



## Higher National Unit specification

### General information for centres

**Unit title:** Woodmachining: Profile Grinding

**Unit code:** F8RF 34

**Unit purpose:** This Unit is designed to enable candidates to develop their knowledge, understanding and skill in the set up and use of a specialist range of profile cutter-grinding machines using advanced techniques and identify cutting agents used to manufacture a range of cutters which will be used for a range of purposes. This Unit will also enable candidates to utilise the associated tooling and equipment using the full potential of the machine.

On completion of the Unit the candidate should be able to:

- 1 Demonstrate knowledge and understanding of specialist profile grinding machines and their functions.
- 2 Select and prepare tooling and equipment.
- 3 Safely set up a profile grinding machine for production.
- 4 Safely set up and grind profile cutters for profiled work.

**Credit points and level:** 1 HN credit at SCQF level 7: (8 SCQF credit points at SCQF level 7\*)

*\*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.*

**Recommended prior knowledge and skills:** Access to this Unit will be at the discretion of the centre. It would be beneficial if candidates have successfully completed the Professional Development Award (PDA) in Woodmachining at SCQF level 6 (G9FH 46) or have the equivalent level of industrial experience and prior learning.

**Core Skills:** There are opportunities to develop the Core Skills of *Communication, Numeracy, Working with Others* and *Problem Solving* all at SCQF level 5 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

**Context for delivery:** This Unit forms part of the Professional Development Award in Woodmachining at SCQF level 7 and is aimed at candidates following a career in Machine Woodworking and receiving complementary industrial experience. It is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes

## General information for centres (cont)

### Unit title: Woodmachining: Profile Grinding

**Assessment:** This Unit is assessed on the candidate's actual performance of selecting cutters, safely setting up cutterblocks correctly from stock and grind tooling for appropriate production methods. The candidates will also have to show knowledge and understanding in the theory of different types of cutters, costing of cutters including machine time and knowledge of full current regulations in regards to the specialist machine and tooling regulations.

Evidence will be gathered through observation of work processes and assessment of the completed work. Assessment should be carried out under controlled, supervised conditions. In order to achieve this Unit, candidates are required to present sufficient evidence that they have met all the Knowledge and/or Skills elements for each Outcome. Details of these requirements are given for each Outcome.

The assessment instruments used should follow the general guidance offered by the Scottish Qualifications Authority (SQA) assessment model and an integrative approach to assessment is encouraged. Centres may use the instruments of assessment which they consider to be most appropriate but are advised to use the Woodmachining Training and Assessment Programme (TAP) SCQF level 7 which has been developed centrally by SQA. Any other instruments of assessment used must be comparable to the TAP 7.

Accurate records should be made of the assessment instruments used showing how evidence is generated for each Outcome and given marking schemes, checklists and recorded candidate feedback. Records of candidates' achievements should be retained. These records will be made available for external verification.

## Higher National Unit specification: statement of standards

**Unit title:** Woodmachining: Profile Grinding

**Unit code:** F8RF 34

The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

### Outcome 1

Demonstrate knowledge and understanding of specialist profile grinding machines and their functions

#### Knowledge and/or Skills

- ◆ Setting gauges
- ◆ Dial gauges
- ◆ Verniers
- ◆ Micrometers
- ◆ Setting stand
- ◆ Profile grinder
- ◆ Pedestal grinder
- ◆ Various cutter types
- ◆ Templates

#### Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ correctly identify **two** specialist grinding machines illustrating the main design features and stating their functions correctly
- ◆ correctly describe the purpose of the identified machines accessories and setting arrangements

Centres can select two machines and various setting tools from the knowledge and skills list of assessment. Evidence will be gathered under closed-book and supervised conditions.

#### Assessment Guidelines

The candidate could provide oral and/or written evidence using correct technical terminology to identify and describe machine parts, accessories and setting arrangements.

## **Higher National Unit specification: statement of standards (cont)**

**Unit title:** Woodmachining: Profile Grinding

### **Outcome 2**

Selecting and prepare tooling and equipment

#### **Knowledge and/or Skills**

- ◆ Selecting cutter blocks
- ◆ Setting of cutters in cutter block
- ◆ Template design and making
- ◆ Guards and accessories
- ◆ Current legislation

#### **Evidence Requirements**

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ in accordance with current safety legislation correctly set profiled and blank cutters into cutter blocks ready to be ground
- ◆ correctly design, draw and accurately shape template
- ◆ correctly select the correct feed speed in accordance with required finish
- ◆ correctly set all guards and accessories

Evidence can be gathered with aid of practical checklist and under supervised conditions.

#### **Assessment Guidelines**

The candidate will be assessed on actual performance using correct terminology to show knowledge and understanding of factors affecting the setting up of cutters, cutter blocks, designing and shaping appropriate templates to grind new and sharpen existing cutters and the correct use and position of all guards. Evidence could also be in the form of a small written report on the setting up process and responsibilities regarding statutory legislation.

## **Higher National Unit specification: statement of standards (cont)**

**Unit title:** Woodmachining: Profile Grinding

### **Outcome 3**

Safely set up a profile grinding machine for production

#### **Knowledge and/or Skills**

- ◆ Feed speed selection
- ◆ Types of grinding wheel
- ◆ Safety requirements during setting up process
- ◆ Roughing and Finishing grinding wheel
- ◆ Diamond dressing tools
- ◆ Mounting, trueing, shaping
- ◆ Clearance angle, depth of cut

#### **Evidence Requirements**

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can explain importance of surface finish on material and calculate machining and material costs:

- ◆ correctly mount cutters and cutter block with guards in position
- ◆ correctly position template
- ◆ correctly select and test grinding wheel
- ◆ correctly mount and dress grinding wheel

An assessor observation checklist should be completed to ensure that the candidate has met the required specification and tolerances and this observation checklist should be retained as evidence. Evidence must be gathered under controlled, supervised conditions.

#### **Assessment Guidelines**

The candidate will be assessed on actual performance to show knowledge and understanding of factors affecting the setting up of the profile grinder, dressing grinding wheels, correct position of template and the correct use and position of all guards. Evidence could also be in the form of a small written report on the setting up process and responsibilities regarding statutory legislation.

## **Higher National Unit specification: statement of standards (cont)**

**Unit title:** Woodmachining: Profile Grinding

### **Outcome 4**

Safely set up and grind profile cutters for profiled work

#### **Knowledge and/or Skills**

- ◆ Machine operation
- ◆ Side clearance
- ◆ Rough grinding
- ◆ Finish grinding
- ◆ Current Health and Safety Legislation

#### **Evidence Requirements**

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ correctly operate various grinding machinery
- ◆ correctly produce cutters from blanks
- ◆ correctly re-grind existing cutters
- ◆ correctly and accurately finish cutters ready for use on moulding machine

An assessor observation checklist should be completed to ensure that the candidate has met the required specification and tolerances and this observation checklist should be retained as evidence. Evidence must be gathered under controlled, supervised conditions.

#### **Assessment Guidelines**

The candidate will be assessed on actual performance of setting up grinding machines accurately using appropriate grinding wheels with appropriate spindle speed selected to grind cutters to set shape. All guarding must be in position and relevant Personal Protective Equipment (PPE) used. Evidence should be recorded using observation checklists and recorded candidate feedback to ensure that the candidate has met the required standard for this Outcome.

## Administrative Information

**Unit code:** F8RF 34  
**Unit title:** Woodmachining: Profile Grinding  
**Superclass category:** WK  
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### History of changes:

Version	Description of change	Date

**Source:** SQA

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## **Higher National Unit specification: support notes**

### **Unit title: Woodmachining: Profile Grinding**

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 an optional Unit in the PDA in Woodmachining at SCQF level 7. The content and context of this Unit is aimed at candidates who are pursuing a career in the craft of Machine Woodworking.

This Unit has been designed to enable the candidate to develop their knowledge and understanding to enable them to use a range of specialised profiled grinding machines using advanced techniques. In addition the candidate will be able to identify the importance of correctly setting up grinding wheel and cutter blocks with cutters inserted correctly. The successful completion of this Unit the candidate will be able to safely set up and operate specialist profile grinding machines after outlining design details of a range of machines.

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.

Where feasible, centres should also incorporate modern machining methods, tooling, equipment and materials used within the Machine Woodworking industry. Candidates should be made aware of current industry practice and emerging practice or technology which may become conventional in the future.

### **Guidance on the delivery and assessment of this Unit**

As part of the Professional Development Award (PDA) in Woodmachining at SCQF level 7, this Unit may be delivered in a sequence suitable to individual candidates and centres. When completing this Unit as part of the PDA it is recommended that, where possible, opportunity is taken to integrate aspects of Constructional Technical Communication Skills (DW4D 34).

Centres may use the instruments of assessment which they consider to be most appropriate but are advised to use the Woodmachining Training and Assessment (TAP) at SCQF level 7 which has been developed centrally by SQA. Any other instruments of assessment used must be comparable to the TAP 7.



## Higher National Unit specification: support notes (cont)

### Unit title: Woodmachining: Profile Grinding

The candidate should be introduced to all relevant machinery components, tooling and ancillary equipment, grinding wheels, dressing stones, clearance angles, types of cutters and cutter blocks through classroom teaching with the use of visual aids, electronic presentations, DVD's, 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 setting and safe operation of machinery. This teaching approach should help ensure the candidate is acquiring the underpinning knowledge required for the Unit.

Candidates should be given as much practise as possible grinding templates and cutters prior to being set the assessments. Evidence will be gathered through observation that the candidates have met the given standards and tolerances during the production of drawings and practical assessment.

Candidates will be required to demonstrate their knowledge of terminology, techniques and practices by successful completion of knowledge questioning relating to grinding machines along with correct spindle grinding speeds, clearance angles and the identification of various specialist machines, their limitations and components.

Where available, evidence from the workplace can be incorporated to enhance the Outcomes, provided that this evidence is appropriate and authenticated as the candidate's own work. It is the responsibility of the centre to satisfy themselves that the portfolio of evidence submitted for assessment is entirely original and solely the respective student's work.

Candidates could be put through a Abrasive Wheels course which looks at the regulations and fitting of all grinding wheel.

#### *Opportunities for developing Core Skills*

The delivery and assessment of this Unit may contribute towards the Core Skill of *Communication* at SCQF level 5 particularly where the requirement for assessment is in the form of a scaled drawings and knowledge questioning. As candidates complete the practical tasks in Outcome 3 and 4 they will be expected to communicate with others using correct terminology, tone and style suited to the workplace.

There are opportunities to develop the Core Skill of *Numeracy* at SCQF level 5 within Outcomes 2 and 3 where the candidate must complete calculations relating to feed speeds and chip removal. The candidates will also be required to interpret sizes and measurements, read and produce accurate drawings and transfer information accordingly.

The Core Skill of *Working with Others* at SCQF level 5 could also be developed in this Unit in the practical work where candidates may work in pairs. Working with Others involves the ability to work with others to plan, agree, and take responsibility for tasks; to support co-operative working in appropriate ways; and to review the effectiveness of one's own contribution.

The Core Skill of *Problem Solving* at SCQF level 5 could be developed through the choice of tooling, appropriate materials, safety issues, safety equipment and sustainability.

## Higher National Unit specification: support notes (cont)

**Unit title:** Woodmachining: Profile Grinding

### Open learning

Although this Unit could be delivered in part by distance learning, it would require considerable planning by the centre to ensure the sufficiency and authenticity of candidate evidence. Arrangements would have to be made to ensure that:

- ◆ candidates have access to a suitable workshop with suitable equipment and tools
- ◆ health and safety considerations are fully taken into account
- ◆ the practical activities are supervised by a responsible person and clearly recorded (using an assessment checklist for the assessor)
- ◆ the assessor is, at some point, able to question the candidate on that performance
- ◆ assessment is carried out under the stated conditions

For information on open learning arrangements, please refer to the SQA guide *Assessment and Quality Assurance of Open and Distance Learning* ([www.sqa.org.uk](http://www.sqa.org.uk))

### 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)

## General information for candidates

### Unit title: Woodmachining: Profile Grinding

This Unit has been designed to further your career in the timber industry by developing your competence and improving your knowledge of profile grinding machines. It has been written as part of the Professional Development Award (PDA) in Woodmachining at SCQF level 7, and is for experienced crafts persons working in the timber industry as woodmachinists.

The Unit will help develop your underpinning knowledge and skills in the set up and use of a specialist range of planning, moulding and sanding machines using advanced techniques and identify cutting agents used in the manufacture of moulding equipment for a range of purposes.

You will be assessed on your knowledge of identifying specialist planning, moulding and sanding machinery and equipment, costing tooling and materials, sand paper grit and bonds, accurately reproducing cutter development drawings and sketching machines and their functions.

These assessments will take the form of open-book and closed-book and will be supervised. Price lists for tooling and materials will be made available during assessment.

You will also be assessed on the safe set up of planning, moulding and sanding machinery and the manufacture of various components to given dimensions/drawings within the practical workshop through observation.

There are opportunities to develop the Core Skills of *Communication*, *Numeracy*, *Working with Others* and *Problem Solving* all at SCQF level 5 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

If you successfully complete this Unit and the full PDA at SCQF level 7, you will not only have advanced your craft skills, but will also automatically receive some credit for your achievement if you progress on to the HNC Construction.