

Title	Demonstrate and apply knowledge of manufacturing processes and equipment for mechanical engineering		
Level	5	Credits	15

Purpose	People credited with this unit standard are able to: select mechanical engineering manufacturing processes for metal products; select mechanical engineering manufacturing processes for plastic products; select, and inspect for safety, equipment and tooling to support mechanical engineering manufacturing processes; and identify hazards and their management.
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Classification	Mechanical Engineering > Applied Principles of Mechanical Engineering
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Available grade	Achieved
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Explanatory notes

- 1 References
Health and Safety at Work Act 2015 and supporting Regulations.
- 2 Definitions
Accepted industry practice refers to approved codes of practice and standardised procedures accepted by the wider mechanical engineering industry sectors as examples of best practice.
Workplace procedures refer to procedures used by the organisation carrying out the work and applicable to the tasks being carried out. They may include but are not limited to – 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 Range
 - a For metal products:
Casting must include – rotary, die, centrifugal, sand, shell;
Machining must include – turning, milling, grinding, rolling, spinning, electro discharge machining, laser machining;
Forging must include – drop, press, stamp;
Fabrication must include – pressing, folding, welding, cutting, press forming;
Rolling must include – hot, cold;
Extrusion must include – forward, reverse, impact;
Surface finishing must include – painting, polishing, plating
 - b For plastic products:
Moulding must include – compression, transfer, injection, blow, rotational.

4 Assessment information

Numerous reference texts and training manuals on manufacturing processes and equipment are available and may be used; however, no one textbook or source of information is envisaged. All activities must comply with applicable workplace procedures and must be consistent with accepted industry practice.

Outcomes and evidence requirements

Outcome 1

Select mechanical engineering manufacturing processes for metal products, and identify hazards and their management plans.

Range processes – casting, machining, forging, fabrication, rolling, extrusion, surface finishing;
evidence is required for one of each process and for one combination of processes.

Evidence requirements

1.1 Processes are selected to meet product specifications.

Range product specifications may include but are not limited to – material, tolerances, strength, ductility, finish.

1.2 Potential hazards to personnel, product, and plant are identified, and actions to control these hazards are described in accordance with relevant legislative requirements.

Outcome 2

Select mechanical engineering manufacturing processes for plastic products, and identify hazards and their management plans.

Range processes – blending, compounding, moulding, extrusion, sheet forming, composites;
evidence is required for one of each process and for one combination of processes.

Evidence requirements

2.1 Processes are selected to meet product specifications.

Range product specifications may include but are not limited to – material, tolerances, strength, finish.

2.2 Potential hazards to personnel, product, and plant are identified, and actions to control these hazards are described in accordance with relevant legislative requirements.

Outcome 3

Select, and inspect for safety, equipment and tooling to support mechanical engineering manufacturing processes and associated safety.

Range processing of metal products and plastic products.

Evidence requirements

3.1 Equipment and tooling is selected to enable products to be manufactured to specifications.

Range specifications may include but are not limited to – material, tolerances, strength, ductility, finish.

3.2 Selected equipment is categorised in terms of their functions.

Range metals category – removal, forming, fabrication, finish;
plastics category – moulding, extrusion, sheet forming, composite.

3.3 Selected equipment and tooling are inspected for safety and environmental protection requirements.

Replacement information	This unit standard replaced unit standard 11397.
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Planned review date	31 December 2021
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 October 2005	31 December 2016
Rollover	2	19 March 2010	31 December 2021
Review	3	20 October 2016	N/A

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>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMRs). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

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.