



Australian Government

PMBTECH507 Develop fibre-composite products using cored-laminate techniques

Release: 1

PMBTECH507 Develop fibre-composite products using cored-laminate techniques

Modification History

Release 1. Supersedes and is equivalent to PMBTECH507B Develop fibre composite products using cored-laminate techniques

Application

This unit of competency covers the skills and knowledge required to develop designs for 'sandwich type' fibre-composite laminates.

This unit of competency applies to the design of new sandwich products using the range of materials and techniques which are standard within a particular enterprise

This unit of competency applies to experienced technicians or those in similar roles who are required to apply in-depth knowledge of materials, process, equipment and problem solving in order to determine appropriate materials and processes to meet design objectives; determine appropriate equipment and process settings and adjustments; develop drawings of new product; and solve technical problems associated with the design and manufacturing procedures.

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

Pre-requisite Unit

MEM09003B Prepare basic engineering drawing

Competency Field

Technical

Unit Sector

Not applicable

Elements and Performance Criteria

Elements describe the essential outcomes.

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

1	Confirm product specification	1.1	Confirm physical/structural properties required of product
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| | | 1.2 | Confirm other requirements of product |
| | | 1.3 | Identify relevant regulations/standards/codes of practice which may be applicable |
| | | 1.4 | Draw/use hand sketch to confirm product size and shape |
| 2 | Identify technical requirements | 2.1 | Determine the laminate properties appropriate for the job |
| | | 2.2 | Select the appropriate core material(s) |
| | | 2.3 | Select the appropriate resin, matrix and other materials |
| | | 2.4 | Determine joints, attachment points and other special features required |
| | | 2.5 | Determine lay-up technique to be used |
| 3 | Develop specification for manufacturing product | 3.1 | Develop technical/engineering drawing of new product to company required standards |
| | | 3.2 | Develop material list/specification for new product |
| | | 3.3 | Develop manufacturing procedures/specifications for new product |
| | | 3.4 | Complete required documentation |
| 4 | Make trial samples, as required | 4.1 | Liaise with production and other relevant people to ensure specifications/procedures are clear, adequate and understood |
| | | 4.2 | Provide technical expertise to the production process as required to facilitate manufacture |
| | | 4.3 | Test samples for function and quality |
| | | 4.4 | Modify designs where necessary to meet manufacturing and other requirements |
| 5 | Anticipate and | 5.1 | Recognise a problem or a potential problem |

solve problems	5.2	Determine possible cause
	5.3	Refer problems outside area of responsibility to appropriate person, with possible cause
	5.4	Seek information and assistance as required, to solve problems
	5.5	Solve problems within area of responsibility
	5.6	Follow through items initiated until final resolution has occurred

Foundation Skills

This section describes those required skills (language, literacy and numeracy) that are essential to performance.

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.

Regulatory framework The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used.

Applicable legislation, regulations, standards and codes of practice include:

- health, safety and environmental (HSE) legislation, regulations and codes of practice relevant to the workplace, materials and processes being used and products being made
- Australian/international standards relevant to the materials being used and products being made
- any relevant licence and certification requirements.

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and such requirements the

legislative requirements take precedence.

Procedures All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, and include one or any combination of:

- test procedures
- technical specifications
- technical drawings
- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant.

Tools and equipment Tools and equipment include:

- manual and/or computer-aided drawing tools
- measuring tools.

Hazards Hazards must be identified and controlled. Identifying hazards requires consideration of:

- hazardous products and materials
- fibres (airborne and handled)
- other hazards that might arise.

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMBTECH507B Develop fibre composite products using cored-laminate techniques

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=932aacef-7947-4c80-acc6-593719fe4090>

Assessment Requirements for PMBTECH507 Develop fibre-composite products using cored-laminate 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 and demonstrate the ability to:

- read and interpret test results, technical information, equipment specifications and instruments/control panels
- confirm product design specifications and regulatory framework
- identify critical materials properties and structural considerations relevant to the design objectives and the end product
- analyse information and data to specify technical requirements
- develop technical/engineering drawing of new product
- develop manufacturing specifications and procedures
- contribute technical expertise to trialling of samples
- modify designs as required based on trial results
- communicate technical information verbally and in writing
- calculate and interpret statistics, product formulae and process conditions
- apply theoretical and technical knowledge and experience of materials, process, equipment and product to anticipate and solve problems, including one (1) or more of:
 - structural optimisation
 - strength problems
 - core shearing
 - bending
 - cost
- calculate and interpret statistics, product formulae and process conditions.

Knowledge Evidence

Must provide evidence that demonstrates knowledge relevant to their job sufficient to fulfil their job role, including knowledge of:

- principal construction techniques and the technical advantages of various types
- material properties and their suitability for use as core (e.g. PVC rigid foams, PU foams, SAN foams, linear PVC foams, plywood, balsa and honeycomb materials)
- layered or laminate structural behaviour
- hand lay-up and vacuum-bagging techniques

- failure modes
- function and operating principles of composites forming equipment, machine components and ancillary equipment
- impact of temperature, pressure and time on product quality and production output
- impact of variations in raw materials and equipment operation in relation to final product
- factors which may affect product quality or production output and appropriate remedies
- organisation procedures relevant to the work environment/job role
- hierarchy of control
- hazards that may arise in the job/work environment and:
 - their possible causes
 - potential consequences
 - appropriate risk controls.

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence shall be based on a holistic assessment of the evidence.
- Where the assessee does not currently possess evidence of competency in *MEM09003B Prepare basic engineering drawing*, it may be co-assessed with this unit.
- The collection of performance evidence is best done from a report and/or folio of evidence drawn from:
 - a single project which provides sufficient evidence of the requirements of all the elements and performance criteria
 - multiple smaller projects which together provide sufficient evidence of the requirements of all the elements and performance criteria.
- A third-party report, or similar, may be needed to testify to the work done by the individual, particularly when the project has been done as part of a project team.
- Assessment should use a real project in an operational workplace. Where this is not possible or where personal safety or environmental damage are limiting factors assessment must occur using 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.
- Assessment in a simulated environment should use evidence collected from demonstration of skills and one or more of:
 - walk-throughs
 - pilot plant operation
 - industry-based case studies/scenarios
 - ‘what ifs’.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews.
- 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.

- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- In addition the assessor or anyone acting in subject matter expert role in assessment shall demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they shall assess with a subject matter expert who does meet these requirements.
- Technical competence can be demonstrated through one or more of:
 - relevant VET or other qualification/Statement of Attainment
 - appropriate workplace experience undertaking the type of work being assessed under routine and non-routine conditions
 - appropriate workplace experience supervising/evaluating the type of work being assessed under routine and non-routine conditions
- Currency can be demonstrated through one or more of:
 - being currently employed undertaking the type of work being assessed
 - being employed by the organisation undertaking the type of work being assessed and having maintained currency in accordance with that organisation's policies and procedures
 - having consulted/had contact with an organisation undertaking the type of work being assessed within the last twelve months, the consultation/contact being related to assessment
 - conducting on the job training/assessments of the type of work being assessed
 - being an active member of a relevant professional body and participating in activities relevant to the assessment of this type of work.

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