



Australian Government

MEM25002 Form and integrate fibre-reinforced structures

Release: 1

MEM25002 Form and integrate fibre-reinforced structures

Modification History

Release 1. Supersedes and is equivalent to MEM25002B Form and integrate fibre-reinforced structures

Application

This unit of competency defines the skills and knowledge required to apply, form and integrate fibre-reinforced components using manual and mechanical methods in marine vessel and aircraft construction applications.

It applies to component construction carried out for mould installation, and application and forming operations conducted within a mould or over a former assembly using a variety of glass reinforcements and other fibres.

Where mark off/out skills is required unit MEM12007 Mark off/out structural fabrications and shapes should also be selected.

Where straightforward application of fibre-reinforced materials and no forming or integrating is required unit MEM25001 Apply fibre-reinforced materials should be selected.

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

Band: A

Unit Weight: 4

Pre-requisite Unit

MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12023	Perform engineering measurements
MEM13003	Work safely with industrial chemicals and materials
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM18001	Use hand tools
MEM18002	Use power tools/hand held operations

Competency Field

Marine craft construction

Elements and Performance Criteria

Elements describe the essential outcomes.

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

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|---|-----------------------------------|-----|---|
| 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 | Form components | 2.1 | Select relevant materials for component construction |
| | | 2.2 | Select relevant drawings and templates |
| | | 2.3 | Form components to specifications |
| | | 2.4 | Ensure component sizing matches the appropriate template |
| | | | |
| 3 | Integrate components | 3.1 | Determine integration requirements, materials fixing/bonding methods and mixing practices from job specifications and manufacturer specifications |
| | | 3.2 | Set up and adjust equipment ready for operation |
| | | 3.3 | Fix/bond components in accordance with job requirements and specifications |
| | | 3.4 | Form/shape reinforcement materials to specifications |
| | | 3.5 | Prepare component for encapsulation process |
| | | 3.6 | Clean excess bonding material and dispose of waste following SOPs |

Elements describe the essential outcomes.

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

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|---|---|
| 4 Undertake post-curing of materials | 4.1 Select post-curing method to suit job application
4.2 Set up equipment/accessories for post-curing
4.3 Store equipment/accessories according to SOPs
4.4 Disassemble, clean and store equipment and accessories following SOPs |
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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.

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|---|---|
| Application and forming operations include one (1) or more of the following: | <ul style="list-style-type: none"> • lay-up practices • post-curing practices • core materials for stiffening application • sheathing applications using resins, adhesives, sealants and fillers • vacuum bagging techniques, where applicable |
| Products/components constructed include one (1) or more of the following: | <ul style="list-style-type: none"> • hull • deck • superstructures • bulkhead and partitions • transverse and longitudinal framing • engine beds • tanks |

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.

Materials include one (1) or more of the following:

- types of laminating resins
- hardeners
- releasing agents
- pigments
- fillers
- variety of glass reinforcements and other fibres
- stiffening materials, including:
 - foams
 - core mat

Tools and equipment include one (1) or more of the following:

- brushes and rollers
- metal rollers
- gel coat
- resin depositors
- vacuum bagging equipment
- hand and power tools
- workshop machinery

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM25002B Form and integrate fibre-reinforced structures

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 MEM25002 Form and integrate fibre-reinforced structures

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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 and drawings/templates to form and integrate fibre-reinforced structures
- selecting and gathering materials for the construction purpose
- selecting and using the appropriate hand and power tools, workshop equipment and machinery and checking component dimensions for compliance against templates/drawings in accordance with specifications
- selecting and mixing fixing/bonding materials in accordance with job specifications using appropriate tools and equipment
- selecting adhesive/filler materials and applying fixing/bonding methods for component integration and cutting and shaping/bevelling foams and timber/plywood reinforcements to specifications
- cleaning excess fixing/bonding material and disposing of waste following SOPs
- selecting post-curing method to suit job application
- disassembling, cleaning and storing equipment/accessories in accordance with procedures.

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)
- typical components, fibre reinforcement and core materials, resins and hardeners, fillers, release agents and 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
- 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 and waste disposal obligations and regulations
- post-curing methods, procedures and applications
- storage procedures.

Assessment Conditions

- Assessors must:
 - have vocational competency in forming and integrating fibre-reinforced structures 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. This must 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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