

Title	Demonstrate and apply knowledge of common metal forming defects and quality control		
Level	3	Credits	5

Purpose	<p>This unit standard is designed to give operators the knowledge and skills required to recognise common defects and to ensure product quality at all stages of the metal forming process.</p> <p>People credited with this unit standard are able to: demonstrate knowledge of metal forming defects; metal forming quality control standards; and identify metal forming defects.</p>
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Classification	Mechanical Engineering > Metal Forming
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Available grade	Achieved
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Guidance Information

- 1 References and legislation

Health and Safety at Work Act 2015 and supporting regulations.
 Hazardous Substances and New Organisms Act 1996.
 Resource Management Act 1991.
 WorkSafe New Zealand. *Health and Safety Guidelines on the Management of Hazards in the Metal Casting Industry*. Available at:
<http://www.business.govt.nz/worksafe/information-guidance/all-guidance-items/metal-casting-industry-health-and-safety-guidelines-for-the-management-of-hazards-in/metal-casting-hs-guidelines.pdf>.
- 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.

Metal forming refers to the metalworking process of fashioning metal parts and objects through mechanical deformation such as sand casting, die casting, investment casting, continuous casting, centrifugal casting, forging, extrusion, three-dimensional additive metal manufacturing.

Workplace procedures refer to the 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 Range

Examples of defects common to various metal forming processes are – surface defects, flow defects, porosity, inclusions, flashing, cracks and tears, malformed product.

4 Assessment information

- a All activities must comply with applicable workplace procedures and must be consistent with accepted industry practice.
- b Evidence provided for assessment against this unit standard must be within the context of metal formed product.
- c Operators need to be able to recognise common defects to ensure product quality at all stages of the manufacturing process. Product defects caused by the metal forming process may become apparent at different stages of manufacture as a result of other processes, e.g. chemical pre-treatment, or machining. At this level operators are not required to identify the specific cause of the defect or know how to rectify faults in machinery or procedure.

Outcomes and performance criteria**Outcome 1**

Demonstrate knowledge of metal forming defects.

Performance criteria

- 1.1 Common defects which may occur in the metal forming processes are described.

Range at least five different defect types.
- 1.2 Defects are described using accepted industry terminology.

Outcome 2

Demonstrate knowledge of metal forming quality control standards.

Performance criteria

- 2.1 Defects are described in terms of compliance with product quality requirements.
- 2.2 Product quality measures are described for metal formed products.

Range examples are – dimensional, visual, sample comparison, specific customer standards and specifications.

Outcome 3

Identify metal forming defects.

Performance criteria

3.1 Inspection procedures are followed for metal products.

Range examples are – visual check of first-off product, periodic sample checks, checks against samples, 100% checks. Evidence of two is required.

3.2 Defects are identified in accordance with quality requirements.

Range examples are – dimensional, visual, sample comparison, specific customer standards and specifications.

3.3 Non-compliant product is identified, segregated, quarantined, and reported.

Planned review date	31 December 2022
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 December 2002	31 December 2012
Review	2	19 May 2006	31 December 2016
Rollover and Revision	3	17 November 2011	31 December 2018
Review	4	15 September 2016	31 December 2022
Review	5	17 August 2017	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>.

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.