



Australian Government

PMBTECH602 Develop a new die or tool

Release: 1

PMBTECH602 Develop a new die or tool

Modification History

Release 1. Supersedes and is equivalent to PMBTECH602B Develop a new die or tool

Application

This unit of competency covers the skills and knowledge required to develop a new die or tool 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 confirm die/tool design requirements; design the die/tool; liaise with toolmaker to make the die; coordinate trials and ensure the die is functioning to specifications.

The technologist will perform a lead technical role, typically as part of a die/tool 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

PMBTECH506 Analyse the design of products and tools

MEM09003B Prepare basic engineering drawing

Competency Field

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	Confirm die requirements	1.1	Communicate with customer and other key stakeholders and agree on product technical specification, product aesthetic requirements, timelines, cost, usage and other requirements
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| | | 1.2 | Identify tool design/product design/process issues which may be in conflict and resolve |
| | | 1.3 | Develop design brief, including relevant drawings, to meet needs |
| | | 1.4 | Obtain 'sign off' on total design brief from all relevant persons |
| 2 | Develop concept design specification of new die | 2.1 | Select materials of construction or range of materials and grades |
| | | 2.2 | Select finish requirements for die/tool |
| | | 2.3 | Design die/tool using mathematical techniques |
| | | 2.4 | Validate die design specifications against die requirements and design brief |
| 3 | Liaise with toolmaker on die manufacture | 3.1 | Discuss design brief and concept design with toolmaker |
| | | 3.2 | Verify understanding of die/tool requirements and ability to meet requirements |
| | | 3.3 | Negotiate contract to make die according to company policy and procedures |
| | | 3.4 | Continue to liaise with toolmaker |
| 4 | Trial new die and determine modifications (if any) required | 4.1 | Design trialling procedure to deliver required information |
| | | 4.2 | Ensure health, safety and environment (HSE) requirements are stringently observed |
| | | 4.3 | Coordinate the trialling of the new die/tool |
| | | 4.4 | Interpret die/tool trial results and guide die trial process |
| | | 4.5 | Tune process to optimise use of new die/tool |
| 5 | Bring new die | 5.1 | Monitor initial production and adjust die, process and |

into standard production

conditions to make the process a smooth operation

- 5.2 Ensure process specifications reflect the optimised operation developed
- 5.3 Ensure standard operating procedures (SOPs) are correct for the new product
- 5.4 Ensure equipment and other hardware records are updated to reflect additions/changes
- 5.5 Ensure project records are complete and all required reports have been completed and submitted
- 5.6 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.

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)
- formulae/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 PMBTECH602 Develop a new die or tool

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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 costs, ease of use, process efficiency, technical performance, tool/die life and maintenance requirements
- 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 die/tool
- interpret trialling results and make adjustments to optimise die/tool and process and determine final specifications
- communicate technical information verbally and in writing
- communicate with internal and external stakeholders about technical issues and bring agreement as to requirements from the different parties
- ensure final die/tool modifications and procedures are documented
- calculate and interpret cost estimates, market analysis data, test results, trialling data, product formulae and process conditions
- use mathematics to design dies.

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 die/tool
- influence of die/tool design on the operability of the process and the properties of the product
- the impact of the melt viscosity on die size and design
- runner/sprue design
- impact of die size and shape on product
- Fourier analysis
- mould flow analysis

- shear stress/strain rates (viscosity)
- die/tool trialling and testing procedures
- principles of operation of all relevant equipment and processes
- differentiating features of main processes, polymer materials and materials of construction of dies/tools
- effects of variations in process, conditions and die/tool on optimisation and final properties of the product
- 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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