if the ventilation is interlocked with the spray equipment).

WIRING A WOODWORKING SHOP

All wiring within the woodworking shop should be listed for Class II, Division 1 areas (i.e. dust ignition-proof wiring).

Any areas handling dry wood waste shall have Class II, Division 1 electrical wiring, lights, and equipment.

EXHAUST FANS IN SPRAY ROOM/BOOTH

The spray room/booth must have an exhaust system. The wiring to the exhaust fan must be Class I, Division 1 explosion-proof.

Exhaust fan motors, if within a spray area, must be explosion-proof type, not just spark-proof.

Belt-driven exhaust fans in a spray booth or room should have the belt and pulley assembly fully enclosed. Electrical motors driving exhaust fans should not be located inside the spray area or within exhaust ducts where flammable/combustible vapors may travel across the motor, unless the motor is rated for Class I Division, 1 locations.

Exhaust fan motors outside of the spray room or booth and outside of the ventilation system ductwork are not required to be explosion-proof. The motor may be located outside the ventilation ductwork with an enclosed belt between the motor and the fan blades within the ventilation ductwork. The fan blades must be nonferrous.

Supports and holders for filters shall be constructed of noncombustible materials.

Filters shall be noncombustible type specifically listed for use near flammable/combustible liquid spray areas.

Overspray collection filters shall be readily removable or accessible for cleaning or replacement.

HEATING UNITS

All furnaces or heaters should be UL Listed, AGA Listed, or tested by a reputable testing laboratory to confirm that the heaters are capable of functioning as intended. Heating equipment should be installed in accordance with the manufacturer's recommendations.

WOODWORKING/WOOD REFINISHING SHOP

LOSS CONTROL BULLETIN

grinnellmutual.com

Unlisted woodstoves or heating appliances of any type are not permitted within this commercial occupancy.

Whenever possible, heating appliances should be located outside the woodworking or wood processing area.

Heating appliances should be kept clean and free of sawdust accumulations on the exterior jacket of the unit and inside the appliance cabinet. Vacuum equipment specifically listed for use in Class II, Division 1 areas should be used to remove sawdust from heating appliances on a frequent basis to maintain sawdust to a minimum in and on the heating unit.

Compressed air should **not be used** to remove sawdust from heating appliances, shelving units, or other flat surfaces where sawdust may settle within the facility. Placing sawdust in suspension through the use of compressed air increases the probability of a dust explosion.

There should be no open flames, infrared heaters, spark producing equipment, or heat sources inside the spray booth/spray room.

Heating units should be separated from the spray room/booth by one-hour fire-rated construction with no openings less than 8 feet above the floor between the furnace room and the spray room/booth. All doors into the furnace room should be from outside the building.

Heat ducts should terminate flush with the interior walls and ceilings of the booth or spray room. They should not extend into the room or booth.

The cold air return for the heating unit should be outside

the building. No cold air return should come from the spray booth or woodworking shop.

The duct outlet into the spray room/booth should contain a noncombustible filter to prevent overspray from accumulating within the duct.

Use Class II, Division 1 vacuum equipment to remove sawdust in and on the heat ductwork.

STATIC ELECTRICITY

Where equipment is subject to the accumulation of static electric charge, it shall be controlled by one of the following:

- Permanent bonding and grounding of production equipment
- Grounded metal combs to provide discharge paths
- Dust collection hoses shall be conductive and grounded and shall dissipate static electricity.

FOREIGN MATERIALS

Wood stock shall be inspected for foreign materials such as nails, fencing, wires, metal straps, etc. by visual inspection and the use of magnets prior to being processed. These should be removed prior to the wood entering the processing area.

FLAMMABLE/COMBUSTIBLE LIQUID STORAGE

Storage cabinets used to store flammable/combustible liquids should be UL Listed or Factory Mutual Approved Flammable Liquids Storage. These cabinets should be clearly labeled as to their contents. Signs should be posted on and near the cabinet that no smoking or spark-producing equipment should be in operation near these cabinets.

WOODWORKING/WOOD REFINISHING SHOP

LOSS CONTROL BULLETIN

grinnellmutual.com

There shall be not more than three approved/listed flammable liquids storage cabinets within any single fire division or processing area.

Any single cabinet shall contain NOT more than 120 gallons of Class I, Class II, or Class IIIA liquids, of which not more than 60 gallons shall be Class I and Class II liquids. (Consult the MSDS sheet on each chemical to determine its classification).

Dispensing or transfer of flammable/combustible liquids from containers, mixing of liquids, and filling of containers shall be done only in a mixing room or in a spray room/booth where wiring is listed for Class I Division, 1 locations (explosion-proof wiring).

DUST EXPLOSION PREVENTION

Dust collection systems shall be designed to incorporate dust explosion venting equipment.

Windows, doors, lightweight building material panels, and/or listed explosion venting devices should be installed within exterior walls and roofs to relieve the pressure of an explosion. The design of the building should be such that the release of pressure through windows, doors, lightweight building panels, etc. will not weaken the structural integrity of the building. The pressure release through these openings should not allow pressures to enter adjacent interior spaces within the structure or within exposure buildings in the area.

DUST COLLECTION

Dust collection equipment should be installed near all nonsparking woodworking machines. The equipment should be specifically listed for use in woodworking occupancies (i.e. shop vacuums are not acceptable).

Dust collection equipment shall be in operation whenever

woodworking machines are in operation to control potential dust being placed into suspension.

Every section of the collection system shall be sized for not less than the minimum air velocity and volume required to collect and transport the sawdust through the duct system and into the collection equipment.

Ductwork shall be metallic. Exception: Flexible ducting shall be permitted for final machine connection in a length not exceeding the minimum required for machine operation. Non-conductive ducts, such as PVC pipes, shall not be permitted.

Ductwork shall be bonded and grounded to control potential static electricity.

Hoods or enclosures shall be designed and located such that wood dust particles generated will fall, be projected, or be drawn into hoods or enclosures to minimize dust emissions without interfering with the safe and satisfactory operation of the machine.

All hoods and enclosures shall be of noncombustible construction unless protected with an automatic sprinkler system.

Dust collection equipment shall be constructed of noncombustible materials (filter bags and explosion vent diaphragms fabricated from combustible materials shall be permitted).

Dust collectors shall be located outside.

HOUSEKEEPING

Housekeeping and inspection programs shall be developed and documented. In an effort to reduce a potential dust explosion, National Fire Protection Association standards

WOODWORKING/WOOD REFINISHING SHOP

LOSS CONTROL BULLETIN

grinnellmutual.com

recommend dust on flat surfaces within the building not exceed $\frac{1}{8}$ of an inch over 5 percent of the square foot area of the woodworking shop.

Any waste material or debris found in large enough quantity that the material is heavily coated or is in any way impeding the operation of powered or manual equipment, shall be collected and removed from the building immediately.

Combustible waste (i.e. scrap wood, shop cloths, paper related products) shall be placed in covered metal receptacles until removed to a safe exterior location for daily disposal.

Any metal collected through the cleanup process shall be separated from wood debris or combustible waste to prevent entry into the wood processing, dust collection, or scrap wood hog.

Spaces inaccessible to perform frequent routine housekeeping, shall be sealed to prevent dust accumulation.

Combustible or flammable liquid spills or leaks should be cleaned up immediately and cleanup materials (shop cloths etc.) along with potential oil-soaked cloths or waste materials should be disposed of within an approved metal safety can with self closing lid. The contents of these safety cans should be removed to the exterior of the building daily!

Removal of dust from surfaces shall be in a manner that minimizes the generation of dust clouds. Blowing down with steam, compressed air, or even vigorous sweeping shall be permitted only if the following requirements are met:

- The floor area and equipment shall be vacuumed prior to blow down.
- Electrical power and other sources of ignition shall be

shut down, removed from the area or the equipment being used should be classified for use in Class II, Division 1 or Division 2 locations (i.e. dust ignition-proof equipment).

No smoking should be permitted within any portion of the building.

HOT WORK

Hot work would include, but not be limited to the following:

- Welding
- Cutting
- Grinding
- Use of power tools

Repair, maintenance, and installation of new equipment as well as other processes involving hot work may on rare occasions need to be performed within areas which are classified as hazardous locations. Hazardous locations may include, but not limited to, areas where processes generate combustible dust on a frequent or occasional basis, where spray finishing of flammable/combustible liquids is performed, and in areas where flammable/combustible liquids are stored or handled.

Prior to performing hot work in a hazardous location, alternatives should be considered.

- Perhaps work on components being cut, welded, etc. could be moved to a nonhazardous location and then moved back and installed without using hot work processes.
- Move flammable/combustible liquids and/or combustible materials out of the area prior to performing hot work.
- Remove combustible materials, including combustible dust, from the area in a safe manner prior to performing any hot work.

WOODWORKING/WOOD REFINISHING SHOP

LOSS CONTROL BULLETIN

grinnellmutual.com

If the above cannot be performed the following should be addressed prior to performing any hot work:

- All flammable/combustible liquid spray operations should be ceased a minimum of 30 minutes prior to performing hot work and should not resume until 30 minutes after hot work has been completed.
- All dust-producing equipment should be shut down a minimum of 30 minutes prior to performing hot work and processes producing dust should not resume for a minimum of 30 minutes after hot work has been completed.
- A fire watch should be established prior to performing any hot work. This should include selecting an individual familiar with the hazards of hot work, the ability to identify hazards in the area where hot work is being performed and the ability/experience to operate a portable fire extinguisher designed for the area where hot work is being performed. The fire watch's sole responsibility should be to remain in the immediate area where hot work is being performed to identify/extinguish any fire or smoldering materials.
- An ABC dry chemical portable fire extinguisher should be available for use in the immediate area of the fire watch employee. The individual assigned the fire watch responsibility should have the ability at any time to stop hot work operations if it is determined it is unsafe to proceed. The fire watch should continue to identify and extinguish any flames or smoldering materials a minimum of 30 minutes after the hot work has been completed.

MACHINE BEARINGS

All equipment operated within a combustible dust producing location shall be monitored for proper operation and lubricated frequently to prevent potential frictional heating. Consider purchasing alarms or safety monitoring equipment for bearings and related machine parts. This

equipment should alert personnel working in the immediate area of a potential for frictional heating of bearings and related machine parts.

CONTROL OF IGNITION SOURCES

An evaluation of all combustible dust-producing areas should be conducted on a frequent basis to identify and eliminate all potential sources of ignition.

LIFE SAFETY

There shall be a minimum of two exits from the shop (neither of which can be an overhead door) to the exterior of the buildings. The exit doors should swing with the path of travel to the exterior of the building.

Illuminated exit signs should be present within the building and the maximum travel distance to reach an exit should not exceed 75 feet.

Emergency lighting units shall be present if one or more of the following conditions exist:

- The building is windowless or any portion of the shop is located below ground level.
- The building is two or more stories in height.
- The occupancy is subject to 50 or more persons above or below ground level
- The entire building is subject to 300 or more persons.

PORTABLE FIRE EXTINGUISHERS

At least one 10 pound ABC portable fire extinguisher should be present for each 1000 square feet within the building.

All portable fire extinguishers should be wall-mounted in visible and easily accessible areas, and the maximum travel distance to reach a portable fire extinguisher should not exceed 30 feet.

WOODWORKING/WOOD REFINISHING SHOP

LOSS CONTROL BULLETIN

grinnellmutual.com

All fire extinguishers should be serviced by an outside fire extinguishing service contractor on an annual basis.

The guidelines in this brochure are based, in part, on the following:

- **NFPA 30** (Flammable/Combustible Liquids Code)
- **NFPA 33** (Standard for Spray finishing of flammable/combustible Liquids)
- **NFPA 664** (Standard for Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities)
- **NFPA 101** (Life Safety Code)
- **NFPA 51B** (Standard for Fire Prevention During Welding, Cutting and Other Hot Work)
- **NFPA 70** (National Electric Code)
- **NFPA 10** (Standard for Portable Fire Extinguishers)

PREVENTION IS EVERYONE'S BUSINESS. TRUST IN TOMORROW.® CONTACT YOUR AGENT TODAY TO LEARN ABOUT OUR LOSS PREVENTION PROGRAMS.

This bulletin has been prepared as an underwriting reference for members of Grinnell Mutual Reinsurance Company and does not signify approval or disapproval by the Company of any product or device. Please do not copy or reproduce any portion of this bulletin without the written permission of Grinnell Mutual Reinsurance Company. The information included in this publication and program was obtained from sources believed to be reliable, however Grinnell Mutual makes no guarantee of results and assumes no liability in connection with its use. It is the user's responsibility to comply with any applicable regulations or laws. Information obtained from or via Grinnell Mutual should not be used as the basis for legal advice, but should be confirmed with alternative sources. Grinnell Mutual Reinsurance Company, Grinnell Mutual, and coordinating logos or marks are registered trademarks of Grinnell Mutual Reinsurance Company. © Grinnell Mutual Reinsurance Company, 2017.

AUTO | HOME | FARM | BUSINESS



LCB 30 (8-17)