



National Unit Specification: general information

UNIT Woodmachining: High Speed Router (SCQF level 6)

CODE F7H1 12

SUMMARY

This Unit is suitable for candidates working towards a Modern Apprenticeship in Woodmachining and will develop the candidate's skills in the operation and servicing of the High Speed Router. It will help candidates in selecting cutters and cutting speeds, setting up and operating high speed routers using a range of cutter heads for jig and fence work and to manufacture components to pre determined dimensions, safely and accurately. It is also designed to develop the candidate's underpinning knowledge and understanding of high speed router functions and operation.

OUTCOMES

- 1 Demonstrate knowledge and understanding of high speed router terminology, legislation, functions and the operation of the main parts.
- 2 Identify a range of cutter head types and select suitable cutters and cutting speeds for given operations.
- 3 Set up and operate the high speed router using a range of cutter heads for jig and fence work.
- 4 Maintain, lubricate and clean a high speed router.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates undertaking the Professional Development Award in Woodmachining at SCQF level 6 must meet the requirements of the Modern Apprentices which include being employed in a relevant craft industry.

CREDIT VALUE

1 credit at SCQF level 6 (6 SCQF credit points at SCQF level 6*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Administrative Information

Superclass: TG

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National Unit Specification: general information (cont)

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CORE SKILLS

While there is no automatic certification of Core Skills or Core Skill components in this Unit, opportunities for developing aspects of the following Core Skills are highlighted in Support Notes of this Unit:

- ◆ *Problem Solving* at SCQF level 4
- ◆ *Information and Communication Technology* at SCQF level 3
- ◆ *Numeracy* at SCQF level 4
- ◆ *Communication* at SCQF level 4

National Unit Specification: statement of standards

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Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit Specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

OUTCOME 1

Demonstrate knowledge and understanding of high speed router terminology, legislation, functions and the operation of the main parts.

Performance Criteria

- (a) Correctly define high speed router terminology.
- (b) Identify current health and safety legislation related to high speed routers.
- (c) Correctly annotate the main parts of the machine.
- (d) Correctly identify the function of the main parts of the machine.
- (e) Correctly describe the functions of the machine.
- (f) Correctly identify lubricants and grease used for high speed routers.

OUTCOME 2

Identify a range of cutter head types and select suitable cutters and cutting speeds for given operations.

Performance Criteria

- (a) Correctly identify a range of cutterheads.
- (b) Correctly select cutterheads and cutting speed for given operations.
- (c) Correctly describe the practical applications of the concentric and eccentric chucks.

OUTCOME 3

Set up and operate the high speed router using a range of cutter heads for jig and fence work.

Performance Criteria

- (a) Correctly carry out pre-machining checks and set machine for producing components.
- (b) Correctly use a range of cutterheads.
- (c) Perform operations involving jig and fence work in accordance with a given specification.
- (d) Comply with current health and safety regulations in all work methods and throughout all practical activities.

National Unit Specification: statement of standards (cont)

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OUTCOME 4

Maintain, lubricate and clean a high speed router.

Performance Criteria

- (a) Maintain the machine in accordance with related technical information.
- (b) Lubricate the machine in accordance with related technical information.
- (c) Remove resin from machine parts correctly.
- (d) Clean bolts holes for fence and guard locations correctly.

EVIDENCE REQUIREMENTS FOR THIS UNIT

Evidence is required to demonstrate that the candidates have achieved this Unit to the standard specified within all Outcomes and Performance Criteria. All working practices must be in line with relevant and current Health and Safety legislation and regulations. A risk assessment and method statement must be completed prior to any practical activities taking place.

Written and/or oral evidence is required to show that the candidate has achieved the standards specified in the Performance Criteria in Outcomes 1 and 2 and demonstrates the candidate's knowledge and understanding of technical terminology and legislation relating to high speed routers. Candidates should be able to provide the correct annotation to identify machine parts, define the function of machine parts, describe the function of the high speed router, identify cutterheads from a given range, and select a suitable rpm speed for given operations. Candidates must also define two items of related technology on concentric and eccentric chucks. Evidence for these Outcomes will be obtained by a question paper under closed-book supervised conditions.

Performance evidence supplemented by an assessor observation checklist is required for Outcomes 3 and 4 to show the candidate can meet all Performance Criteria by correctly setting up and manufacturing a minimum of two components produced by the use of jigs and manufacture components using a fence. Candidates must also carry out machine maintenance procedures competently. The candidate will be observed to show that they can select appropriate lubricants, oil can and grease gun before using vacuum equipment, rags and lubricants to maintain the machinery and equipment and the candidate must also report any faults identified during maintenance in accordance with recognised policy. Evidence for these Outcomes must be gathered under controlled supervised conditions.

Candidates work methods and activities must be correct in terms of:

- ◆ sequencing operations
- ◆ minimising wastage of materials
- ◆ satisfying current safety regulations

These Evidence Requirements will be met by the completion of the Training and Assessment Programme (TAP) Woodmachining.

National Unit Specification: support notes

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This part of the Unit Specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

This Unit has been developed as a mandatory Unit in the Professional Development Award in Woodmachining at SCQF level 6, which is a mandatory component of the Modern Apprenticeship.

The successful completion of this Unit will help provide candidates with the required underpinning knowledge of the design and use of the High Speed Router for specific purposes and manufacturing processes including the correct sequencing of operations, working to drawing specifications, maintenance, safe working practices and current health and safety legislation.

This Unit would be offered to candidates from the construction and related industries. The skills are transferable within different working environments but the Unit is primarily aimed at candidates whose normal place of work would be a site, workshop, or similar environment.

The Unit deals with the theory and practice associated with the safe use and maintenance of the high speed router machine and is complemented by Units dealing with related work in machine woodworking. The Unit should be delivered as part of a structured programme of training and orientated to the context of the candidate's work and area of responsibility. It is recommended that candidates should be working towards *Woodmachining: Jig Development and Manufacture* and *Woodmachining: Small Tool Maintenance* at SCQF level 6 before undertaking the practical elements of this Unit.

Health and Safety and Sustainability are integral and key to the Construction Industry therefore throughout the Unit emphasis will be placed where appropriate on the application of Health and Safety and Sustainability. Safe working practices should be looked at in accordance with current safety codes of practice and regulations. Sustainability should include reference to legislation affecting the conservation of the environment and its relevance to this trade and to the construction industry in general. Attention should also be drawn to the dangers of not implementing this legislation.

National Unit Specification: support notes (cont)

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GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Candidates should be given working drawings and specifications. It is recommended that candidates work towards tolerances of ± 0.5 mm for component dimensions and ± 2 mm for complete manufactured work pieces.

Opportunities should be taken throughout delivery of this Unit to meet the requirements of the generic Units of the Training and Assessment Programme including:

- ◆ Conform to Efficient Working Practices
- ◆ Conform to General Workplace Safety
- ◆ Move and Handle Resources
- ◆ Confirm Work Activities and Resources for the Work
- ◆ Develop and Maintain Good Working Relationships
- ◆ Confirm the Occupational Method of Work

The candidate should be introduced to all relevant machinery components, tooling and ancillary equipment through classroom teaching with the use of visual aids, electronic presentations, DVDs, e-learning, reference books, classroom exercises and group discussions. The function of each component should be thoroughly demonstrated. Safe working practice methods should be demonstrated by candidates showing good technique in the measuring, marking out of materials, setting and safe operation of machinery. This teaching approach should help ensure the candidate is acquiring the underpinning knowledge required for the Unit.

Outcome 1

The candidate should be introduced to the terminology related to the functions of the high speed router and the operation of the main parts. The candidate should be made fully aware of the exacting demands required to produce components of high quality. Correct terminology should be used throughout with safe practices being clearly emphasised when investigating the functions of the machine.

Outcome 2

The candidate should be introduced to a comprehensive range of cutter types and reasons for selection. The reasons for selecting suitable cutting speeds for chosen operations should be fully explained. Applications of the concentric and eccentric chuck should be fully explored by practical demonstration, emphasising the need for careful selection.

Outcome 3

The candidate should become competent at setting up and performing operations on the high speed router. It is imperative that safe working practices on the machine are clearly emphasised. The candidate should be provided with appropriate material, a workshop drawing(s) and specification for each component outlining demands of the practical exercise and Performance Criteria.

National Unit Specification: support notes (cont)

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Outcome 4

Guidance on machine maintenance should be given in terms of lubrication, adjustment, cleaning of threaded bolt holes and removal of resin from machine parts. The candidate should be encouraged to fully appreciate the need to refer to machine manufacturer's handbook underlining the importance of maintenance schedules and recommended lubricants.

At the time of writing the following safety requirements apply: HSW (Health and Safety at Work etc.) Act; COSHH (Control of Substances Hazardous to Health) Regulations; PUWER (Provision and Use of Work Equipment Regulations).

OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

The Core Skill of *Problem Solving* could be developed to SCQF level 4 as candidates undertake this Unit. Candidates will need to take account of a range of factors in order to work efficiently and safely, such as the choice of tooling, appropriate materials, safety issues, safety equipment and sustainability.

Opportunities also arise for candidates to develop the Core Skill of *Information and Communication Technology* at SCQF level 3 by the use of spreadsheets for cutting lists and risk assessment, e-learning and e-assessment.

Numeracy at SCQF level 4 could be developed through the interpretation of information from 3 dimensional working drawings and workshop calculations within Outcome 2.

Candidates will have the opportunity to develop *Communication* skills at SCQF level 4 throughout practical tasks, as they should be expected to communicate with others using the correct terminology, tone and style suited to the workplace.

National Unit Specification: support notes (cont)

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GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

The Woodmachining Training and Assessment Programme (TAP) sections 3, 5 and 6 provide detailed assessment material for this Unit. It is advised to use the TAP which has been developed centrally by SQA. Any other instrument of assessment used must be comparable to the TAP and have been through prior verification. It is expected that candidates will be given as much practice as possible, prior to being set the assessment tests.

For Outcomes 1 and 2, an appropriate way to assess the candidates' knowledge and understanding of terminology, legislation, components, functions in relation to the High Speed Router and cutters would be through a series of multiple choice and written question papers conducted under controlled, supervised conditions.

Evidence will be gathered for Outcomes 3, and 4 through observation that the candidates have met the given standards and tolerances during the practical activity. An assessor observation checklist can be used to record this evidence. Assessment should be conducted under controlled, supervised conditions. A suitable task that would allow candidates to demonstrate competence could be high speed router work involved in the manufacture of a Trefoil, CD holder or a bedside cabinet.

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by information and communications technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

DISABLED CANDIDATES AND/OR THOSE WITH ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website

www.sqa.org.uk/assessmentarrangements