



Australian Government

PMBPROD355 Make pattern/plug for composites moulds

Release: 1

PMBPROD355 Make pattern/plug for composites moulds

Modification History

Release 1. Supersedes and is equivalent to PMBPROD355B Make pattern/plug for composites moulds

Application

This unit of competency covers the skills and knowledge required to plan and make a plug/pattern from which composite moulds can be made.

This unit of competency applies to experienced operators who are required to convert the specification or design into a plan for the tooling and mould, construct the plug/pattern, make adjustments to remedy faults and non-conformity and solve problems within area of responsibility.

This unit of competency applies to an experienced operator demonstrating theoretical and technical knowledge and well developed skills in situations that require some discretion and judgement. The experienced operator 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

PMBPROD247 Hand lay up composites

MEM09002B Interpret technical drawing

Competency Field

Production

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 | Plan own work requirements | <ul style="list-style-type: none">1.1 Identify equipment and processes to be used for production process and upstream and downstream operations from production plan or request1.2 Identify and check materials required, including additives and regrind, and their amounts or percentages1.3 Implement measures to control identified hazards in line with procedures and duty of care1.4 Identify requirements for materials, quality, and production and equipment checks |
| 2 | Plan and set up plug/pattern construction to procedures | <ul style="list-style-type: none">2.1 Produce a plan for the plug/pattern according to requirements2.2 Plan all steps of the plug/pattern construction2.3 Identify check points for measurements and tests2.4 Identify and locate a work area, tools, materials and equipment for construction2.5 Complete pre-start checks |
| 3 | Construct the plug/pattern to procedures | <ul style="list-style-type: none">3.1 Start plug/pattern construction process, noting key variables3.2 Take samples as required and identify product out-of-specification3.3 Monitor plug/pattern conformity to requirements3.4 Make adjustments to remedy faults and non-conformity as required3.5 Complete construction process3.6 Treat, prepare and repair the surface of the plug/pattern as necessary3.7 Adjust process to minimise scrap and trim3.8 Clean and adjust equipment as required |

4	Respond to problems	4.1	Recognise a problem or a potential problem
		4.2	Determine problems needing priority action
		4.3	Refer problems outside area of responsibility to appropriate person, with possible causes
		4.4	Seek information and assistance as required to solve problems
		4.5	Solve problems within area of responsibility
		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 and hazardous materials
- 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:

- 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:

- hand tools
- power tools
- hand mixing equipment and stirrers
- hand application tools (e.g. rollers, trowels, brushes and filleting tools)
- ancillary equipment that is integral to the process.

Additional tools and equipment will be selected as required from:

- hoists/lifting equipment not requiring any special permits or licences
- manual handling aids, such as hand carts and trolleys
- relevant personal protective equipment (PPE).

Hazards

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

- weight, shape, volume of materials to be handled
- hazardous products and materials
- flammability
- rotational equipment or vibration
- sharp edges, protrusions or obstructions
- slippery surfaces, spills or leaks
- smoke, dust, vapours 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.

Problems

Non-routine problems must be resolved by applying operational knowledge to develop new solutions, either individually or in collaboration with relevant experts, to:

- determine problems needing action
- determine possible fault causes
- develop solutions to problems which do not have a known solution
- follow through items initiated until final resolution has occurred
- report problems outside area of responsibility to designated person.

Non-routine problems are unexpected problems or variations of previous problems and include one or more of:

- emergency situations
- release agents failure
- mould release failure
- warping or cracking after moulding
- structural strength, rigidity and stability of the tooling
- dimensional accuracy of the tooling
- allowances in the design for shrinkage, deformations and alterations in the process from tooling to mould to finished composite product
- intermittent faults.

Operational knowledge includes one or more of:

- procedures
- training
- technical information, such as journals and engineering specifications
- remembered experience
- relevant knowledge obtained from appropriate people.

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMBPROD355B Make pattern/plug for composites moulds

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 PMBPROD355 Make pattern/plug for composites moulds

Modification History

Release 1. Supersedes and is equivalent to PMBPROD355B Make pattern/plug for composites moulds

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 product specifications, job sheets and material labels
- plan the plug/pattern according to requirements
- plan and sequence steps to construct the plug/pattern
- prepare equipment, tools and materials to meet specifications
- construct and check/test the plug/pattern
- monitor key variables, including:
 - actual and set temperatures
 - colour and uniformity
 - surface finish/appearance
 - times (including curing rates)
 - product weight and output rate product integrity and
 - general conformance to specification
- make adjustments to remedy faults and non-conformity
- identify hazards and apply relevant hazard controls
- apply safety procedures
- apply housekeeping procedures
- apply waste management procedures
- recognise early warning signs of equipment/processes needing attention or with potential problems
- distinguish between causes of problems, including:
 - operational problems
 - equipment malfunction/wear
 - materials properties
 - raw material variations/contamination
 - procedural errors
- recognise and prioritise problems requiring action
- resolve routine and non-routine problems
- communicate effectively with team/work group and supervisors
- complete workplace records

- do basic arithmetical manipulations, including additions, subtractions, divisions, fractions and percentages.

Knowledge Evidence

Must provide evidence that demonstrates knowledge relevant to their job sufficient to operate independently and to solve routine and non-routine problems, including knowledge of:

- common composite moulding processes and function and operating principles of the moulding equipment
- characteristics of materials and their behaviour in relation moulding process conditions and stages of production
- moulding process variables that affect plug/pattern construction and materials
- product requirements that affect plug/pattern construction and materials
- common options/adjustments in plug/pattern construction and materials and their impact on product quality and production output
- quality requirements at each stage of construction
- factors which may affect plug/pattern quality and appropriate remedies
- 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.
- Where the assessee does not currently possess evidence of competency in PMBPROD247 *Hand lay up composites* and MEM09002B *Interpret technical drawing*, one or both 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.
- 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.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=932aacef-7947-4c80-acc6-593719fe4090>