



Australian Government

MEM04010 Develop and manufacture wood patterns

Release: 2

MEM04010 Develop and manufacture wood patterns

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM04010 Develop and manufacture wood patterns (Release 1).

Release 1. Supersedes and is equivalent to MEM04010B Develop and manufacture wood patterns.

Application

This unit of competency defines the skills and knowledge required to develop and manufacture all types of solid, split and turned wood patterns and wood pattern component parts, including general engineering and master patterns.

Patterns are constructed by laminating timber and timber composites, stave and lag, box or frame construction or any alternative method that minimises timber shrinkage, warp and achieves required. Solid patterns are set up on a regular or irregular joint. Turned patterns are manufactured using tools and machines appropriate for shaping wood.

Where patterns are required to be set up on pattern plates then unit MEM04012 Assemble plated patterns should also be selected.

Where the development and manufacture of marine propellers, conveyor screws and cast gears is required unit MEM04017 Develop and manufacture gear, conveyor screw and propeller 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.

This unit should not be selected when unit MEM18014 Manufacture press tools and gauges has already been selected.

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

Band: A

Unit Weight: 20

Pre-requisite Unit

MEM04018	Perform general woodworking machine operations
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 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	Develop and lay out wood patterns	2.1	Determine type of wood pattern required through application of moulding/casting techniques and foundry processes
		2.2	Select appropriate timber/timber composites to meet specification

Elements describe the essential outcomes.

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

		2.3	Calculate pattern parameters to specification e.g. angles, tapers, clearances and contractions
		2.4	Lay out pattern showing tapers, machining allowances, core prints and method of construction to specification
		2.5	Develop and manufacture jigs and fixtures to aid wood pattern manufacture as required
3	Manufacture wood patterns	3.1	Mark out materials and develop construction to meet specification
		3.2	Produce pattern or pattern component parts to size and shape using acceptable wood patternmaking techniques, tools, equipment and procedures
		3.3	Check pattern or pattern component parts for conformance to specifications
		3.4	Join and fix pattern component parts to meet specifications
		3.5	Mark, colour code or tag pattern to specifications or 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.

Master patterns include one (1) or more of the

- multiple contraction
- skeleton

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following:

- frame and strickle
- wheels
- pulleys
- chain sheaves
- impellers

Moulding/casting techniques includes:

- a variety of sand moulding techniques and sand mediums

Timber/timber composites include one (1) or more of the following:

- hardwood
- softwood
- laminates
- plywood
- veneers
- bonded fibreboard

Joining and fixing includes one (1) or more of the following:

- glued
- screwed
- nailed
- stapled

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 MEM04010 Develop and manufacture wood 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 to develop wood patterns
- determining type of wood pattern required through application of moulding/casting techniques and selecting the appropriate timber/timber composites to meet requirements
- preparing patterns for manufacture using the appropriate mathematical calculations for angles, tapers, clearances and determination of contraction rates
- laying out pattern showing tapers, machining allowances, core prints and method of construction
- manufacturing jigs and fixtures as required
- marking out and manufacturing all types of solid, split and turned wood patterns and wood pattern component parts using appropriate hand and power tools
- joining and fixing pattern components as required and checking conformance to specification
- marking, colour coding or tagging pattern to specifications for future use.

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)
- timber products, including features, characteristics and applications
- moulding and casting techniques
- tooling required for casting/moulding
- methoding techniques
- use and application of jigs and fixtures
- methods of constructing wood patterns

- formulae and mathematical techniques required for necessary manufacturing of patterns/core boxes, i.e. contraction, taper, clearances and machining allowances
- identification coding and numbering
- pattern checking techniques
- mouldability i.e. surface finish, face taper, convex or concave perspectives and undercuts.

Assessment Conditions

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