



Australian Government

PMBTECH404 Mould chemical resistant and/or fire retardant fibre-composites

Release: 1

PMBTECH404 Mould chemical resistant and/or fire retardant fibre-composites

Modification History

Release 1. Supersedes and is equivalent to PMBTECH404B Mould chemical resistant and/or fire retardant fibre-composites

Application

This unit of competency covers the skills and knowledge required to laminate or lay-up special-purpose chemical resistant/fire retardant composite products. It applies to the making of a resistant/retardant laminate in a factory environment on a mould or the laying up of a composite surface on a substrate, such as a tank surface.

This competency applies to advanced operators, technicians or those in similar roles who are required to confirm the product specifications, decide on suitable materials and processes to meet specifications, and solve process and materials and problems.

This unit of competency applies to a person applying specialised theoretical and technical knowledge and well developed skills in situations that require autonomy, discretion and judgement. The person may work alone or as a member of a team or group and will work in liaison with other shift team members, team leader and supervisor, as appropriate.

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

Pre-requisite Unit

Nil

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.

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| 1 | Confirm product specifications | 1.1 | Confirm the conditions of use of the desired composite product |
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| | | 1.2 | Confirm the required specification of the desired composite product |
| | | 1.3 | Determine any other special requirements of the desired composite product |
| | | 1.4 | Obtain client sign-off of specification/requirements |
| 2 | Select appropriate materials/process to produce the desired composite product | 2.1 | Identify the laminate properties suitable for the job |
| | | 2.2 | Select the appropriate resin, matrix and other materials |
| | | 2.3 | Select the process to be used to make product |
| | | 2.4 | Implement measures to control identified hazards in line with procedures and duty of care |
| | | 2.5 | Make trial samples where required and test or arrange testing of samples as required |
| | | 2.6 | Check suitability of combination of materials and process to meet all end use requirement |
| | | 2.7 | Complete pre-start checks |
| 3 | Lay up or mould the laminate | 3.1 | Prepare and apply mould release to the mould surface if required |
| | | 3.2 | Clean and prepare structure surface for adhesion if required |
| | | 3.3 | Apply laminate materials to the mould or to the structure as required |
| | | 3.4 | Inspect/test the laminate surface as required |
| | | 3.5 | Make adjustments to remedy faults and nonconformity as required |
| | | 3.6 | Adjust process to minimise scrap and waste |
| | | 3.7 | Clean, adjust and lubricate equipment as required |
| 4 | Anticipate and | 4.1 | Recognise a problem or a potential problem |

- solve problems**
- 4.2 Determine problems needing priority action
 - 4.3 Determine possible fault causes
 - 4.4 Solve problems within area of responsibility
 - 4.5 Refer problems outside area of responsibility to designated person, with possible causes
 - 4.6 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, manual handling, hazardous materials and product specifications
- 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:

- moulds
- hand mixing tools, such as stirrers
- knives and cutters to trim fibres
- hand application tools, such as rollers, trowels and brushes
- relevant personal protective equipment (PPE).

Hazards

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

- working at heights
- working in confined spaces
- weight, shape, volume of materials to be handled
- hazardous products and materials
- rotational equipment or vibration
- sharp edges, protrusions or obstructions
- slippery surfaces, spills or leaks
- smoke, dust or other atmospheric hazards
- high temperatures
- electricity
- gas
- gases and liquids under pressure
- structural hazards

- equipment failures
- machinery, equipment and product mass
- other hazards that might arise.

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMBTECH404B Mould chemical resistant and/or fire retardant fibre-composites

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 PMBTECH404 Mould chemical resistant and/or fire retardant fibre-composites

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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 technical information, product specifications, material labels and safety data sheets (SDS)
- interpret corrosion resistance and fire retardance data/tables
- confirm specifications and special requirements with client
- determine materials and process that will meet product specifications and special requirements
- confirm suitability of combination of materials and process to meet requirements
- prepare for and apply laminate materials to the mould/structure
- monitor key variables, including:
 - surface finish
 - colour
 - thickness
 - product integrity and general conformance to specifications
- apply technical knowledge to recognise, anticipate and rectify quality, materials and process problems within area of responsibility
- make adjustments to remedy faults and nonconformity
- identify hazards and apply relevant hazard controls
- communicate effectively with team/work group and supervisors
- complete workplace records.

Knowledge Evidence

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

- types of materials, techniques and equipment used in construction of:
 - chemical resistant laminates
 - fire retardant laminates
 - wet area applications
- application of special purpose products across sectors and impact on product/process/materials requirements

- factors which may affect product quality or production output and appropriate remedies
- characteristics of materials and their behaviour in relation to process conditions and stages of production
- critical materials properties and process variables in relation to the process requirements and the end product
- materials properties and production processes for special-purpose products, including:
 - waterproofing
 - alkali and acid resistance
 - heat resistance
 - fire retardancy
 - smoke generation
 - abrasion resistance
 - cold weather performance and curing
- material and equipment conditions which may lead to out-of-specification production
- impact of variations in raw materials and equipment operation in relation to final product
- changes to materials at various stages of production
- quality requirements at each production stage
- routine and non-routine problems that may arise, the range of possible causes and appropriate actions
- 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.
- 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.
- The regulatory framework will be reflected in workplace policies and procedures and is not required to be independently assessed.
- 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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