Unit 217: Set up and use transportable cutting and shaping machines

# Delivery guide

Unit information

This unit is about the safe set up and use of portable power tools used within the construction industry.

Learners may be introduced to this unit by asking themselves questions such as:

* How do I know which saw blade to use?
* What regulations cover the use of power tools?
* What does HSS, TCT and SDS stand for?
* How do I know what voltage a power tool is?
* How do I check a power tool is safe to use?
* When would I use a router jig?

Learning outcomes

1. Understand resource selection
2. Understand working to a contract specification
3. Comply with the given contract information to carry out the work safely and efficiently to the required specification

Suggested resources

* BS 8000-5:1990. *Workmanship on building sites. Part 5: Code of practice for carpentry, joinery and general fixings.*
* BS 8000-0:2014. *Workmanship on construction sites. Part 0: Introduction and general principles.*
* BS EN 13647:2021. *Wood flooring and wood panelling and cladding. Determination of geometrical characteristics.*
* ISO 19049:2016. *Timber structures. Test method. Static load tests for horizontal diaphragms including floors and roofs.*
* BS 8233:2014. *Guidance on sound insulation and noise reduction for buildings.*

Websites

* [Cadw (gov.wales) | Homepage](https://cadw.gov.wales/)
* [TRADA | Timber Research and Development Association](https://www.trada.co.uk/)
* [NHBC Standards 2021 | House-Building Standards](https://nhbc-standards.co.uk/)
* [BWF | Homepage](https://www.bwf.org.uk/)

Legislation

Approved Codes of Practice (ACOPs)

* [GOV.UK (www.gov.uk) | Building regulations approval](https://www.gov.uk/building-regulations-approval)
* [GOV.UK (www.gov.uk) | The Personal Protective Equipment at Work Regulations 1992](https://www.legislation.gov.uk/uksi/1992/2966/contents/made#:~:text=The%20Personal%20Protective%20Equipment%20at%20Work%20Regulations%201992,9%20Information%2C%20instruction%20and%20training%20More%20items...%20)
* [GOV.UK (www.gov.uk) | The Manual Handling Operations Regulations 1992](https://www.legislation.gov.uk/uksi/1992/2793/made)
* [GOV.UK (www.gov.uk) | The Control of Noise at Work Regulations 2005](https://www.legislation.gov.uk/uksi/2005/1643/made)

Suggested resources (continued)

Legislation (continued)

* [HSE | Hand-fed surface planing machines](https://www.hse.gov.uk/pubns/wis17.pdf)
* [HSE | Vertical spindle moulding machines](https://www.hse.gov.uk/pubns/wis18.pdf)
* [HSE | Safe use of manually operated cross-cut sawing machines](https://www.hse.gov.uk/pubns/wis36.pdf)
* [HSE | Narrow band saws](https://www.hse.gov.uk/pubns/wis31.pdf)
* [HSE | Safe use of power-operated cross-cut saws](https://www.hse.gov.uk/pubns/wis35.pdf)
* [HSE | Tooling for use with hand-fed woodworking machines](https://www.hse.gov.uk/pubns/wis37.pdf)
* [HSE | Retrofitting woodworking machine brakes](https://www.hse.gov.uk/pubns/wis38.pdf)
* [HSE | Reducing noise at woodworking machines](https://www.hse.gov.uk/pubns/wis13.pdf)
* [HSE | Wood dust: Controlling the risk](https://www.hse.gov.uk/pubns/wis23.htm)
* [HSE | Health and safety statistics](https://www.hse.gov.uk/statistics/index.htm)
* [HSE | Working at height: A brief guide](https://www.hse.gov.uk/pubns/indg401.pdf)
* [HSE | Woodworking Publications - Free leaflets](https://www.hse.gov.uk/pubns/woodindx.htm)
* [HSE | Safe use of woodworking machinery](https://www.hse.gov.uk/pubns/books/l114.htm)
* [HSE | Health and Safety at Work Act 1974 explained](https://www.hse-network.com/health-and-safety-at-work-act-1974-explained)
* [HSE | Health and safety in the woodworking industry](https://www.hse.gov.uk/woodworking/index.htm)
* [HSE | Construction Design and Management Regulations 2015](https://www.hse.gov.uk/construction/cdm/2015/index.htm)
* [HSE | PUWER](https://www.hse.gov.uk/work-equipment-machinery/puwer.htm)
* [HSE | RIDDOR](https://www.hse.gov.uk/riddor/)
* [HSE | COSHH](https://www.hse.gov.uk/coshh/)
* [HSE | LOLER](https://www.hse.gov.uk/work-equipment-machinery/loler.htm)

Suggested resources (continued)

Textbooks

* Jones, S., Redfern, S., Fearn, C. (2019) *The City & Guilds Textbook: Site Carpentry and Architectural Joinery for the Level 2 Apprenticeship (6571), Level 2 Technical Certificate (7906) & Level 2 Diploma (6706).* London: Hodder Education.

ISBN 978-1-5104-5813-0

* Burdfield, M., Jones, S., Redfern, S., Fearn, C. (2020) *The City & Guilds Textbook: Site Carpentry & Architectural Joinery for the Level 3 Apprenticeship (6571), Level 3 Advanced Technical Diploma (7906) & Level 3 Diploma*. London: Hodder Education.

ISBN 978-1-5104-5815-4

| **Learning outcomes** | **Criteria** | **Delivery guidance** |
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| 1. Understand resource selection | * 1. Characteristics of the resources | * Learners to identify the main parts of a variety of transportable cutting and shaping machines. * Learners to understand the purpose and limitations of each power tool and associated tooling and to know how to rectify defects within limits of their responsibility. To include: * saws: circular, chop (including compound mitre), table jig, alligator, oscillating (multi-tool), narrow bandsaw * tooling: negative hook, positive hook, neutral hook, Tungsten Carbide Tipped (TCT), plate blade, Teeth per Inch (TPI) * drills (rotary, rotary percussion, drill driver); High-speed Steel (HSS), TCT, Slotted Drive Shaft (SDS) * planer (handheld) and cutting knives * biscuit jointer and its saw blade * domino cutter * disc cutter: cutting, grinding, metal, stone and diamond discs * morticer (portable) and their augers and chisels * portable surface planer thicknesser * sanders (orbital, belt, disc), including graded abrasive papers * router (handheld and inverted in a table) including fluted, fixed pin, ball race, profile, moulding, HSS, TCT and Polycrystalline Diamond (PCD) cutter types * laminate trimmer and their cutters: flute, ball race. * Learners to know the different types of power supply used for the machines above to include 110v, 230v and pneumatic. |
| * 1. Use of resources | * Learners to know how to use the transportable cutting and shaping machines listed in 1.1. * Learners to know how and when to report problems or defects with transportable cutting and shaping machines. |
| * 1. Organisational procedures to select resources | * Learners to know how to access or requisition machines and understand their suitability for tasks. |
| * 1. Hazards | * Learners to understand common hazards and risks - such as projectiles, cutter contact, noise, dust, vibration, electrocution, slips, trips, falls and entanglement, orificial or bodily entry, skin penetration (air/pneumatic supply) - which can be encountered when using cutting machines. * Learners to understand how hazards can be minimised/overcome. * Learners to understand how to access information for the safe use of transportable cutting and shaping machines, including manufacturers’ instructions, Approved Codes of Practice (ACOPs), appropriate legislation e.g., Provision and Use of Work Equipment Regulations 1998 (PUWER), abrasive wheels. |
| 1. Understand working to a contract specification | * 1. Methods of work | * Learners to know how to select and use transportable tools to shape timber and panel products taking into account: reference marks, defects (such as twist, bow, cupping, sloping grain, shaped work) and the size/weight of the component. * Learners to know how to use work piece support equipment e.g., roller and trestle tables. * Learners to know how to use jigs and aids for safe working and accurately producing multiple components (wedged jigs, glue block jigs, saddle boards, jigs, push blocks, push sticks, feather board). * Learners to understand good housekeeping and working in accordance with safety guidance. * Learners to know how to provide temporary storage of stacked components during machining operations. * Learners to know how to store finished components to prevent damage. * Learners to know how each machine is used to cut, profile and shape components for producing site carpentry components. |
| * 1. Tools and equipment | * Learners to know how to: * select appropriate power tools, tooling and equipment for the chosen task * set up power tools and equipment, and change tooling for the chosen task * carry out prestart safety checks * maintain and store power tools, tooling and equipment * set up and maintain Local Exhaust Ventilation (LEV) systems * select the appropriate cutters and collars for proprietary router jigs including stair trenching, hinge and housing jigs. |
| 1. Comply with the given contract information to carry out the work safely and efficiently to the required specification | * 1. Demonstrate work skills to measure, mark out and secure materials for power tool operations | * Learners to know how to use different types of hand and power tools to produce site carpentry components, including: * saws: handheld, track saw, chop, mitre, and compound mitre * drill * planer * biscuit jointer * disc cutter * morticer * thicknesser * sander * router * laminate trimmer. * Learners to know how to set up and use proprietary router jigs, including lock, hinge and worktop jigs. * Learners to know how to select, safely set up, use and maintain the different types of hand tools and power tools with their associated equipment. * Learners to know how to safely isolate different types of hand and power tools and their associated equipment and leave them in a safe condition. |
| * 1. Set up, use and maintain power tools including using at least three of the following powered cutting machines to given working instructions: * saw (at least three from the following: circular, chop, mitre, bench or table, jig, reciprocating, oscillating * drill * planer (hand held and portable surface and thicknesser) * biscuit jointer * disc cutter * morticer   and set up and use at least two of the following powered shaping machines to given working instructions:   * thicknesser * sander (orbital, belt, disc) * router * laminate trimmer |