



Australian Government

PMBTECH601 Develop a new product

Release: 1

PMBTECH601 Develop a new product

Modification History

Release 1. Supersedes and is equivalent to PMBTECH601B Develop a new product

Application

This unit of competency covers the skills and knowledge required to develop a new product to meet a specified end use.

This unit of competency applies to advanced technologists, technical experts or those in similar roles who are required to apply significant depth and breadth of theoretical polymer, product and process knowledge in order to design a product and manufacturing process to meet customer needs; balance business, technical and production issues; determine process capability; coordinate product trials and optimise the process for the new product.

The technologist will perform a lead technical role typically as part of a product design, development and implementation team and is not required to demonstrate 'hands on' operation of equipment as part of this competency.

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

Pre-requisite Unit

PMBTECH502 Review and analyse production trials and specify retrials

PMBTECH505 Choose polymer materials for an application

MEM15001B Perform basic statistical quality control

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 design brief of new product | 1.1 | Communicate with customer and other key stakeholders and agree on technical specification, aesthetic requirements, timelines, cost and other market requirements |
| | | 1.2 | Determine regulatory/industry code/intellectual property requirements for product |
| | | 1.3 | Identify possible tooling/process/equipment needs |
| | | 1.4 | Develop design brief, including relevant drawings, to meet needs |
| | | 1.5 | Obtain sign-off on total design brief from all relevant persons |
| 2 | Determine material requirements for product | 2.1 | Select base polymer grade/polymer blend or range of polymers/grades for evaluation |
| | | 2.2 | Select types of reinforcement and other additives needed |
| | | 2.3 | Determine material testing and evaluation regime required to meet product end use requirements, including regulatory/industry code requirements |
| | | 2.4 | Arrange for compounding, testing and evaluation of trial materials |
| | | 2.5 | Interpret material trial results and guide material trial process |
| | | 2.6 | Determine final materials specification |
| 3 | Determine process requirements for product | 3.1 | Select process to make product to meet requirements |
| | | 3.2 | Determine any special process/equipment requirements for the product |
| | | 3.3 | Communicate with production personnel to determine their concerns and/or special needs |
| 4 | Ensure process needs for new | 4.1 | Liaise with tool/die/mould/equipment design/procurement personnel |

	product have been met	4.2	Interpret hardware specifications and ensure they are appropriate for the job required
		4.3	Liaise with process personnel to ensure appropriate draft procedures for new product have been developed
5	Trial new product through the process	5.1	Design trialling procedure to deliver required information
		5.2	Ensure health, safety and environment (HSE) requirements are stringently observed
		5.3	Coordinate the trialling of the new product
		5.4	Interpret product trial results and guide product trial process
		5.5	Tune process to optimise production of new product
6	Determine process capability	6.1	Plot appropriate statistical process control charts
		6.2	Determine 3-sigma confidence limits
		6.3	Compare confidence limits with product specification
7	Coordinate product trials	7.1	Determine product testing and evaluation regime required to meet end use requirements, including regulatory/industry code requirements
		7.2	Arrange for testing and evaluation of trial product/prototype
		7.3	Interpret product trial results and guide product trial process
		7.4	Determine final product specification
		7.5	Make required changes to materials, process and equipment
8	Implement standard	8.1	Monitor initial production and adjust process, conditions and materials to make the process a smooth operation

**procedures for
new product**

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| 8.2 | Ensure process specifications reflect the optimised operation developed |
| 8.3 | Ensure standard operating procedures (SOPs) are correct for the new product |
| 8.4 | Ensure equipment and other hardware records are updated to reflect additions/changes |
| 8.5 | Ensure project records are complete and all required reports have been completed and submitted |
| 8.6 | Archive records according to company procedure |

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

- 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
- SOPs
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant.

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 PMBTECH601 Develop a new product

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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
- determine product specifications and business and market requirements
- develop design brief and drawings that balances product specifications, business and market requirements, regulatory requirements, and technical and process issues
- select and trial materials and determine final materials specifications
- liaise with the relevant personnel to determine production process and ensure tooling design and manufacture and equipment modification is correct
- design and coordinate trialling of new product
- interpret trialling results and make adjustments to optimise process and determine final specifications
- determine process capability
- communicate technical information verbally and in writing
- communicate at all levels about technical issues and bring agreement as to requirements from the different parties
- ensure final product modifications and procedures are documented and resources are available for implementation
- calculate and interpret cost estimates, market analysis data, test results, trialling data, 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:

- impact of different polymer materials, their additives and the rheological, heat and other effects of processing on design of a new product
- major polymer types and common additives (including reinforcing) and their suitability for different applications
- all standard processes and their suitability for different product/market applications
- material and product testing procedures
- the impact of the polymerisation process on the polymer process
- principles of operation of all relevant equipment and processes

- effects of variations in process, conditions and materials on optimisation and final properties of the product
- miscibility and solubility effects and phase separation/single phase processing
- 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.
- 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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