Manufacturing Intelligence:

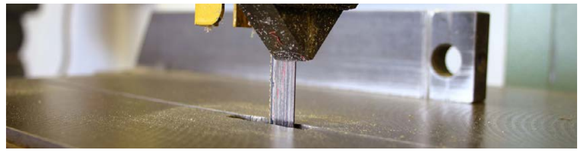
Manufacture of Wooden Furniture

Manufacturing Processes

We know that your clients take risk management seriously and that it plays a key role in the service you offer. We've produced this guide to highlight the controls your clients can take to help reduce the risks associated with the types of machinery used in the woodworking trade.

The furniture industry is a large consumer of timber, plywood, MDF and other engineered wood. Fixed power-driven woodworking machinery is extensively used. Manufacturers can range from small furniture specialists to high volume manufacturers such as flat pack or bedroom/office furniture, which can also include upholstery processes and furniture restoration.

Band saw



A band saw is a common item of machinery found in woodworking premises. It uses a blade consisting of a continuous band of toothed metal rotating on opposing wheels to cut material which in this case will be timber. Fixed dust extraction can be installed to reduce the build-up of wood waste and sawdust.

Rip saw

A rip saw is a special type of powered saw that cuts in the direction of the grain. The teeth on the saw are specially designed so that they effectively scrape away the wood rather than cutting it, acting like small chisels.

Spindle moulder

Designed to shape wood into profiles. It's typically used for creating grooves, rebates and bevels. Various tooling is used on the spindle to create the necessary cut.

Risk Features

Business Interruption

Wood workshops are often open-plan and therefore fire has the ability to spread rapidly causing extensive damage. The lack of separation or division means all plant and equipment even if not directly involved in an incident, is susceptible to collateral smoke and water damage even from a small fire. Physical separation with good fire resistance helps to control damage and therefore may allow some operations to continue to run after a loss. Woodworking machinery is readily available with no major delays other than for the largest of automated plant.

There are often no special building requirements other than adequate power supplies, so temporary premises should be available in the event of a loss. Tooling on machines for special designs is important and duplicates should be available where required.

Public and Products Liability

Good design of furniture for weight loading and functionality requires extensive testing in line with industry standards which needs to be evidenced and recorded.

Good quality control management and traceability is essential. Even in the woodwork industry, potential increased litigation risk exposures (relating to the USA and Canada) exist. In addition, the use of expanded foams in upholstery and flame retardant coverings need to be certified and tested by a competent testing authority i.e. European (EN)/ British (BSI) standards.

Risk Features

Material Damage

There's an inherently high risk of fire and dust explosions within woodworking premises due to the combustible nature of the materials in use. It's essential that high standards of housekeeping are maintained, particularly for waste wood/dust and storage of materials (internally and externally). Inadequate housekeeping can result in the accumulation of sawdust increasing the risk of primary and secondary dust explosions.

The use of appropriately designed fixed extraction systems, maintained and inspected under Local Exhaust and Ventilation (LEV) requirements help to control the risks associated with the build-up sawdust. Spark detection and suppression systems within the extract ductwork may be needed to mitigate the risk of incidents.

The burning of wood to remove waste or heat the premises in biomass or wood burners is increasing. The sale of waste wood to others for biomass processes is also increasing. Control of this waste is essential to ensure storage isn't excessive and doesn't increase the fire risk within the main premises. External storage facilities are usually required, away from the main building.

Employers Liability

Traditionally, good quality furniture manufacture involved skilled craftsmen working manually with solid wood. Whilst these skills do survive in some businesses, there's now extensive use of automated and semi-automated machinery including powered bench saws, crosscut saws, band saws, spindle moulding machines, sanders, routers and wood lamination presses.

Consequently, adequate guarding, training, supervision and maintenance are required to protect employees. Wood dust and stain fumes can cause asthma. Wood dust is a carcinogen, so dust and fume exposure should be controlled, for instance, through local exhaust ventilation and other means, with personal protective equipment a last resort. Noise and vibration are also common hazards due to use of machinery and therefore machine selection, segregation and maintenance are key focus areas. Medical screening, such as lung function and audiometric testing, are essential controls for employees in exposed areas.

Consideration should also be given to ergonomics for assembly work, risks from use of hot glue processes and manual handling related issues. Woodworking businesses, like many others, frequently use forklifts and there's extensive handling and storage work associated with volume flat pack furniture type manufacturers.

Common Material Damage and Business Interruption Hazards

The tables below highlight some specific hazards present in woodwork environments, along with the associated controls which will help prevent major loss of physical property. Generic risks resulting from arson, electrical sources and waste aren't mentioned here.

Features always present

Hazard	Control
Use of highly flammable liquids including adhesives.	▪ Limited to daily requirements in the workshop. Up to 50 litres can be kept in fire cabinets or similar. ▪ Remainder should be kept in an external secure storage facility (internal fire compartment) designed for the purpose with an adequate bund. High and low ventilation, extraction and protected electrical installation are important.
Production machinery producing wood waste and sawdust.	▪ Provision of a suitably designed Local Exhaust Ventilation (LEV) systems to remove sawdust. ▪ The LEV system must be maintained appropriately ensuring collection is reliable and emptied as required to maintain efficiency. ▪ LEV – 14 month inspection periods required.

Hazard	Control
Ignition of sawdust in LEV systems causing fire or primary dust explosion. **Primary dust explosions can disturb dust within the building which can result in a more destructive secondary explosion causing extensive damage.**	▪ Ensure general housekeeping standards are maintained to remove accumulation of sawdust from the building including high level ledges. ▪ Provision of suitably designed explosion relief panels in process plant/extract ducting vented to a safe area preferably outside. Refer BS EN 14491 – Dust explosion venting protective systems. ▪ Provision of a suitably designed, installed and maintained spark detection and suppression system.

Common Material Damage and Business Interruption Hazards

Features sometimes present

Hazard	Control
Spontaneous combustion due to the application of lacquers, oils or plasticised material for the finishing of the product.	■ Dirty overalls and oily rags to be stored in metal lidded bins and removed from the premises overnight.
Use of waste wood burners to reduce waste or use for premises heating.	■ Adequate fire stopping around the flue pipe as it leaves the building. ■ Supplies of waste wood kept away from the burner. ■ Burner allowed to die down and not fed during the last hour of the working day. ■ Adequate clearance maintained around the burner with no combustible storage. ■ Wood extraction from machinery may be fed directly to a hopper which feeds the burner. An appropriate maintenance regime should be in place. The system should incorporate fire dampers and suppression/ drenching system.
Risk of Compressor and Pressure Plant Explosion.	■ Site outside of main building for larger premises. Allow for pressure relief. Regular maintenance is essential.
Fire resulting from storage of foam upholstery materials.	■ Keep working quantities as low as possible and use a secure store area away from fire risk.

Common Material Damage and Business Interruption Hazards

Employer's Liability and Public Liability

Hazard	Control
Use of powered saws.	■ Good robust guarding of dangerous parts. ■ Employee training and an authorisation matrix needs to be in place for permitted use of equipment.
Use of spindle moulders, sanding/ laminating machines.	■ Authorised operators only. ■ Good exhaust ventilation controls.
Assembly work, use of hot glue guns etc. Workplace transport.	■ Good ergonomic assessment and workplace practices, task rotation and ventilation extraction. ■ Manual Handling training essential. ■ Training, assessment and monitoring of all mechanical handling plant.

Common Material Damage and Business Interruption Hazards

Products Liability

Hazard	Control
Inadequate design. **Fabrics/foams to BSI/EN flame retardant standards.** **Inadequate packaging.**	■ Formal design and extensive testing process, adequately documented. ■ Good quality management controls and recall procedures. ■ Robustness of packaging and weight limits clearly marked regarding flat pack type products.

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