MEM31112 Certificate III in Engineering - Composites Trade

Modification History
Release 1 - new qualification
Description
This qualification covers the skills and knowledge required by a tradesperson working with
composites within the metal, engineering, manufacturing and associated industries, or other
industries where composites tradespersons work. The qualification has been specifically
developed to meet the needs of apprentices in the above trade. The qualification packaging
has been developed on the assumption that competency will be developed through an
integrated combination of on and off-the-job learning strategies such as those delivered
through a formal apprenticeship. The qualification may also be achieved through formal skills
recognition assessment processes.

Job roles/employment outcomes
The MEM3112 Certificate III in Engineering - Composites Trade specifies the competencies
required for employment as a composites tradesperson, including:

- laying up composites
- selecting and using materials and components for composite products
- handling, using and storing materials and components used in composites
- undertaking repairs and modifications to composite components
- undertaking repairs and modifications using composites
- adjusting resin chemicals for composite products and conditions
- selecting and using joining techniques.

People with this qualification may work in a large manufacturing organisation, a smaller
workshop, a repair facility, a defence or a government facility. The composites tradesperson
may work in a composites manufacturing or repair organisation, or they may work in an
aerospace, civil construction, general manufacturing, marine, vehicle or other organisation as
a composites specialist. They may be part of a large organisation or they may be an
independent contractor performing composites trade work for other organisations.

‘Composites’ in this application refers to reinforced resin components and does not include
geo-textile or other industrial textiles.

Application
This qualification is designed to provide an industry recognised skills profile related to
working as a composites tradesperson. Skills development would usually be undertaken
through an Australian Apprenticeship arrangement where the mix of on and off-the-job
training would be specified in the Training Plan associated with the Contract of Training
between the employer and apprentice.

This work will generally be undertaken in a factory or workshop environment but may also be
undertaken onsite.

Assessment of some units of competency must, where indicated, include evidence of the
candidate's performance in a productive work environment where there is a sufficient range of
appropriate tasks and materials to cover the scope of application of those units. All outcomes
must reflect the standard of performance inherent in the job.

Pathways Information
Pathways into the qualification
There is no qualification entry requirement. It is assumed that the learner is engaged as an apprentice under a Training Contract and that the learner is involved in appropriate structured on-the-job learning while undertaking this qualification. This qualification may be accessed by direct entry. Credit for relevant units of competency achieved should be granted towards this qualification for those who have completed other relevant qualifications. Credit towards this qualification may also include units of competency contained within relevant pre-vocational and pre-apprenticeship programs and Statements of Attainment.

Pathways from the qualification
Further training pathways from this qualification include MEM40105 Certificate IV in Engineering and MEM50105 Diploma of Engineering – Advanced Trade or other relevant qualifications. Competitive Manufacturing qualifications are available for employees at this level who already possess trade and other technical skills and who require additional manufacturing practice skills above those available in this qualification.

Licensing/Regulatory Information
There are no specific licences that relate to this qualification.

Entry Requirements
Not applicable.
## Employability Skills Summary

<table>
<thead>
<tr>
<th>Employability Skill</th>
<th>Industry/enterprise requirements for this qualification include:</th>
</tr>
</thead>
</table>
| **Communication**           | • Read, interpret, follow and communicate information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents  
                              • Convey and share technical information  
                              • Produce sketches, diagrams, charts or graphs  
                              • Check and clarify task-related information  
                              • Recognise and use common fabrication terminology  
                              • Liaise with appropriate authorities                                                                                                                                                                                                                                                                               |
| **Teamwork**                | • Work alone or as part of a team  
                              • Contribute to a group effort in order to plan and carry out work  
                              • Identify work roles, communicate and cooperate with others                                                                                                                                                                                                                                                                 |
| **Problem solving**         | • Undertake numerical operations, geometry and calculations/formulae (including addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages)  
                              • Use appropriate measuring techniques  
                              • Inspect quality of own or other employee's work  
                              • Analyse information according to enterprise and work requirements  
                              • Assess operation and condition of components against specifications or manufacturer’s requirements  
                              • Use diagnostic skills to identify and determine causes of faults, including interpretation of in-built fault indicators and error codes  
                              • Translate designs into practical outcomes                                                                                                                                                                                                                                                                 |
| **Initiative and enterprise** | • Be capable of applying the competency in new and different situations and contexts  
                              • Identify actual and foreseeable workplace hazards during course of work  
                              • Implement OHS risk management procedures  
                              • Modify work plan to overcome unforeseen difficulties or developments that occur as work progresses  
                              • Participate in improvement procedures, including process, quality and internal/external customer/supplier relationships  
                              • Economise material use and minimise waste                                                                                                                                                                                                                                                                 |
| **Planning and organising** | • Plan, prioritise and sequence work operations/complete activities/scheduled production  
                              • Select and use planning techniques and tools                                                                                                                                                                                                                                                                 |
- Organise and analyse information relevant to work
- Set up jobs prior to commencement of work, including selection of appropriate tools, equipment and materials and adjustment of equipment

**Self-management**
- Carry out work safely and in accordance with company policy and procedures, manufacturer’s recommendations, environmental guidelines and legislative requirements
- Monitor performance of operation or quality of product or service to ensure customer satisfaction
- Take responsibility for own work outcomes
- Apply techniques, procedures, tools and equipment for compliance with site or manufacturer specifications

**Learning**
- Check and clarify task related information with appropriate personnel or technical adviser
- Identify customers’ requirements with respect to the operation or quality of the product or service
- Assess and modify own work practices
- Use manuals, online help and other reference materials, such as catalogues/lists, as required
- Maintain current knowledge of applicable standards, legislation, codes of practice and product/process developments
- Assist with on-the-job training and assessment

**Technology**
- Select and use appropriate tools, equipment, materials and machines
- Select and use appropriate measuring/testing devices
- Navigate technology to access/input/store/retrieve/save and produce information/data using appropriate software applications
- Apply knowledge of appropriate engineering principles, techniques, procedures, tools and equipment to achieve the required outcome

**Packaging Rules**

The minimum requirements for achievement of the MEM3112 Certificate III in Engineering - Composites Trade are:
- completion of all core units of competency listed below
- completion of elective units to a total value of at least 73 points, chosen as described below:
  - basic composite fabrication units from Group A to the value of at least 12 points
  - composite trade specialisation units from Group B to the value of at least 28 points
  - units not already chosen from Group B and trade specialisation units from Group C to bring the total value to at least 73 points.
Units with prerequisites are marked with an asterisk. Points associated with prerequisites count towards the total (refer to units and prerequisites listing in Appendix 2).
Appropriate Group C elective units to the value of 16 points may be chosen from other endorsed Training Packages and accredited courses where those units are available for inclusion at Certificate III.
Registered Training Organisations must seek a determination from Manufacturing Skills Australia in respect of the allocation of points values for units of competency drawn from other Training Packages or accredited courses.
Note that the elective units listed below include all of the units that are approved for selection from the MEM05 Training Package for use in this qualification. This meets the flexibility requirement that one sixth of the total units must be able to be selected from other qualifications in the same Training Package.

Core units of competency
- Select all units from this list.

<table>
<thead>
<tr>
<th>Unit code</th>
<th>Unit title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEM12023A</td>
<td>Perform engineering measurements</td>
</tr>
<tr>
<td>MEM12024A</td>
<td>Perform computations</td>
</tr>
<tr>
<td>MEM13014A</td>
<td>Apply principles of occupational health and safety in the work environment</td>
</tr>
<tr>
<td>MEM14004A</td>
<td>Plan to undertake a routine task</td>
</tr>
<tr>
<td>MEM14005A</td>
<td>Plan a complete activity</td>
</tr>
<tr>
<td>MEM15002A</td>
<td>Apply quality systems</td>
</tr>
<tr>
<td>MEM15024A</td>
<td>Apply quality procedures</td>
</tr>
<tr>
<td>MEM16006A</td>
<td>Organise and communicate information</td>
</tr>
<tr>
<td>MEM16007A</td>
<td>Work with others in a manufacturing, engineering or related environment</td>
</tr>
<tr>
<td>MEM16008A</td>
<td>Interact with computing technology</td>
</tr>
<tr>
<td>MEM17003A</td>
<td>Assist in the provision of on the job training</td>
</tr>
<tr>
<td>MSAENV272B</td>
<td>Participate in environmentally sustainable work practices</td>
</tr>
</tbody>
</table>

Elective units of competency
Group A – Composite fabrication units
- Select units from this list to the value of at least 12 points.

<table>
<thead>
<tr>
<th>Unit code</th>
<th>Unit title</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEM26001A</td>
<td>Lay up composites using open moulding techniques</td>
<td>6</td>
</tr>
<tr>
<td>MEM26002A</td>
<td>Lay up composites using vacuum closed moulding techniques</td>
<td>6</td>
</tr>
<tr>
<td>MEM26003A</td>
<td>Lay up composites using pressure closed moulding techniques</td>
<td>6</td>
</tr>
</tbody>
</table>

Group B - Composites trade specialisation units
- Select units from this list to the value of at least 28 points.

<table>
<thead>
<tr>
<th>Unit code</th>
<th>Unit title</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEM26004A</td>
<td>Make basic plugs for composites fabrication</td>
<td>3</td>
</tr>
<tr>
<td>MEM26005A</td>
<td>Make basic moulds for composites fabrication</td>
<td>3</td>
</tr>
<tr>
<td>MEM26006A</td>
<td>Mark and cut out sheets for composite use</td>
<td>4</td>
</tr>
<tr>
<td>MEM26007A</td>
<td>Select and use reinforcing appropriate for product</td>
<td>4</td>
</tr>
<tr>
<td>MEM26008A</td>
<td>Select and use resin systems appropriate for product</td>
<td>4</td>
</tr>
<tr>
<td>MEM26009A</td>
<td>Select and use cores and fillers appropriate for product</td>
<td>2</td>
</tr>
<tr>
<td>MEM26010A</td>
<td>Store and handle composite materials</td>
<td>2</td>
</tr>
<tr>
<td>MEM26011A</td>
<td>Determine materials and techniques for a composite component or product*</td>
<td>6</td>
</tr>
<tr>
<td>MEM26012A</td>
<td>Record and trial work processes for one-off composite products</td>
<td>4</td>
</tr>
<tr>
<td>MEM26013A</td>
<td>Select and use composite processes or systems appropriate for product</td>
<td>4</td>
</tr>
<tr>
<td>MEM26014A</td>
<td>Adjust resin chemicals for current conditions</td>
<td>4</td>
</tr>
<tr>
<td>MEM26015A</td>
<td>Select and apply repair techniques</td>
<td>6</td>
</tr>
<tr>
<td>MEM26016A</td>
<td>Select and use joining techniques</td>
<td>6</td>
</tr>
<tr>
<td>MEM26017A</td>
<td>Prepare composite or other substrate surfaces</td>
<td>4</td>
</tr>
<tr>
<td>Unit code</td>
<td>Unit title</td>
<td>Points</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>MEM26018A</td>
<td>Organise composite trials</td>
<td>4</td>
</tr>
<tr>
<td>MEM26019A</td>
<td>Finish a composite product</td>
<td>4</td>
</tr>
<tr>
<td>MEM26020A</td>
<td>Identify and interpret required standards for composites</td>
<td>2</td>
</tr>
</tbody>
</table>

Group C - specialisation units

- Select additional units from Group B or from the Certificate III Trade Specialisation units listed in Appendix I of this Training Package to bring the total value of units to at least 73 points, including any prerequisites.
- Appropriate specialisation units to the value of 16 points may be chosen from other endorsed Training Packages and accredited courses where those units are available for inclusion at Certificate III.

**Custom Content Section**

Not applicable.