



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MEM04010B Develop and manufacture wood patterns**

**Release: 1**

## **MEM04010B Develop and manufacture wood patterns**

### **Modification History**

Not Applicable

## Unit Descriptor

<b>Unit descriptor</b>	This unit covers developing and manufacturing wood patterns, both regular shaped and split patterns, based on an understanding of casting and moulding principles.
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## Application of the Unit

<b>Application of the unit</b>	<p>This unit applies to the manufacture of all types of solid, split and turned wood patterns and wood pattern component parts, including but is not limited to general engineering patterns, master patterns with multiple contraction, skeleton, frame and strickle, wheels, pulleys, chain sheaves, impellers etc.</p> <p>Patterns may be 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 strength. A full range of timber and timber composites may be used.</p> <p>Solid patterns may be set up on a regular or irregular joint. Turned patterns are manufactured using tools and machines appropriate for shaping wood. This unit covers all specifications interpreted from drawings, technical sketches and/or customer requirements.</p> <p>Tasks undertaken include utilising appropriate wood pattern making principles and techniques, designated procedures, correct and appropriate tools and equipment.</p> <p>If patterns are set up on pattern plates, see Unit MEM04012B (Assemble plated patterns).</p> <p>For the development and manufacture of marine propellers, conveyor screws, cast gears etc., Unit MEM04017B (Develop and manufacture gear, conveyor screw and propeller patterns) should also be considered.</p> <p>Where precision measurement is required, Unit MEM12003B (Perform precision mechanical measurement) should also be considered.</p> <p>This unit should not be selected when Unit MEM18014B (Manufacture tools, gauges and dies) has already been selected.</p>
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	<b>Band: A</b> <b>Unit Weight: 20</b>
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## Licensing/Regulatory Information

Not Applicable

## Pre-Requisites

Prerequisite units		
<b>Path 1</b>	MEM04018B	Perform general woodworking machine operations
	MEM09002B	Interpret technical drawing
	MEM12006C	Mark off/out (general engineering)
	MEM12023A	Perform engineering measurements
	MEM12024A	Perform computations
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment

## Employability Skills Information

<b>Employability skills</b>	This unit contains employability skills.
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## Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine job requirements	1.1. Job instructions and specifications are interpreted correctly. 1.2. Type of wood pattern required is determined through application of moulding/casting techniques and foundry processes. 1.3. Appropriate timber/timber composites are selected to meet specification.
2. Develop and lay out wood patterns	2.1. Pattern parameters are calculated to specification e.g. angles, tapers, clearances, contractions etc. 2.2. Pattern is laid out showing tapers, machining allowances, core prints and method of construction to specification. 2.3. Jigs and fixtures are developed and manufactured to aid wood pattern manufacture as required.
3. Manufacture wood patterns	3.1. Materials are marked out and construction is developed to meet specification. 3.2. Using acceptable wood pattern making techniques and procedures, and utilising appropriate hand and handheld power tools, pattern or pattern component parts are produced to size and shape and checked for conformance to specifications. 3.3. Using acceptable wood pattern making techniques and procedures, pattern component parts are joined or fixed as required and checked for conformance to specification. 3.4. Pattern is correctly marked, colour coded or tagged to specifications or standard operating procedures.

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

#### Required skills

Look for evidence that confirms skills in:

- reading/interpreting/following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other

**REQUIRED SKILLS AND KNOWLEDGE**

documents

- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit
- selecting appropriate timber to suit the moulding/casting techniques and foundry process
- laying out the pattern/core boxes
- constructing patterns/core boxes
- joining and fixing component parts
- pattern checking

**Required knowledge**

Look for evidence that confirms knowledge of:

- timber products including features, characteristics and applications
- moulding and casting techniques
- tooling required for casting/moulding
- methoding techniques
- the use and application of jigs and fixtures
- methods of construction
- the formulae and mathematical techniques required for necessary manufacturing of patterns/core boxes i.e. contraction, taper, clearances, machining allowances etc.
- identification coding and numbering
- pattern checking techniques
- mouldability i.e. surface finish, face taper, convex or concave perspectives, undercuts, etc.
- use and application of personal protective equipment
- safe work practices and procedures
- hazards and control measures associated with the development and manufacture of wood patterns

## Evidence Guide

<b>EVIDENCE GUIDE</b>	
<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
<p><b>Overview of assessment</b></p>	<p>Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.</p>
<p><b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b></p>	<p>This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, then appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with developing and manufacturing wood patterns or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p><b>Context of and specific resources for assessment</b></p>	<p>Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.</p>
<p><b>Method of assessment</b></p>	<p>Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.</p>



**EVIDENCE GUIDE**

<b>Guidance information for assessment</b>	
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**Range Statement****RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

**Moulding/casting techniques**

The variety of sand moulding techniques and sand mediums

**Timber/timber composites**

Hardwood, softwood, laminates, plywood, veneers and bonded fibreboard

**Calculations**

Calculations include the determination of contraction rates, as well as general engineering calculations

**Joining and fixing**

Glued, screwed, nailed, stapled

**Unit Sector(s)**

<b>Unit sector</b>	
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**Co-requisite units**

<b>Co-requisite units</b>	

<b>Co-requisite units</b>		

## Competency field

<b>Competency field</b>	Casting and moulding
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