



Australian Government

MEM26016 Select and use joining techniques

Release: 1

MEM26016 Select and use joining techniques

Modification History

Release 1. Supersedes and is equivalent to MEM26016A Select and use joining techniques

Application

This unit of competency defines the skills and knowledge required to join composites to other composite components or other materials.

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 job requirements	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS) requirements at all times
		1.3	Select and use appropriate personal protective equipment (PPE) in accordance with SOPs
		1.4	Determine finished application properties
		1.5	Develop required technical specifications of join

Elements describe the essential outcomes.

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

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| | | 1.6 | Identify properties of surfaces to be joined |
| 2 | Select most appropriate joining system | 2.1 | Short list suitable joining techniques and materials |
| | | 2.2 | Compare technical properties of different joining systems with requirements |
| | | 2.3 | Check safety data sheets (SDS) of joining materials |
| | | 2.4 | Determine preparation required of surfaces to be joined |
| | | 2.5 | Select most appropriate joining system |
| | | 2.6 | Make sample join using the system |
| | | 2.7 | Conduct/organise for relevant tests |
| | | 2.8 | Evaluate test results against product requirements |
| | | 2.9 | Review fabrication process and make any required changes to system |
| 3 | Complete the required join | 3.1 | Identify and control hazards |
| | | 3.2 | Prepare surface, as required |
| | | 3.3 | Prepare tools, equipment and materials required for join |
| | | 3.4 | Undertake required join and minimise waste |
| | | 3.5 | Review joined product compared to requirements of the job |
| | | 3.6 | Review materials and techniques selected |
| | | 3.7 | Identify areas for improvement and take appropriate actions |
| | | 3.8 | Complete any required documentation/reporting 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.

Finished application properties include the following:

- permanent/removable
- waterproof/chemical resistant
- structural rigidity
- strength (tensile, compressive, shear and torsional)
- aesthetic

Properties of surfaces to be joined include the following:

- materials of construction
- physical properties (e.g. strength and rigidity)
- surface properties (e.g. surface finish and surface treatment/coatings)
- size and shape

Joining system includes one (1) or more of the following:

- bonding (e.g. adhesive, gluing, ethacrylates, sikaflex and epoxy)
- using composite materials (e.g. Probond, Divelett, K-Lite and Eurmere)
- secondary bonding – cured composite to cured composite
- using mechanical fasteners (e.g. bolts and rivets)

Preparation of surfaces includes one (1) or more of the following:

- solvent or other chemical cleaning
- chemical etching
- mechanical preparation such as blasting, buffing
- surface smoothing (e.g. machining)
- making of holes or other physical locking features

Most appropriate joining system includes the following:

- compliance with product requirements
- greatest ease of joining
- best financial return
- greatest sustainability contribution

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.

Requirements of the job include one (1) or more of the following:

- rigid or flexible
- water, ultraviolet (UV), chemical or fire resistant
- or have other properties, as well as the required strength

Areas for improvement include one (1) or more of the following:

- incompatible requirements
- hazardous materials/preparation methods
- non-uniform join

Sustainability includes the following:

- survival of the ecology/physical environment
- economic viability
- social sustainability

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM26016A Select and use joining 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 MEM26016 Select and use joining 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, safety data sheets (SDS) for selecting and using joining techniques
- considering all reasonably available joining techniques and materials when selecting and choosing the appropriate technique
- preparing surfaces to be joined
- making a sample join and conducting/organising relevant test and evaluating the test results and making any required changes, as appropriate
- completing the required join using hand and power tools, applying assembly techniques and applying bonding joiner and techniques and minimising waste in accordance with procedures
- identifying areas for improvement and taking appropriate action
- completing all documentation and reporting 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)
- adhesives (e.g. plexus – methylmethacrylate)
- sealants (e.g. sikaflex – silicon or butyl mastic)
- mechanical joining
- substrates and interactions with joiner
- surface preparation of substrate
- application methods
- clamping forces (minimum and maximum)
- adhesive/sealant thickness
- primers

- design rules around fastening (e.g. minimum area for pop rivets, rivet spacing and rivet patterns)
- edge finish of pilot holes
- quality requirements with the hole preparation and with the installation of fasteners
- radius of edge of laminate
- effect of flatness and smoothness of joining surfaces
- substrate composition in joining area.

Assessment Conditions

- Assessors must:
 - have vocational competency in selecting and using joining 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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