

Title	Perform basic mechanical engineering machining operations under supervision		
Level	2	Credits	12

Purpose	People credited with this unit standard are able to: demonstrate knowledge of machining principles and safe working practices; prepare for, and perform, machining operations under supervision; and adjust and maintain machines under supervision.
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Classification	Mechanical Engineering > Engineering Core Skills
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Available grade	Achieved
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Guidance Information

1 References

Health and Safety in Employment Act 1992.

Accident Compensation Corporation and Department of Labour. *Metal Industry Guidelines for Safe Work*. (Wellington: ACC, 2007). Available from

http://www.acc.co.nz/PRD_EXT_CSMP/idcplg?IdcService=GET_FILE&dID=3023&dDocName=PRD.

Occupational Safety and Health Service, *Guidelines for Guarding Principles and General Safety for Machinery* (Wellington: Department of Labour, 1995).

2 Definitions

Industry practice – safe and sound trade practice generally accepted by competent persons within the mechanical engineering industry.

Interpretation – the explanation of features shown graphically in the drawing.

Job specifications – instructions relevant to the safe completion of the specific task, such as technical specifications, assembly instructions, drawings, parts lists, standards, codes of practice, test and commissioning procedures, and verbal instructions.

Safety guidelines – guidelines for the safe operation of machinery and tools, such as those listed in the references, as well as guidelines for specific machines in workshops.

Worksite procedures – operational procedures put in place by the candidate's employer. These include site safety procedures, equipment operating procedures, job procedures, quality assurance, and procedures for the handling and disposal of materials and waste.

3 This is an introductory standard. Production of components by turning, milling, and grinding operations are covered in unit standards 2712, 2714, and 2715. Precision turning, milling and grinding are covered in unit standards 2704, 2717, and 2718.

4 Assessment information

This unit standard is concerned with establishing safe use of machines and proper operational practices, rather than precision machining. Therefore the specification of required machining precision for assessment purposes should take into account the introductory nature of this standard, and the materials and machinery used.

Assessment against this unit standard requires the use of the following machinery:

- machines – drill press, manually controlled lathe, manually controlled milling machine;
- drilling – a selection of small and larger holes in sheet metal, blocks of ferrous and non-ferrous material;
- turning – two of – parting off, cutting grooves, stepped spindles, knurling, drilling;
- milling – at least two of – slotting, keyway, flats, facing, peripheral machining.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of machining principles.

Performance criteria

- 1.1 Machine components are identified and the principles of operation explained in accordance with industry practice.
- 1.2 Different types of drills, and cutting and milling tools, are identified in accordance with industry practice.
- 1.3 The principles of cutting metal using lathes and milling machines are explained in accordance with industry practice.

Range reference to – tool angle, cutting speed, feed speed, cutting fluids.

Outcome 2

Demonstrate knowledge of machining safe working practices.

Performance criteria

- 2.1 Safe working practices relating to the machine operator are outlined in accordance with industry practice and safety guidelines.

Range includes but is not limited to – long hair, loose clothing, footwear, items of adornment, goggles, ear muffs, operator training.

2.2 Safe working practices relating to machines are outlined in accordance with industry practice and safety guidelines.

Range includes but is not limited to – guards, unattended machines left running, emergency stops, chuck keys and collet tightening spanners, tool condition and angle, cutting and feed speeds, security of work piece, cutting fluid.

2.3 Safe working practices relating to materials are outlined in accordance with industry practice and worksite procedures.

Range disposal of waste material, spillages.

2.4 Location of fire extinguishers and emergency exits in the workshop are identified.

Outcome 3

Prepare for machining operations under supervision.

Performance criteria

3.1 Drawings and/or specifications for machining work are interpreted, and tolerances clarified from job specifications.

3.2 Machines are selected and their operating procedures determined in accordance with industry practice and worksite procedures.

3.3 Cutting tools are identified and sharpness confirmed in accordance with industry practice and worksite procedures.

3.4 Workpieces are marked out to meet job specifications in accordance with industry practice, and worksite procedures.

Outcome 4

Perform machining operations under supervision.

Performance criteria

4.1 Tools and workpieces are securely mounted in accordance with industry practice, worksite procedures, and safety guidelines.

4.2 Machining parameters are set in accordance with job specifications and machine operating procedures.

4.3 Machining is performed in accordance with industry practice, worksite procedures, and safety guidelines.

4.4 Machined components are measured to confirm they meet the specified tolerances in accordance with job specifications.

Outcome 5

Adjust and maintain machines under supervision.

Performance criteria

- 5.1 Machines are left clean and ready for next use in accordance with industry practice and worksite procedures.
- 5.2 Blunt drills are sharpened, and the conditions of other blunt or damaged tools are reported to the supervisor in accordance with worksite procedures.
- 5.3 Waste material is disposed of in accordance with worksite procedures.
- 5.4 Routine checks, adjustments, and lubrication are carried out in accordance with industry practice and worksite procedures.

Replacement information	This unit standard was replaced by unit standard 29671 and unit standard 29673.
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This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	22 September 2005	31 December 2016
Review	2	17 November 2011	31 December 2021
Review	3	8 December 2016	31 December 2021
Rollover	4	16 December 2021	31 December 2022

Consent and Moderation Requirements (CMR) reference	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.