



Australian Government

MEM04041 Develop and manufacture production patterns

Release: 1

MEM04041 Develop and manufacture production patterns

Modification History

Release 1. Supersedes and is equivalent to MEM04014 Develop and manufacture production patterns (Release 2).

Application

This unit of competency defines the skills and knowledge required to manufacture metal patterns, master patterns, core boxes and associated equipment, including cast plates made directly or from a master pattern.

Patterns may be integral with the plate or mounted to the plates with gating, and depending upon specifications, production core boxes may also be loose or mounted into core box rigs.

Where the manufacture of polymer production patterns is required, unit MEM04038 Produce polymer patterns should also be selected.

Where the selection and use of precision measurement is required, unit MEM12003 Perform precision mechanical measurement should also be selected.

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

Band: A

Unit Weight: 8

Pre-requisite Unit

MEM04039 Assemble plated patterns

MEM04018 Perform general woodworking machine operations

MEM07005 Perform general machining

MEM09002 Interpret technical drawing

MEM11011 Undertake manual handling

MEM12006 Mark off/out (general engineering)

MEM12023 Perform engineering measurements

MEM12024 Perform computations

MEM12026 Perform advanced trade calculations in a manufacturing, engineering or related environment

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
<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. Prepare to undertake work	2.1 Develop and plan pattern and design with reference to customer specifications for number, layout, runner system and core box design 2.2 Interpret and visualise pattern design from drawings, prints or plans and check against customer requirements 2.3 Develop a plan for the sequence in manufacture of a foundry production pattern
3. Develop pattern equipment	3.1 Select and obtain appropriate materials to meet requirements of strength, durability and component finish 3.2 Perform calculations appropriate to establishing pattern parameters
4. Manufacture production patterns and core boxes	4.1 Select appropriate machines and machining process to shape and produce production patterns and core boxes to specifications 4.2 Select and use hand and hand-held power tools to fashion and manufacture production patterns and core boxes to specifications 4.3 Check production patterns and core boxes conform to specifications and requirements

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 or more of the following:</i>	• drawings • job sheets • work instructions.
Materials include one or more of the following:	• ferrous • nonferrous • alloy.
Calculations include one or more of the following:	• angles • tapers • clearances • contraction rates.
Machines include one or more of the following:	• lathes • milling machines • grinders • pedestal drills • pantographs.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM04014 Develop and manufacture production 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 MEM04041 Develop and manufacture production 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
- designing and planning pattern by interpreting customer specifications (verbal or written) for number, layout, runner system and core box design
- developing a plan for sequence of manufacture for a low or high volume on at least two occasions
- developing pattern equipment by selecting and obtaining appropriate materials on at least two occasions
- undertaking mathematical calculations
- selecting and using appropriate machines, machining process and hand and power tools to shape, produce, fashion and manufacture production patterns and core boxes to specifications on at least two occasions
- checking production patterns and core boxes against specifications and requirements.

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)
- characteristics of metals and alloys and their application in the development and manufacture of production patterns
- tolerances and contraction rates typically used in the manufacture of production patterns
- production moulding and casting techniques
- tooling required for casting and moulding
- methoding techniques
- use and application of jigs and fixtures
- methods of construction including machining provision and clamping arrangements
- techniques, tools and equipment to measure, mark out and produce production patterns

- formulae and mathematical techniques required for manufacturing production patterns and core boxes, including contraction, taper, clearances and machining allowances
- identification coding and numbering
- pattern checking techniques
- mouldability including surface finish, face taper, convex or concave perspectives and undercuts.
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Assessment Conditions

- Assessors must:
 - have vocational competency in the development and manufacture of production 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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