



Practical Metalworking: Machine Processes (National 4)

SCQF: level 4 (6 SCQF credit points)

Unit code: H25R 74

Unit outline

The general aim of this Unit is to help learners build measuring and marking out skills and to develop skills in using common metalwork machine tools, equipment and related processes. Learners will also develop their knowledge and understanding of metalworking materials, recycling and sustainability issues, as well as an appreciation of safe working practices in a workshop environment.

Learners who complete this Unit will be able to:

- 1 Prepare for metalwork machine process tasks
- 2 Use a range of marking out tools, machine tools and equipment
- 3 Manufacture a metalwork product from working drawings using machine tools and processes

This Unit is a mandatory Unit of the National 4 Practical Metalworking Course and is also available as a free-standing Unit. The Unit Specification should be read in conjunction with the *Unit Support Notes*, which provide advice and guidance on delivery, assessment approaches and development of skills for learning, skills for life and skills for work. Exemplification of the standards in this Unit is given in *Unit Assessment Support*.

The *Added Value Unit Specification* for the National 4 Practical Metalworking Course gives further mandatory information on Course coverage for learners taking this Unit as part of the National 4 Practical Metalworking Course.

Recommended entry

Entry to this Unit is at the discretion of the centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

- ◆ National 3 Practical Craft Skills Course or relevant Units
- ◆ National 3 Design and Technology Course or relevant Units

In terms of prior learning and experience, relevant experiences and outcomes may also provide an appropriate basis for doing this Unit.

Equality and inclusion

This Unit Specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence. For further information, please refer to the *Unit Support Notes*.

Standards

Outcomes and assessment standards

Outcome 1

The learner will:

1 Prepare for metalwork machine process tasks by:

- 1.1 Selecting, with guidance, metalworking tools, equipment, and materials appropriate for tasks
- 1.2 Confirming that metalworking tools and equipment are in good condition and safe working order before, during and after use
- 1.3 Using correct names and terminology when referring to metalworking tools, equipment, materials and processes

Outcome 2

The learner will:

2 Use a range of marking out tools, machine tools and equipment by:

- 2.1 Creating and using datum marks with guidance
- 2.2 Marking out components or workpieces, with guidance, in accordance with working drawings with three functional and two linear sizes to within specified tolerances
- 2.3 Performing drilling and countersinking operations, with guidance, on a pedestal drill to within specified tolerances
- 2.4 Performing parallel turning, facing and chamfering operations on a centre lathe with neatness and consistency of finish
- 2.5 Using tools and equipment, with guidance, safely and correctly

Outcome 3

The learner will:

3 Manufacture a metalwork product from working drawings using machine tools and processes by:

- 3.1 Checking, with guidance, materials supplied against working drawings
- 3.2 Manufacturing, with guidance, a metalwork product with three functional sizes within specified tolerances
- 3.3 Working in accordance with recognised procedures and safe working practices
- 3.4 Carrying out good practice in terms of sustainability and recycling

Assessment standard thresholds

If a candidate successfully meets the requirements of the specified number of Assessment Standards they will be judged to have passed the Unit overall and no further re-assessment will be required.

The specific requirements for this Unit is as follows:

- ◆ 8 out of 12 Assessment Standards must be achieved.

It should be noted that there will still be the requirement for candidates to be given the opportunity to meet all Assessment Standards. The above threshold has been put in place to reduce the volume of re-assessment where that is required.

Evidence Requirements for the Unit

Assessors should use their professional judgement, subject knowledge and experience, and understanding of their learners, to determine the most appropriate ways to generate evidence and the conditions and contexts in which they are used.

Evidence may be presented for individual Outcomes or it may be gathered for the Unit as a whole through integrating assessment holistically in one single activity. If the latter approach is used, it must be clear how the evidence covers each Outcome.

For this Unit, learners will be required to provide evidence of:

- ◆ knowledge and understanding of a range of practical metalworking machine tools, equipment, processes and materials
- ◆ practical skills in using machine tools, equipment, materials and related processes
- ◆ knowledge and understanding of sustainability issues and good practice in recycling in practical metalworking activities and environments
- ◆ the ability to work in accordance with given procedures and safe working practices

It is assumed that the component/workpieces and products in this Unit are readily portable. The tolerances referred to in the Assessment Standards are:

Operation	Tolerance
Marking out	±1mm
Drilling and countersinking	±1mm
Metalwork product: functional size	±0.5mm on diameter ±1mm on linear

The tolerances are also given assuming that available machinery and equipment can reasonably meet these expectations.

Learners at National 4 level are expected to require a reasonable level of guidance and support throughout practical activities.

Exemplification of assessment is provided in *Unit Assessment Support*. Advice and guidance on possible approaches to assessment is provided in the *Unit Support Notes*.

Functional dimension

Any size on a component that **must** be within tolerance or the product will not function or assemble properly. This is particularly important for moving parts.

Development of skills for learning, skills for life and skills for work

It is expected that learners will develop broad, generic skills through this Unit. The skills that learners will be expected to improve on and develop through the Unit are based on SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work* and drawn from the main skills areas listed below. These must be built into the Unit where there are appropriate opportunities.

2 Numeracy

2.2 Money, time and measurement

4 Employability, enterprise and citizenship

4.3 Working with others

5 Thinking skills

5.2 Understanding

5.5 Creating

Amplification of these is given in SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work*. The level of these skills should be at the same SCQF level of the Unit and be consistent with the SCQF level descriptor. Further information on building in skills for learning, skills for life and skills for work is given in the *Unit Support Notes*.

Administrative information

Published: September 2018 (version 1.2)

Superclass: XD

History of changes to National Unit Specification

Version	Description of change	Authorised by	Date
1.1	Fixed formatting page 3 Additional information page 4	Qualification Manager	June 2014
1.2	Assessment standard threshold added.	Qualifications Manager	September 2018

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