



Australian Government

Department of Education, Employment and Workplace Relations

MEM04015B Develop and manufacture vacuum forming moulds and associated equipment

Release: 1

MEM04015B Develop and manufacture vacuum forming moulds and associated equipment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers developing and manufacturing all types of vacuum forming moulds and equipment.
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Application of the Unit

Application of the unit	This unit applies to the manufacture of all types of vacuum forming equipment, utilising a range of materials such as timber, composites, polymer, metal etc., appropriate pattern making principles and techniques, designated procedures, and correct and appropriate tools and equipment. Where precision measurement is required, Unit MEM12003B (Perform precision mechanical measurement) should also be considered. Where assembly of plated patterns is required, Unit MEM04012B (Assemble plated patterns) should be considered. Where manufacture of production patterns is required, Unit MEM04014B (Develop and manufacture production patterns) should be considered. Band: A Unit Weight: 6
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM04010B	Develop and manufacture wood patterns
	MEM04011B	Produce polymer patterns
	MEM04018B	Perform general woodworking machine operations
	MEM07005C	Perform general machining
	MEM09002B	Interpret technical drawing
	MEM12006C	Mark off/out (general engineering)
	MEM12023A	Perform engineering measurements
	MEM12024A	Perform computations
	MEM13003B	Work safely with industrial chemicals and materials
	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

Employability skills	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. Drawings, instructions and specifications are interpreted and understood. 1.2. Vacuum forming processes are applied to determine the design of vacuum forming moulds and associated equipment to be constructed. 1.3. Appropriate material is selected to meet specifications.
2. Develop and mark out pattern for vacuum forming	2.1. Pattern parameters are calculated, taking into account plastic sheet thickness and shrinkage etc. 2.2. Vacuum forming pattern is marked out, showing size and position of air evacuation and of the moulded form.
3. Manufacture pattern for vacuum forming	3.1. Appropriate machines and machining process are selected to shape/produce vacuum forming pattern to specification. 3.2. A range of hand and hand held power tools are selected and used to fashion/manufacture vacuum forming patterns to specification. 3.3. Constructed vacuum forming pattern is checked to specification.

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 and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- checking and clarifying task-related information
- selecting appropriate timber or epoxy resin to suit the vacuum forming process
- laying out the vacuum forming pattern or mould
- checking patterns and moulds
- calculating contraction rates
- checking for conformance to specifications

REQUIRED SKILLS AND KNOWLEDGE

- measuring components to specified tolerances
- conceptualising and determining type of model required to meet specifications
- using required hand and hand held power tools

Required knowledge

Look for evidence that confirms knowledge of:

- timber and epoxy resin product knowledge including features, characteristics and applications
- vacuum forming techniques
- tooling required for manufacture of vacuum forming patterns and moulds
- the formulae and calculations/formulae required to manufacture patterns and moulds i.e. contraction, taper
- techniques, tools and equipment to measure, mark out and produce vacuum forming patterns and moulds
- pattern checking techniques
- use and application of personal protective equipment
- safe work practices and procedures
- hazards and control measures associated with developing and manufacturing vacuum forming moulds and associated equipment

Evidence Guide

EVIDENCE GUIDE	
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.	
Overview of assessment	A person who demonstrates competency in this unit must be able to develop and manufacture vacuum forming moulds and associated equipment. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	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.
Context of and specific resources for assessment	This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an 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. 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 vacuum forming patterns and moulds or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	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 techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. 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.

EVIDENCE GUIDE

Guidance information for assessment	
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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.

Vacuum forming processes

Vacuum forming processes include positive or negative pressure forming processes

Material

Includes timber, epoxy resins, composites, polymer, metal

Calculations

The determination of contraction rates as well as general engineering calculations within the scope of this unit

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Casting and moulding
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