



Australian Government

MEM04007 Pour molten metal

Release: 1

MEM04007 Pour molten metal

Modification History

Release 1. Supersedes and is equivalent to MEM04007B Pour molten metal

Application

This unit of competency defines the skills and knowledge required to manually pour molten metal as part of metal casting and moulding processes.

Where the selection and use of engineering measuring equipment is required unit MEM12023 Perform engineering measurements should also be selected.

Where the selection and use of tools is required unit MEM18001 Use hand tools and unit MEM18002 Use power tools/hand held operations, should also be selected as appropriate.

Where lifting and moving of ladles requires the use of overhead cranes, applicable units should also be selected.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Band: A

Unit Weight: 4

Pre-requisite Unit

MEM11011	Undertake manual handling
MEM13004	Work safely with molten metals/glass
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information

Competency Field

Casting and moulding

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
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1	Determine job	1.1	Follow standard operating procedures (SOPs)
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Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
	requirements	1.2	Comply with work health and safety (WHS) requirements at all times
		1.3	Use appropriate personal protective equipment (PPE) in accordance with SOPs
		1.4	Identify job requirements from specifications, job sheets or work instructions
2	Prepare for pouring molten metal	2.1	Select equipment as required
		2.2	Check the condition of the mould and ladle according to procedures
		2.3	Check the temperature of molten metal for conformance to specification
		2.4	Sequence pouring method to procedures
		2.5	Identify the capacity of the required pour against specification
		2.6	Preheat and prepare the ladle to receive molten metal
3	Transfer ladle to furnace	3.1	Check safety clips in accordance with safety procedures
		3.2	Fill and transfer the ladle to the pouring area
		3.3	Determine additives from specification and add to molten metal as required
4	Maintain quality of metal as required	4.1	Remove slag and/or dross where necessary
		4.2	Monitor the temperature as required
		4.3	Undertake chemical analysis and apply remedial action as required
5	Pour molten	5.1	Inform personnel in the immediate area of the metal pour

Elements describe the essential outcomes.

metal

Performance criteria describe the performance needed to demonstrate achievement of the element.

that pour is to take place

5.2 Pour metal safely to specification

5.3 Pour metal at an appropriate and continuous rate

5.4 Pour a test bar as required

6 **Empty excess metal from ladle and return ladle**

6.1 Pour and tag pigs

6.2 Empty, clean and maintain the ladle according to SOPs

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Ladle includes one (1) or more of the following:

- lip pour
- tea pot
- bottom pour
- barrel
- bull ladles of varying capacity

Additives include one (1) or more of the following:

- alloys
- inoculants
- spheroidisers
- coagulants

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM04007 Pour molten metal

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications, SOPs and standard test data sheets
- preparing manual pour of molten metal, including selecting equipment as required, and checking condition of mould and appropriate ladle
- checking temperature of molten metal for conformance against specification, sequencing pouring method and identifying the capacity of the required pour
- transferring ladle to furnace after preheating/preparing to receive molten metal
- filling and transferring the ladle to the pouring area in a safe and effective manner and adding additives as required to molten metal
- maintaining quality of metal by removing slag/dross, monitoring temperature and undertaking chemical analysis and applying any remedial action
- pouring molten metal safely at an appropriate and continuous rate after informing personnel in immediate area that a pour is to take place to required specifications, pouring a test bar as required
- emptying excess metal and cleaning and maintaining ladle.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- types and pouring characteristics of metals
- types and characteristics of ladles
- procedures for maintaining condition and integrity of ladle
- procedures for safe handling and transference of molten metal
- metal treatments, applications and procedures for making additions to molten metal
- slag and dross removing procedures
- techniques for sampling and testing molten metal
- pouring procedures
- metal identification and tagging procedures.

Assessment Conditions

- Assessors must:
 - have vocational competency in pouring molten metal at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

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