



Australian Government

MEM26001 Lay up composites using open moulding techniques

Release: 1

MEM26001 Lay up composites using open moulding techniques

Modification History

Release 1. Supersedes and is equivalent to MEM26001A Lay up composites using open moulding techniques

Application

This unit of competency defines the skills and knowledge required to fabricate composites using open moulding techniques.

This unit is one of three units covering the basic composite fabrication techniques, the other two being unit MEM26002 Lay up composites using vacuum closed moulding techniques and unit MEM26003 Lay up composites using pressure closed moulding techniques, which together are intended to ensure the composite tradesperson can undertake a basic fabrication using these methods.

Where mechanically assisted movement of large parts is required, appropriate units should also be selected.

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

Band: A

Unit Weight: 6

Pre-requisite Unit

MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information

Competency Field

Composites

Elements and Performance Criteria

Elements describe the essential outcomes.

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

1	Determine product requirements	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS)

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		requirements at all times	
		1.3	Select and use appropriate personal protective equipment (PPE) in accordance with SOPs
		1.4	Identify product requirements from specifications, job sheets or work instructions and customer requests
		1.5	Select open moulding technique most appropriate to product requirements
		1.6	Identify or develop required procedures to make product using selected process
2	Set up equipment/ workplace and prepare materials	2.1	Select required items of equipment and ancillary equipment
		2.2	Prepare and assemble all equipment and ancillary equipment as required by procedures
		2.3	Identify required reinforcing/reinforcing system and determine quantity of reinforcing
		2.4	Prepare reinforcing including cutting to size/shape and carry out any pre-treatment, as required
		2.5	Identify required resin system
		2.6	Determine quantity of resin components and confirm adequate quantities are available
		2.7	Mix resin with minimised waste and test resin
3	Fabricate and adjust equipment and materials, as required	3.1	Identify and control hazards
		3.2	Apply gel coat, resin and reinforcing in accordance with procedures
		3.3	Ensure required resin distribution
		3.4	Cure product and remove product from mould when ready

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| | | 3.5 | Identify typical problems and take appropriate remedial action |
| | | 3.6 | Perform final verification to meet product requirements |
| 4 | Clean up and maintain equipment | 4.1 | Clean all moulding and mixing equipment |
| | | 4.2 | Undertake minor maintenance, as appropriate |
| | | 4.3 | Prepare for next use or storage |
| | | 4.4 | Inspect equipment for faults and take appropriate corrective action |
| | | 4.5 | Store equipment |
| | | 4.6 | Minimise and dispose of waste as appropriate |
| | | 4.7 | Complete required logs and reports according to SOPs |

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.

Open moulding techniques include one (1) or more of the following:

- hand lay-up
- chopper gun
- filament winding

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Equipment includes the following:

- moulds and mould components
- resin application and dispersion tools

Typical problems include one (1) or more of the following:

- contamination
- air entrapment
- resin rich
- uneven distribution of resin
- difficult mould shapes
- resin curing too quickly
- resin curing too slowly
- failure to release

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM26001A Lay up composites using open moulding techniques

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 MEM26001 Lay up composites using open moulding techniques

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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, formulas/recipes, batch sheets and customer requests for laying up composites using open moulding techniques
- calculating the quantity of materials required and applying gel coat and resin using rollers, brushes and/or chopper gun in accordance with procedures
- identifying and preparing reinforcement/reinforcement system
- assembling, cleaning and preparing simple and complex moulds and applying wax to release systems
- removing product from simple and complex moulds using appropriate equipment
- ensuring compliance to specifications
- identifying and rectifying any typical problems and monitoring curing cycles
- undertaking minor maintenance to chopper guns and/or pump systems (reciprocating airless pumps with air support in accordance with procedures
- minimising wastage
- completing all documentation and reports, including items requiring further action, in accordance with SOPs.

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)
- preparation schedules, terminology and information relevant to standard work instructions
- current state/territory work health and safety (WHS) legislation, standards and codes of practice relevant to laying up composites using open moulding techniques
- release agents surface tension
- gel coat, resin types and applications
- types of reinforcement and lay-up techniques
- common tools/equipment and their maintenance

- operation and maintenance requirements for solvent cleaners (filters)
- correct laminating techniques and finishing off (e.g. detail consolidation/rolling, check consistency and evenness of resin/glass, remove air entrapment and check with light)
- managing post-cure requirements (e.g. air cure and oven cure)
- production environment variables including the effect of humidity (e.g. epoxy backbone), temperature, ultraviolet (UV) light and contamination from other processes
- managing hazardous environments (e.g. styrene levels)
- function of catalysts, accelerators and promoters
- control of overspray
- storage of moulds
- waste disposal.

Assessment Conditions

- Assessors must:
 - have vocational competency in laying up composites using open moulding techniques 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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