



Australian Government

# **PMBTECH507E Develop fibre-composite products using cored-laminate techniques**

Release: 1

# PMBTECH507E Develop fibre-composite products using cored-laminate techniques

## Modification History

Release 1. Unit code changed. Application changed. Elements and Performance Criteria changed. Range of Conditions removed. Assessment Requirements changed. Supersedes and is equivalent to PMBTECH507 Develop fibre-composite products using cored-laminate techniques.

## Application

This unit covers the skills and knowledge required to develop designs for cored-laminate composite (sandwich-structured) products.

This unit applies to an experienced technician working alone or as part of a team.

The unit principally refers to the development of new sandwich-structured products using the technician's application of in-depth knowledge of materials, process, equipment and problem-solving, and the range of materials and techniques that are standard within a particular enterprise or workplace.

No licensing or certification requirements exist at the time of publication. Relevant legislation, industry standards and codes of practice within Australia must be applied.

## Pre-requisite Unit

Nil.

## Competency Field

Technical

## Elements and Performance Criteria

| Elements                                  | 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 or structural properties and other attributes required of product from product use description<br>1.2 Confirm other requirements of product from product use description<br>1.3 Identify and apply relevant regulations, standards or codes of practice according to work health and safety regulations and workplace procedures |

| <b>Elements</b>                                    | <b>Performance Criteria</b>                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Elements describe the essential outcomes.          | Performance criteria describe the performance needed to demonstrate achievement of the element.                                                                                                                                                                                                                                                                                                                                                               |
|                                                    | 1.4 Create technical drawing to determine product size and shape                                                                                                                                                                                                                                                                                                                                                                                              |
| 2. Identify technical requirements                 | 2.1 Determine laminate properties from product specifications<br>2.2 Select appropriate core materials, resin, matrix and other materials to achieve product use requirements<br>2.3 Determine joints, attachment points and other special features required to achieve product use requirements<br>2.4 Determine lay-up technique to be used to achieve product use requirements                                                                             |
| 3. Develop specification for manufacturing product | 3.1 Develop accurate technical or engineering drawing of new product<br>3.2 Develop accurate and complete materials list for new product for product specification<br>3.3 Develop manufacturing procedures and specifications required to produce new product<br>3.4 Accurately complete required documentation                                                                                                                                               |
| 4. Produce trial samples                           | 4.1 Liaise with production and other relevant personnel to ensure specifications and procedures are clear, complete and understood<br>4.2 Provide technical expertise to production team to facilitate and optimise production process during sample production<br>4.3 Test samples for function and quality against job specifications<br>4.4 Use sample results to inform design modifications where necessary to meet manufacturing and other requirements |
| 5. Anticipate and solve process control variances  | 5.1 Recognise existing or potential process control variances and their causes<br>5.2 Determine, prioritise and implement remedial and preventative actions based on identified issues and causes<br>5.3 Monitor process control variances and corrective actions taken until resolved<br>5.4 Accurately maintain records and logbooks                                                                                                                        |

## Foundation Skills

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

- Numeracy skills to establish and communicate technical specifications and analyse statistical information and product formulae.
- Reading skills to interpret product use description.
- Writing and oral communication skills to produce technical drawings and specifications, support production personnel in performing trial, and record and report on process control variances.

*Other foundation skills essential to performance are explicit in the performance criteria of this unit of competency.*

## Unit Mapping Information

Supersedes and is equivalent to PMBTECH507 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 PMBTECH507E Develop fibre-composite products using cored-laminate techniques

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## Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and demonstrated the ability to:

- develop fibre-composite products using cored-laminate techniques, at least once, to meet job and product specifications, and addressing one or more of:
  - structural optimisation
  - strength problems
  - core shearing
  - bending.

## Knowledge Evidence

There must be evidence the candidate has knowledge of:

- principal construction techniques and the technical and structural considerations of various types
- material properties and their suitability for use as core, including PVC (polyvinyl chloride) rigid foams, PU (polyurethane) foams, SAN (styrene acrylonitrile) foams, linear PVC foams, plywood, balsa and honeycomb materials
- layered or laminate structural behaviour
- hand lay-up and vacuum-bagging techniques
- equipment 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 that may affect product quality or production output and appropriate remedies
- types of technical and engineering drawings, and the methods used to produce them including computer-aided design (CAD) and freehand sketching
- organisation procedures relevant to the work environment or job role
- hazards that may arise in the job or work environment and:
  - their possible causes
  - potential consequences

- appropriate risk controls.

## Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

## Links

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