



Australian Government

PMBPROD358 Develop patterns

Release: 1

PMBPROD358 Develop patterns

Modification History

Release 1. Supersedes and is equivalent to PMBPROD358C Develop patterns

Application

This unit of competency covers the skills and knowledge required to plan and develop a two-dimensional pattern from which three-dimensional products or moulds can be made. Two-dimensional patterns are typically used in the fabrication, thermoforming, composites and rubber lining sectors.

This unit of competency applies to experienced operators who are required to interpret drawings and specifications, plot the dimensions and 'develop' solid objects into two-dimensional patterns, check and complete the pattern 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 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

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 Determine dimensions of | 1.1 Establish required size(s) of finished products from customer orders |
|----------------------------------|---|

	finished patterns	1.2	Check size requirements in relation to the production process and finishing capacity of the workplace
2	Plan process	2.1	Identify material for pattern from approximate size and characteristics
		2.2	Identify, locate and assemble required instruments and equipment
		2.3	Interpret drawings and related specifications
		2.4	Check procedures for using pattern development instruments and tools, and prepare equipment for use
3	Plot dimensions	3.1	Use equipment and tools following workplace procedures
		3.2	Measure, explode and plot each dimension, maintaining appropriate angles, arcs and curves
		3.3	Compare pattern dimensions and shapes with drawings and specifications, both visually and using measurements
4	Complete pattern	4.1	Ensure completed pattern indicates completion date and original drawing details
		4.2	Obtain required approvals of pattern
		4.3	Mark plans with notations for workplace requirements, including authorship, process or customer requirements, authorisation and any review dates
		4.4	Complete relevant documentation and records
5	Anticipate and solve problems	5.1	Recognise actual and/or potential problems
		5.2	Refer problems outside area of responsibility to appropriate person, with possible causes
		5.3	Seek information and assistance as required to solve problems

- 5.4 Solve problems within area of responsibility
- 5.5 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:

- manual lathe and mills
- bench drills/drill presses
- powered hand tools.

Additional tools and equipment will be selected as required from:

- laser liquid solidification equipment
- computer-aided design (CAD)/computer-aided manufacturing (CAM).

Hazards

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

- eye strain
- repetitive strain injury
- posture hazards
- hazardous products and materials
- flammability
- other hazards that might arise.

Problems

Routine and non-routine problems must be resolved.

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:

- stability of pattern in use
- damage to pattern in use
- emergency situations
- 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.

Routine problems are predictable and have known solutions and include one or more of:

- making adequate allowances for manufacture
- balancing cost of pattern with required pattern life.

Unit Mapping Information

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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 PMBPROD358 Develop patterns

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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 product specifications, customer requirements, technical specifications and technical drawings/sketches
- plan and sequence work and approvals
- conceptually manipulate two and three-dimensional shapes
- measure and plot pattern to give the correct final size/shape
- use manual and computer-assisted pattern development techniques
- monitor key variables, including:
 - pattern stability and lifecycle
 - cost effectiveness, ease of use
 - pattern integrity and conformance to specification
 - end product integrity and conformance to specification
- make adjustments to remedy faults and nonconformity
- identify hazards and apply relevant hazard controls
- recognise early warning signs of equipment/processes needing attention or with potential problems
- distinguish between causes of problems, including:
 - operational problems
 - instrument failure/malfunction
 - electrical failure/malfunction
 - mechanical failure/malfunction
 - wrong readings
 - equipment malfunction/wear
 - materials properties
 - 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 quality and reports.

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 moulding processes that require use of patterns and function and operating principles of the moulding equipment
- influence of polymer type on pattern requirements
- moulding process variables that affect pattern development
- types and application of pattern mediums and materials
- factors which may affect pattern quality and appropriate remedies
- 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.
- Where the assessee does not currently possess evidence of competency in *MEM09002B Interpret technical 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.
- 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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