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## Practical Metalworking: Machine Processes (National 5)

**SCQF:** level 5 (6 SCQF credit points)

**Unit code:** H25R 75

### 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 5 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 the *Unit Assessment Support*.

The *Course Assessment Specification* for the National 5 Practical Metalworking Course gives further mandatory information on Course coverage for learners taking this Unit as part of the National 5 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 the following or equivalent qualifications and/or experience:

- ◆ National 4 Practical Metalworking Course or relevant Units

## **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 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 Adjusting tools where necessary, following safe working practices
- 1.4 Using correct names and terminology when referring to common metalworking tools, equipment, materials and processes

### Outcome 2

The learner will:

#### **1 Use a range of marking out tools, machine tools and equipment by:**

- 2.1 Correctly creating and using datum marks
- 2.2 Marking out components or workpieces in accordance with working drawings with three functional and two linear sizes to within specified tolerances
- 2.3 Performing drilling and countersinking operations on a pedestal drill to within specified tolerance
- 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 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 materials supplied against working drawings
- 3.2 Manufacturing 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

## 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 specified tolerances referred to in the Assessment Standards are:

Operation	Tolerance
Marking out	$\pm 0.5\text{mm}$
Drilling and countersinking	$\pm 0.5\text{mm}$
Turning, facing and chamfering	$\pm 0.2\text{mm}$
Metalwork product: functional sizes	$\pm 0.2\text{mm}$ on diameter $\pm 0.5\text{mm}$ on linear

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

Exemplification of assessment for this Unit is provided in the *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 part 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**

5.3 Applying

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

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**Published:** June 2014 (version 1.1)

**Superclass:** XD

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## History of changes to National Unit Specification

Version	Description of change	Authorised by	Date
1.1	Additional information added to Evidence requirements for the Unit.	Qualifications Manager	June 2014

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Note: readers are advised to check SQA's website: [www.sqa.org.uk](http://www.sqa.org.uk) to ensure they are using the most up-to-date version of the Unit Specification.

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