



Australian Government

MEM04011 Produce polymer patterns

Release: 2

MEM04011 Produce polymer patterns

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM04011 Produce polymer patterns (Release 1).

Release 1. Supersedes and is equivalent to MEM04011B Produce polymer patterns.

Application

This unit of competency defines the skills and knowledge required to design, manufacture and finish polymer patterns.

It applies to the manufacture of investment casting dies and polymer patterns for medium production castings, core boxes, tooling aids and jigs and checking of fixtures.

Construction includes solid polymer, filled, laminated fibreglass or metal inserts.

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

Band: A

Unit Weight: 8

Pre-requisite Unit

MEM07005	Perform general machining
MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12023	Perform engineering measurements
MEM12024	Perform computations
MEM13003	Work safely with industrial chemicals and materials
MEM13004	Work safely with molten metals/glass
MEM13015	Work safely and effectively in manufacturing and engineering
MEM14006	Plan work activities
MEM16006	Organise and communicate information
MEM18001	Use hand tools

MEM18002

Use power tools/hand held operations

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, drawings, job sheets or work instructions
2	Inspect and prepare patterns and cores	2.1	Inspect patterns or cores for appropriate surface finish and set up on jointline or flat board to specification
		2.2	Select appropriate parting agent and apply to polymer specifications
3	Manufacture moulds, patterns and tooling aids	3.1	Select appropriate polymer materials to specification
		3.2	Mix polymer and hardener to correct ratios and specifications using standard safety and operating procedures
		3.3	Apply polymer to specification and use predetermined methods, ensuring that air is not entrapped in application, excessive heat is not generated and delamination does not occur in final use
		3.4	Strip, inspect, clean and repair pattern/core box as required

Elements describe the essential outcomes.

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

- 3.5 Machine and finish faces of polymer pattern to specifications
- 3.6 Apply appropriate method of location to patterns and core boxes
- 3.7 Check polymer tooling for conformance to specifications as required

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.

Surface finish includes one (1) or more of the following:

- texture
- gel coat
- aluminium fill

Parting agent includes one (1) or more of the following:

- wax
- PVA

Polymer materials include one (1) or more of the following:

- epoxy resins
- urethane

Method of location includes one (1) or more of the following:

- male and female joint
- pin and bush

Unit Mapping Information

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Links

The MEM Metal and Engineering Training Package Companion Volume Implementation Guide is available from VETNet -

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

Assessment Requirements for MEM04011 Produce polymer patterns

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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, drawings, technical sketches and customer requirements in producing polymer patterns
- preparing to produce polymer patterns by inspecting patterns and cores for appropriate surface finish, and setting up jointline or flat board to specifications
- undertaking numerical operations, geometry and calculations/formulae, including determination of contraction rates
- selecting and mixing the appropriate polymer materials and hardener to correct ratios and proportions in a safe and effective manner
- applying polymer to specification ensuring air is not trapped, excessive heat is not generated and delamination does not occur in final use
- machining and finishing faces of polymer pattern to specifications
- applying method of location to patterns and core boxes
- carrying out maintenance and repairing of pattern/core box 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)
- machining for patternmaking
- parting agents
- methods of locating patterns and core boxes
- range of surface finishes
- range of polymers and their applications
- mixing ratios and calculations
- characteristics of polymer under exothermic reaction and associated control measures
- methods of stripping

- pattern checking techniques.

Assessment Conditions

- Assessors must:
 - have vocational competency in producing polymer patterns 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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