



Australian Government

MEM04038 Produce polymer patterns

Release: 1

MEM04038 Produce polymer patterns

Modification History

Release 1. Supersedes and is equivalent to MEM04011 Produce polymer patterns (Release 2).

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

MEM07032 Use workshop machines for basic operations

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	Performance Criteria
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<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
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
2. Inspect and prepare patterns or cores	2.1 Inspect patterns or cores for appropriate surface finish and set up on joint line or flat board to specification 2.2 Select and apply appropriate parting agent to specifications
3. Manufacture moulds, patterns and tooling aids	3.1 Select appropriate polymer materials to specifications 3.2 Mix polymer and hardener to correct ratios and specifications using manufacturer safety guidelines and standard operating procedures (SOPs) 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 or core box to specifications 3.5 Machine and finish faces of polymer pattern to specifications 3.6 Apply appropriate method of location to patterns or core boxes 3.7 Check polymer tooling for conformance to specifications

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

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.

<i>Specifications include one</i>	drawings
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<i>or more of the following:</i>	• job sheets • work instructions.
Surface finish includes one or more of the following:	• texture • gel coat • aluminium fill.
Parting agent includes one or more of the following:	• wax • polyvinyl acetate (PVA).
Polymer materials include one or more of the following:	• epoxy resins • urethane.
Method of location includes one or more of the following:	• male and female joint • pin and bush.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM04011 Produce polymer patterns (Release 2).

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 MEM04038 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 and include: ·

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications and customer requirements in producing polymer patterns
- preparing to produce polymer patterns by inspecting patterns or cores for appropriate surface finish, and setting up joint line or flat board to specifications
- undertaking numerical operations, including use of geometry and determination of contraction rates
- selecting and mixing the appropriate polymer materials and hardener to correct ratios and proportions in a safe and effective manner on at least two occasions
- applying polymer on at least two occasions to specifications, 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 on at least two occasions
- applying method of location to patterns or core boxes
- carrying out maintenance and repair of patterns or core boxes.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

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 or core boxes
- types of surface finishes
- types 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.
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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.
- 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 that 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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