



Australian Government

Department of Education, Employment and Workplace Relations

MEM25002B Form and integrate fibre-reinforced structures

Release: 1

MEM25002B Form and integrate fibre-reinforced structures

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers applying, forming and integrating fibre-reinforced components. It covers the use of manual and mechanical methods using a variety of glass reinforcements and other fibres. Typical applications include marine vessel and aircraft construction.
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Application of the Unit

Application of the unit	<p>This unit applies to component construction carried out for mould installation, and application and forming operations conducted within a mould or over a former assembly. Typical applications may include hand and mechanical lay-up practices, post curing practices, core materials for stiffening application, sheathing applications using resins, adhesives, sealants and fillers, and vacuum bagging techniques where applicable.</p> <p>Product/components constructed may include hull, deck, superstructures, bulkhead and partitions, transverse and longitudinal framing, engine beds and tanks etc. Materials may include a variety of glass reinforcements and other fibres, types of laminating resins, other types of stiffening materials such as foams, core mat etc.</p> <p>Tools and equipment used for laminating work may include brushes and rollers, metal roller, gel coat and resin depositors and vacuum bagging equipment. A variety of hand and power tools and workshop machinery can be used for component construction and installation practices.</p> <p>Where mark off/out skills are required, then Unit MEM12007D (Mark off/out structural fabrications and shapes) should also be selected.</p> <p>For straightforward application of fibre-reinforced materials where no forming or integrating is required, Unit MEM25001B (Apply fibre-reinforced materials) should be regarded as sufficient.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM13003B	Work safely with industrial chemicals and materials
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations

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. Form components	1.1.Relevant materials for component construction are selected. 1.2.Relevant drawings and templates are selected. 1.3.Components are formed to specifications 1.4.Component sizing matches the appropriate template.
2. Integrate components	2.1.Integration requirements, materials fixing/bonding methods and mixing practices are determined from job specifications and manufacturer specifications. 2.2.Equipment is set up and adjusted according to standard operating procedures. 2.3.Components are fixed/bonded in accordance with job requirements and specifications. 2.4.Reinforcement materials are formed/shaped to specifications. 2.5.Component is prepared for encapsulation process.
3. Undertake post-curing of materials	3.1.Post-curing method is selected to suit job application. 3.2.Equipment/accessories for post-curing are set up. 3.3.Equipment/accessories are stored according to standard procedure.

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:

- selecting and gathering laminating resins, fibre reinforces, core materials, resins, hardeners, releasing agents, pigments, fillers
- identifying and interpreting drawings/templates for construction process
- selecting and using hand tools, power tools, workshop equipment and machinery
- checking component dimensions for compliance against templates, drawings and specifications
- selecting and mixing fixing/bonding materials
- setting and adjusting equipment such as resin/roving depositor gun, vacuum

REQUIRED SKILLS AND KNOWLEDGE

bagging equipment

- selecting adhesive/filler materials and applying fixing/bonding methods for component integration
- cutting and shaping/bevelling foams, timber/plywood reinforcements to specification
- cleaning excess fixing/bondage material
- using personal protective equipment (PPE)
- working safely
- disposing of waste in accordance with legislation
- selecting post-curing methods
- following operational procedures/safety requirements
- disassembling, cleaning and storing equipment/accessories

Required knowledge

Look for evidence that confirms knowledge of:

- typical components, fibre reinforcement and core materials, resins and hardeners, fillers, release agents, pigment additives, their attributes and their uses
- chemical and physical properties of resins, mixing ratios, laminate thicknesses, strengths and curing properties
- drawings and templates and their construction role
- applicable codes and regulations
- hand tools, power tools, workshop equipment and machinery and their use
- personal protective equipment and safety practices
- waste disposal obligations and regulations
- method used to check component dimensions against drawings, templates and specifications
- procedures used to install component, fixing/bondage and mixing application
- methods of component integration
- procedures required in setting up and adjusting equipment
- relevant adhesive/filler and fixing/bonding methods
- procedures for forming/shaping and tools/machinery used
- importance of cleaning excess fixing/bondage material
- post-curing methods, procedures and applications
- storage procedures

Evidence Guide

EVIDENCE GUIDE	
<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>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to form and integrate fibre-reinforced structures. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</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>Context of and specific resources for assessment</p>	<p>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.</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 forming and integrating fibre-reinforced structures, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</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 techniques 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>

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.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Marine craft construction
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