Title	**Perform milling and turning operations in mechanical engineering**		
Level	**3**	**Credits**	**10**

Purpose	This unit standard is for general purpose machining across mechanical engineering trades. People credited with this unit standard are able to prepare for, and perform, milling, and turning operations, and verify dimensional accuracy.

Classification	Mechanical Engineering > Engineering Machining and Toolmaking

Available grade	Achieved

Prerequisites	Unit 29650, *Demonstrate knowledge of the safe use of powered equipment in a mechanical engineering or fabrication workshop*, or demonstrate equivalent knowledge and skills.

Guidance Information

1 References
Health and Safety at Work Act 2015.
Accident Compensation Corporation and Department of Labour. *Metal Industry Guidelines for Safe Work*. (Wellington: ACC, 2007). Available from http://www.acc.co.nz.
Culley R. (2010) *Fitting and Machining*. Melbourne, Australia, RMIT Publishing. ISBN 9781921426780.

2 Definitions
Specifications – detail that defines an object being made; commonly communicated by annotated and dimensioned drawings; by written description, or by other communication media. External references may also be used to specify objects such as tables or industry standards.
Workplace procedures – procedures used by the organisation carrying out the work and applicable to the tasks being carried out. Examples are – standard operating procedures, safety procedures, equipment operating procedures, codes of practice, quality management practices and standards, procedures to comply with legislative and local body requirements.

3 Related unit standards
This unit standard is one of a set used for assessing general machining:

- Unit 29671, *Demonstrate knowledge of machining equipment, tools, and principles* (Level 2); an introductory machining knowledge standard for use across mechanical engineering trades.
- Unit 29673, *Apply good work practices when performing basic mechanical engineering machining operations under supervision* (Level 2); an introductory practical machining standard for use across mechanical engineering trades.
- Unit 30281, *Perform milling and turning operations in mechanical engineering* (Level 3); a progressive general purpose unit standard for use across mechanical engineering trades.

Outcomes and performance criteria

Outcome 1

Prepare for milling and turning operations.

Range machines – manually controlled lathe, manually controlled milling machine; turning – turning diameter, turning length, taper turning using compound slide, cutting grooves, drilling, parting off, external V form thread, tap and die; milling – slots, drilling, facing, end milling;
machining tolerances using mill or lathe – diameter +/-0.05mm, linear +/-0.1mm.

Performance criteria

1.1 Drawings, instructions, and specifications are interpreted to establish job requirements.

1.2 Tools are selected in accordance with job requirements.

1.3 Speeds and feeds are selected relevant to machine, material, and tooling.

1.4 Sequence of operations is planned to achieve job requirements efficiently, in accordance with workplace procedures.

1.5 Planning includes consideration of equipment and component care, damage minimisation, and required quality in accordance with job requirements.

Outcome 2

Perform milling and turning operations.

Range operations covered in the range for outcome 1.

Performance criteria

2.1 Machine coolant type is selected, and flow is adjusted as required by machine and machining operations.

2.2 Components are machined and finished in accordance with specifications.

2.3 Machine is cleaned and waste material disposed of in accordance with workplace procedures.

Outcome 3

Verify machining accuracy.

Range machining tolerances using mill or lathe – diameter +/-0.05mm, linear +/-0.1mm; components milled for outcome 2.

Performance criteria

3.1 Components are measured using appropriate instruments to confirm specifications.

3.2 Measurements are recorded in accordance with workplace procedures.

Planned review date	31 December 2022

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	20 July 2017	N/A

Consent and Moderation Requirements (CMR) reference	0013

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.