



Health and Safety Training in Design and Technology

Design and Technology Association
Specialist Extension Level S7HS Wood Turning Lathe

Wood Turning
Lathe

Forename: _____ Surname: _____

School / College/ Institution _____

Course date: / /

These Training and Accreditation Guidelines are based on the following essential publications:

- Health and Safety Training Standards in Design & Technology: D&T Association
- BS 4163:2014 BRITISH STANDARD Health and safety for design and technology in educational and similar establishments – Code of practice
- Model Risk Assessments for D&T in Secondary Schools and Colleges: CLEAPSS

Please tick against each of the standards below to confirm your knowledge, skills and understanding and that you have completed Assessment Tasks 1 and 2. The RDTHSC/Trainer will sign and date this form on completion

Colleagues must be able to demonstrate, thorough practical activities, their capability in using a wood turning lathe, and their knowledge and understanding of:

Tick

1. The types, parts and functions of the machines commonly found in school workshops, particularly the controls, safety devices; routine maintenance and the specific hazards *e.g. dangers of rotating parts, out-of-balance masses*

2. The safe holding of work pieces including the mounting and removal of chucks, face plates, fork drives etc.

3. The safe preparation of timber to be turned *e.g. removing corners, the dangers associated with laminates, ensuring that surfaces to be mounted on a face plate are flat*

4. The selection and holding of appropriate types of tool, selection of correct speeds

5. The need to use tools designed for use on the wood lathe *e.g. do not use as scrapers modified tools such as files*

6. Common faults caused by incorrectly mounted work; wrong speed or feed; and their associated early warning signs.

RDTHSC/Trainer signature: _____

Date: _____

Assessment Task 1

Knowledge and Understanding

1. The types, parts and functions of the machines commonly found in school workshops, particularly the controls, safety devices; routine maintenance and the specific hazards e.g. dangers of rotating parts, out-of-balance masses

Know that:

- The school/college should decide whether wood turning lathes are suitable for use by particular groups of learners, based upon maturity and competence, the level of supervision, and local authority/employer and national guidelines
- Learners should be fully instructed in the use of these machines before operating them, e.g. the hazards associated with the equipment and the risk control measures that are required
- Learners should be trained and instructed in safe operating methods by a competent member of staff who has attended a recognised training course
- Learners should be assessed and a record of their competence kept

Know the electrical installation requirements of wood turning lathes in school workshops:

- Emergency switching systems must be provided in each separate student work area
- The machine must be electrically isolated, using a fused switch-disconnector on or adjacent to the machine, controlled by a starter incorporating overload protection and no-volt release
- Isolation switches not incorporated in the equipment must be not more than 2 m away from the equipment and positioned so that they can be operated safely while the equipment is in use. The switch should be clearly marked with the name of the machine
- The machine should be provided with a conveniently positioned and accessible, emergency stop switch (which could be the normal "off" switch) or other suitable control device that can quickly stop the machine in an emergency
- Fixed guards (removable only with the use of a tool), or alternatively interlocked guards must enclose the drive mechanisms

Know the hazard of inhaling wood dust, i.e.

- The COSHH Regulations 2002 (as amended) require employers to prevent, or to adequately control, exposure by inhalation to wood dust. Dust from all types of wood, hardwood, softwood and composite materials such as medium density fibreboard (MDF) has been assigned a workplace exposure limit (WEL) of 5 mg m³. This is a time weighted average over an eight hour period. For both hardwood and softwood dusts the COSHH Regulations require employers to ensure that exposure by inhalation is reduced as far as reasonably practicable and in any case to below the WEL
- A risk assessment should be carried out on woodworking machinery to evaluate risks to health and any action required to prevent or control risks. This should involve consideration of the dust concentrations inhaled and the length of time exposed
- This is particularly important where machining operations produce fine dust that remains airborne and is easily inhaled
- Higher dust concentrations are produced from MDF than from hardwoods or softwoods
- Wood dust should be controlled by an effective local exhaust ventilation (LEV) system that captures and removes the dust at source before it can spread. The LEV should be properly designed, maintained and used correctly. LEV systems should be thoroughly examined at least every 14 months by a competent person and the results recorded and kept for a minimum of 5 years
- In addition to thorough examinations, a weekly check should be done to verify that the basic operational features are functioning correctly
- The presence of dust or chips on or around a machine is an indication that the LEV system might not be functioning correctly
- Where an effective LEV system is not in place, a dust mask conforming to BS EN 149:2001+A1:2009 class FFP3 should be used. Class FFP3 should be used when emptying or cleaning LEV systems and maintaining machines
- Training should be provided on correct use of respirators. Disposable filtering respirators should be replaced as appropriate in accordance with the manufacturer's instructions

Know:

- The capacity of the machine, i.e. maximum distance between centres and height of centre over bed
- The method of powering, speeds and method of varying speeds
- Only one person at a time should use the machine, i.e. only one side of the headstock should be used at any one time, the unused end of the headstock mandrel must be protected to prevent entanglement.

Knowledge and Understanding

Know:

- Equipment should be maintained in line the requirements of the 'Provision and Use of Work Equipment Regulations 1998', (i.e. by a person competent to repair and maintain machinery)
- The need to keep maintenance logs
- The need for electrical inspection and testing of equipment in line with 'The Electricity at Work Regulations 1989'
- The requirements of routine maintenance as recommended by the manufacturer, e.g. greasing bearings, tensioning drive belts, maintaining tool rests, sharpening drive centres and general lubrication of machined surfaces

Know that:

- Eye protection must be used when operating wood turning lathes
- Signs should be used in each area to advise on the use of personal protective equipment (PPE)
- Long hair should be protected from entanglement; loose clothing should not be worn; jewellery should be removed
- Floor surfaces should be level and non-slip and there should be sufficient space around machines to prevent operators from being pushed by passers by.

2. The safe holding of work pieces including the mounting and removal of chucks, face plates, fork drives etc.

Know:

- A variety of ways in which work pieces should be safely and securely held in the lathe, i.e. mounting work for turning between centres using fork and cone centres; screwing work onto a faceplate; using a woodturning chuck, for example, holding work with a screw chuck or expanding collet chuck
- The hazard of work pieces flying off if not correctly mounted to a faceplate, chuck or between centres.

3. The safe preparation of timber to be turned e.g. removing corners, the dangers associated with laminates, ensuring that surfaces to be mounted on a face plate are flat

Know how to safely prepare timber for turning, i.e.:

- Using sound, defect free material; preparing square stock for work between centres to a roughly octagonal shape; band sawing stock for work on face plates to a roughly circular shape; avoiding the turning of segmented material; ensuring that when materials are being laminated for pattern making, all surfaces are flat and adhesives are given time to fully set
- BS 4163:2014 recommends that if jointed material is used, it should only be turned under close supervision
- The hazards associated with wood turning arising from bad practice, e.g. disintegration of defective material and the dangers associated with built up and laminated work.

4. The selection and holding of appropriate types of tool, selection of correct speeds

Know:

- The range of tools that can be safely used for woodturning, e.g. scrapers, roughing out and spindle gouges, skew chisels, parting tools and bowl gouges
- The school should decide which tools are suitable for use by each group of learners, based upon maturity and competence, the level of supervision, and local authority/employer guidelines
- The correct angles to which to which different tools should be ground and how to maintain these tools in a sharp condition
- The importance of safe peripheral turning speeds and that the speed of the lathe must be compatible with the size, weight and length of wood to be turned

5. The need to use tools designed for use on the wood lathe e.g. do not use as scrapers modified tools such as files

Know:

- Only tools specially designed for wood turning should be used in school workshops
- Improvised tools, such as tools made from files, must not be used

6. Common faults caused by incorrectly mounted work; wrong speed or feed; and their associated early warning signs

Know:

- All work should be inspected carefully and rotated by hand before learners are allowed to switch lathes on
- Common faults that might arise, such as work incorrectly screwed to a faceplate running off centre and out of balance, work insufficiently secured between fork and cone centres, incorrectly positioned tool rest, unsuitable choice of speed

Assessment Task 2
Practical Skills

Colleagues should demonstrate through practical activities how to safely use a wood turning lathe

Machine operation:

Turning between centres, to demonstrate:

- Correct mounting of work between fork and cone centres
- Correct positioning of the tool rest for different tools, recognising the importance of keeping the rest as close as possible to the work piece to minimise the downward leverage on the tool
- That the lathe should always be stopped before measuring the work piece or adjusting the tool rest
- How to hold and support different tools, e.g. holding scrapers in the trailing mode, holding cutting tools so that the bevel (grinding angle) rubs the wood behind the cut
- How to cut 'downhill', or with the grain
- How to use abrasives, i.e. by removing the tool rest, sliding the tool post to a safe position and directing dust directly into a dust extraction inlet (if available)
- How to polish work safely, i.e. avoiding the use of rags or aprons

Faceplate turning, to demonstrate:

- Correct mounting of work onto a faceplate
- As above

Using a woodturning chuck, to demonstrate:

- Correct mounting of work onto a screw chuck, e.g. turning the outside of a bowl
- Correct use of an expanding collet chuck, e.g. turning the inside of a bowl
- As above

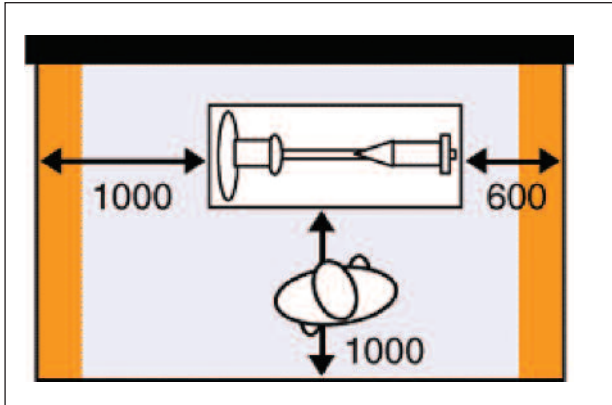
Safety checks, to demonstrate:

- Leaving the lathe safe for the next operator when turning is complete, e.g. setting the lathe to the slowest speed, turning off the isolator, returning all tools to the storage rack.

Supplementary materials

The space-allocation diagram indicates the clear working space required on either side of the machine

Wood Turning Lathe



The following references provide additional notes and guidance to support training sessions:

www.hse.gov.uk/pubns/woodindx.htm

Hyperlink to a series of HSE leaflets, all available as PDF files. Guidance on a range of issues relating to the use of woodworking machinery and the collection of dust, i.e.

'Safe working at woodworking machines' – woodworking sheet 15

'Wood dust: hazards and precautions' – woodworking information sheet 1

'COSHH and the woodworking industries' – woodworking information sheet 6

'Wood dust – controlling the risk' – woodworking information sheet 23

'Selection of respiratory protective equipment suitable for use with wood dust' - woodworking information sheet 14

'Toxic woods' – woodworking information sheet 30

'Safe collection of woodwaste: prevention of fire and explosion' – woodworking information sheet 32