



Australian Government

MEM04024 Produce moulds and cores by hand

Release: 2

MEM04024 Produce moulds and cores by hand

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM04024 Produce moulds and cores by hand (Release 1).

Release 1. Supersedes but is not equivalent to MEM04005C Produce moulds and cores by hand (jobbing).

Application

This unit of competency defines the skills and knowledge required to use manual (jobbing) methods to produce moulds and cores to specifications for the production of metal castings. It includes the ability to match patterns to job specifications.

Where the selection and use of welding skills is required unit MEM05012 Perform routine manual metal arc welding and unit MEM05050 Perform routine gas metal arc welding, should also be selected as appropriate.

Where lifting and moving moulds and cores requires the use of mobile load shifting equipment or overhead cranes, appropriate manual handling 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
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM18001	Use hand tools

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.

- | | | | |
|---|---|-----|---|
| 1 | Determine job requirements | 1.1 | Follow standard operating procedures (SOPs) |
| | | 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 |
| | | 1.5 | Determine sequence of operations, including material selection, job set up, for maximum safety, efficiency and to meet job specifications |
| | | | |
| 2 | Select inspect and prepare pattern equipment | 2.1 | Identify pattern and associated equipment from specifications |
| | | 2.2 | Inspect pattern equipment for conformance to specifications, and identify damaged patterns for repair or replacement |
| | | 2.3 | Assemble pattern to specification |
| | | 2.4 | Set up pattern equipment to specification |
| | | | |
| 3 | Make mould and core | 3.1 | Position core in prints utilising chaplets and chills, as required, and vent to specification |
| | | 3.2 | Close mould and check for compliance to component specification |
| | | 3.3 | Select and position appropriate moulding/core making equipment |
| | | 3.4 | Select and use appropriate moulding media to produce mould and core to specification |
| | | 3.5 | Secure mould |
| | | 3.6 | Select or manufacture pouring basin to specification and |

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position in accordance with procedures

- 3.7 Ram up flat back and split pattern moulds and cores with single joints as required
- 3.8 Use parting and stripping systems
- 3.9 Position and secure vents, risers and runners as required
- 3.10 Remove pattern from mould and core box safely and without causing damage to the pattern
- 3.11 Inspect and repair mould as required
- 3.12 Clean and paint mould and core according to specification using site procedures

4 **Complete work requirements**

- 4.1 Leave the worksite in a safe state, including clearing all materials/debris and cleaning the worksite
- 4.2 Dispose of unwanted treated sand according to SOPs
- 4.3 Complete reports/records in accordance with 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.

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

- binders
- hardeners
- sand additives
- mould coatings

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

- flatback
- double sided plated patterns
- split patterns
- cored patterns
- single sided drag and cope plated patterns

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

- flatback/split
- cored moulds
- plated moulds

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

- full
- half
- segment

Mould securing methods include one (1) or more of the following:

- weights
- clamps
- bolting

Moulding media includes one (1) or more of the following:

- green sand
- shell sand
- chemically bonded media

Pouring basins include one (1) or more of the following:

- hand
- pattern formed

Parting and stripping systems include one (1) or more of the following:

- dry
- wet

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 MEM04024 Produce moulds and cores by hand

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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
- planning the production of moulds and cores by hand, including identifying job requirements and materials from instructions or specifications, job set up, and sequence operations for maximum safety and efficiency
- assembling pattern to specification, including selecting, inspecting and setting up pattern equipment to conformance and identifying damaged patterns for repair or replacement
- preparing to produce moulds and cores by positioning core in prints utilising chaplets and chills and vent to specification, closing mould, selecting and positioning appropriate moulding/core making equipment, selecting appropriate moulding media and securing mould
- producing mould and core by selecting or manufacturing a pouring basin, ramming mould and cores with flat joints, using parting and stripping systems, positioning and securing loose pieces, vents, risers and runners, and removing pattern and loose pieces from mould and core box
- inspecting, cleaning, repairing and painting mould according to specification
- disposing of unwanted treated sand according to legislative requirements and SOPs
- completing all proformas and standard workplace forms as required.

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)
- metal casting process
- pattern types and their application in a casting process
- pattern assembly techniques
- procedures for selecting a moulding box to match job and pattern
- principles and processes for selection of ancillary components

- sand types and their bonding systems
- compaction processes
- parting and stripping systems
- mould requirements including vents, runners, risers and other methoding requirements
- finishing and closing techniques
- core placement
- pouring requirements
- securing systems
- pattern care and storage
- environmental requirements.

Assessment Conditions

- Assessors must:
 - have vocational competency in producing moulds and cores by hand 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.
- Assessment must occur in a functioning workplace. Where assessment in the workplace would be unsafe, impractical or threatens the environment, assessment must occur in a sufficiently rigorous simulated environment that reflects the circumstances that would be experienced in a functioning workplace. Assessment must cover all aspects of workplace performance, including 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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