

Title	Work safely with molten metals		
Level	2	Credits	3

Purpose	People credited with this unit standard are able to: describe the principles of personal and job safety in working with molten metal; demonstrate safe practices when working with molten metal; and describe methods for dealing with spillage or an emergency.
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Classification	Mechanical Engineering > Metal Forming
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Available grade	Achieved
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Guidance Information

- Unit 21911, *Demonstrate knowledge of safety on engineering worksites*; and Unit 21912, *Apply safe working practices on an engineering worksite* are recommended for entry into this unit standard.
- 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>.
Guidelines for Handling Molten Aluminium. Washington: The Aluminium Association Inc, 3rd ed. 2002.
- 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 creating metal parts and objects through, for example 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.

4 Assessment Information

All activities must comply with applicable workplace procedures and must be consistent with accepted industry practice.

Outcomes and performance criteria

Outcome 1

Describe the principles of personal and job safety in working with molten metal.

Performance criteria

1.1 The hazards associated with radiant heat are described.

1.2 The hazards associated with the melting of metals are described.

Range may include but is not limited to – molten metal and moisture, pre-heating, furnace charging, splash, fumes, mould coating, extreme explosive characteristics of molten aluminium and molten magnesium.

1.3 The hazards associated with the transportation of molten metals are described.

Range transportation equipment may include but is not limited to – cranes, hoists, manual handling, ladle equipment, safety mechanisms, hand shanks.

1.4 The hazards associated with accidental spills are described.

Range may include but is not limited to – sampling methods, condition of refractories, lining inspection.

Outcome 2

Demonstrate safe practices when working with molten metal.

Performance criteria

2.1 Personal Protective Equipment (PPE) is used.

Range may include but is not limited to – glasses, goggles, or visors; woollen clothing; head protection; gloves; foundry boots; spats.

2.2 Pre-heating of equipment and furnace charging are demonstrated.

2.3 Methods to avoid moisture contact with molten metal are demonstrated.

2.4 Safe transportation and manual handling techniques are demonstrated.

Outcome 3

Describe methods for dealing with spillage or an emergency.

Performance criteria

- 3.1 The containment methods for spills are described.
- Range may include but is not limited to – sampling methods, condition of refractories, lining inspection.
- 3.2 The emergency shutdown for furnaces and other equipment is described.
- 3.3 The procedures in the event of personal injury, fire, and accident are described.

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	25 October 1994	31 December 2012
Revision	2	14 April 1997	31 December 2012
Revision	3	5 January 1999	31 December 2012
Review	4	19 October 1999	31 December 2012
Review	5	21 February 2005	31 December 2012
Review	6	19 May 2006	31 December 2016
Rollover and Revision	7	17 November 2011	31 December 2018
Review	8	15 September 2016	31 December 2022
Review	9	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.