



## National Unit Specification: general information

**UNIT** Woodmachining: Toolroom (Cutters) (SCQF level 6)

**CODE** F7H0 12

### SUMMARY

This Unit is suitable for candidates working towards a Modern Apprenticeship in Woodmachining and will develop the candidate's skills in using grinding equipment safely to develop and sharpen straight and shaped cutters. This Unit is also designed to enable candidates to develop their knowledge and understanding of the terminology used relating to the preparation of planing and moulding cutters and cutterblocks and applying technical knowledge of cutting tool geometry.

### OUTCOMES

- 1 Demonstrate knowledge and understanding of safe design and manufacture of cutters.
- 2 Produce straight and shaped cutters.
- 3 Set up cutterblocks.

### 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. It is recommended that the candidate is introduced to four sided moulded machines before undertaking this Unit.

### CREDIT VALUE

1 credit at SCQF level 6 (6 SCQF credit point 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.*

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### 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:

- ◆ *Numeracy* at SCQF level 4
- ◆ *Communication* at SCQF level 4

## **National Unit Specification: statement of standards**

### **UNIT**      Woodmachining: Toolroom (Cutters) (SCQF level 6)

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 safe design and manufacture of cutters.

##### **Performance Criteria**

- (a) Correctly define terminology related to cutters.
- (b) Correctly identify machinery and abrasives used to grind cutters.
- (c) Accurately produce cutter projection drawings.
- (d) Correctly apply projection grids and templates.
- (e) Correctly identify cutter geometry.
- (f) Compile an accurate and legible risk assessment from given technical information relating to grinding and sharpening equipment.

#### **OUTCOME 2**

Produce straight and shaped cutters.

##### **Performance Criteria**

- (a) Accurately grind straight cutters.
- (b) Accurately grind shaped cutters.
- (c) Accurately balance cutters.
- (d) Comply with current health and safety regulations in all work methods and throughout all practical activities.

#### **OUTCOME 3**

Set up cutterblocks.

##### **Performance Criteria**

- (a) Accurately set straight cutters.
- (b) Accurately set moulding cutters.
- (c) Correctly balance cutterblocks.
- (d) Comply with current health and safety regulations in all work methods and throughout all practical activities.

## National Unit Specification: statement of standards (cont)

### UNIT Woodmachining: Toolroom (Cutters) (SCQF level 6)

#### 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 Outcome 1. The candidate must demonstrate knowledge and understanding of technical terminology relating to the selection and safe use of machinery and equipment to produce straight and shaped cutters accurately, this includes grinding, clearance and sharpness angles. Candidates must also develop cutter projection drawings and templates. Evidence for this Outcome will be obtained by a series of question papers under closed-book supervised conditions.

Performance evidence supplemented by an assessor observation checklist is required for Outcomes 2 and 3 to show the candidate can use the projection drawings and templates from Outcome 1 to manufacture set and balance planing and moulding cutters for the production of plain sections, simple and complex mouldings.

The candidate must, on **one** occasion:

- ◆ Set a straight knife grinding machine (or equivalent), grind one pair of knives to balance and hone the knives
- ◆ Accurately manufacture a cutter template for a pre determined moulded section
- ◆ Set up a profile grinding machine to accurately grind a set of shaped cutters to a pre determined geometry which must include side clearance
- ◆ Set up a pedestal grinding machine to accurately hand grind one cutter and one deflector accurately to pre determined geometry

#### Summary of standards and tolerances

Make a grinding template and machine grind a pair of cutters.

- ◆ Template accurate to drawing or sample
- ◆ Cutters should be free from burn marks, burrs and balanced
- ◆ Cutters must display side clearance

Sharpen and hone a pair of straight knives.

- ◆ Grinding angle suitable for machining softwood
- ◆ Cutters should be free from burn marks, burrs, parallel and balanced

## **National Unit Specification: statement of standards (cont)**

### **UNIT**      Woodmachining: Toolroom (Cutters) (SCQF level 6)

Hand grind one cutter and one deflector for chip limitation cutter block.

- ◆ Dimensions of cutter  $\pm 0.5$  mm
- ◆ Grinding angle  $35^\circ$  and relief angle  $10^\circ \pm 1^\circ$
- ◆ Cutters should be free from burn marks, burrs and balanced to correct hand
- ◆ No secondary bevels visible

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

## National Unit Specification: support notes

### UNIT Woodmachining: Toolroom (Cutters) (SCQF level 6)

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 and skills relating to the development of moulding cutters and the grinding to shape and setting of cutters and cutterblocks, 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 toolroom work necessary for the production of planed and moulded sections and is complemented by Units dealing with related work in machine woodworking. Candidates should be working towards Units *Woodmachining: Spindle Moulder* and *Woodmachining: Four Sided Moulder* at SCQF level 6 before attempting to manufacture a grinding template to grind moulding cutters, grind and hone a pair of straight knives and hand grind a pair of cutters. It 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.

Typical range of machinery could be: Straight knife grinder, profile grinder.

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 criteria affecting sustainability, impact of not implementing sustainability on the environment and the legislation promoting sustainability.

#### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

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 setting and safe operation of machinery. This teaching approach should help ensure the candidate is acquiring the underpinning knowledge required for the Unit.

## **National Unit Specification: support notes (cont)**

### **UNIT Woodmachining: Toolroom (Cutters) (SCQF level 6)**

#### **Outcome 1**

The candidate should be introduced to the methods commonly employed in determining the true shape of moulding knives for a given section by geometric drawing, templates and grids together with the required tool geometry for the successful planing and moulding of hardwoods and softwoods.

#### **Outcome 2**

The candidate will be required to grind cutters by hand and machine to meet the Performance Criteria and the planing and moulding machine to be employed. Cutters should be produced for sections such as bevels, rebates, grooves and bolection mouldings.

#### **Outcome 3**

The candidate will be required to set and balance a range of cutters and cutterblocks. Much emphasis should be placed on the balancing of the cutters on the blocks and the detrimental effects of any neglect in this area.

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; Abrasive Wheels Regulations; PUWER (Provision and Use of Work Equipment Regulations).

### **OPPORTUNITIES FOR CORE SKILL DEVELOPMENT**

Numeracy at SCQF level 4 could be developed through the interpretation of information from 3 dimensional working drawings and templates within Outcome 1.

Candidates will have the opportunity to develop the Core Skill of Communication 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.

### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

Section 7 of the Woodmachining Training and Assessment Programme (TAP) provides 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 practise as possible, prior to being set the assessment tasks.

A suitable method of assessing the candidate's knowledge and understanding of terminology to develop the true shape of moulding cutters; grinding and clearance angles, and also the identification of the correct abrasives and machinery used to grind cutter geometries accurately and safely within health and safety guidelines would be through a series of written question papers.

## **National Unit Specification: support notes (cont)**

### **UNIT      Woodmachining: Toolroom (Cutters) (SCQF level 6)**

Candidates will also be required to compile a risk assessment to meet the requirements of Outcome 1

A series of practical activities will allow evidence to be gathered for Outcomes 2, and 3 through observation that the candidates have met the given standards and tolerances. An assessor observation checklist can be used to record this evidence.

#### **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](http://www.sqa.org.uk/assessmentarrangements)