



Australian Government

PMBTECH402 Set advanced or complex dies

Release: 1

PMBTECH402 Set advanced or complex dies

Modification History

Release 1. Supersedes and is equivalent to PMBTECH402B Set advanced or complex dies

Application

This unit of competency covers the skills and knowledge required to set and remove advanced or complex dies as typically used for injection or blow moulding.

This unit of competency applies to technicians or those in similar roles who are required to plan the die changeover, remove and replace the die, set machine conditions, fine tune settings and production variables to achieve desired results, and rectify production/quality problems.

This unit of competency applies to a technician 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

PMBPREP304 Set a die

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.

1	Prepare to change advanced or complex die	1.1	Determine when changeover will be required, and plan requirements for die change
		1.2	Prepare dies and all equipment related to the advanced or complex die change

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| | | 1.3 | Prepare the moulding machine for die removal according to enterprise procedures |
| 2 | Change dies | 2.1 | Remove die according to enterprise procedures, in a safe, systematic and time efficient manner |
| | | 2.2 | Clean and store die according to workplace procedures applying corrosion protection if required. |
| | | 2.3 | Prepare the moulding machine according to procedures |
| | | 2.4 | Attach replacement die to the machine according to procedures |
| 3 | Set advanced or complex die | 3.1 | Set machine conditions for new die |
| | | 3.2 | Restart machine in accordance with procedure |
| | | 3.3 | Dry cycle machine and die according to enterprise procedures |
| | | 3.4 | Check operation of die and power and control devices against die set up specifications. |
| | | 3.5 | Check the first-off sample for compliance with required standards |
| | | 3.6 | Fine tune settings and other production variables as required |
| | | 3.7 | Note any equipment variances between actual production and documented set up conditions |
| | | 3.8 | Complete workplace documentation and report to appropriate personnel |
| 4 | Anticipate die setting problems | 4.1 | Identify potential problems which may occur during the die changing and setting process |
| | | 4.2 | Determine possible causes of these problems |
| | | 4.3 | Identify most likely causes and prioritise appropriate actions |

- 4.4 Rectify problems using appropriate solutions within area of responsibility
- 4.5 Recommend improvements in systems or procedures

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:

- 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.

Die A die is a former used to give shape to the product and used under pressure. Dies are typically used in the extrusion, injection, blow moulding and general rubber sectors.

Dies which are not subject to pressure are referred to as ‘moulds’ in this Training Package.

Advanced die An advanced die is a two or three plate die which has one or more product forming components which:

- move in a direction other than the mould open axis
- are driven by the mould rather than external actuation.

An advanced die will typically feature one or more of:

- sliding blocks or cores actuated by skew pins or cams
- baffled, spiral, tube, and heat pipe cooling systems
- rising cores
- internally actuated unscrewing systems.

Complex die A complex die is either:

- a die which has one or more product forming components that:
- use an external power and control source to actuate product forming components
- move in a direction other than the mould open axis
- require sequencing with the mould operation
- a mould which retains molten material within the mould between cycles.

A complex die will typically feature one or more of:

- hot runners
- insulated runners
- externally actuated sliding blocks, cores and unscrewing systems
- safety interlocks.

Tools and equipment

Tools and equipment include:

- dies/tools
- ancillary equipment, including one or more of:
 - hot-runner temperature control
 - hydraulic or pneumatic power supply for actuation of equipment, such as cores or sliding blocks
 - mould temperature control
- hand/power tools used in this 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
- 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 PMBTECH402B Set advanced or complex dies

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 PMBTECH402 Set advanced or complex dies

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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 and product specifications, instruments/control panels and data
- plan and prepare for die changeover
- remove, clean and store die according to procedures
- place, attach and adjust die to specifications
- make hydraulic, pneumatic and electrical connections as required
- set machine conditions for new die
- monitor key variables, including:
 - alignment and fitting to patens
 - stability during production
 - fine adjustments of die movements to optimise production
 - die temperature control
 - die component stroke
 - clamping force
 - speeds
 - pressure
 - sequencing
 - interlocks
 - machine pressure, sequencing and interlocks
- check the installation and operation of new die to identify conformance and/or non-conformance to specifications
- make adjustments to settings and equipment operation to rectify variations in equipment operation or product quality
- identify hazards and apply relevant hazard controls
- distinguish between causes of problems, such as:
 - operational problems
 - instrument failure/malfunction
 - hydraulic failure/malfunction
 - pneumatic failure/malfunction
 - electrical failure/malfunction

- mechanical failure/malfunction
- wrong readings
- wrong dies
- wrongly set die
- worn or damaged die
- non-optimum process conditions
- incorrect material type or poor quality
- equipment design deficiencies
- resolve non-routine problems

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 and features of advanced/complex dies, including
 - sliding blocks or cores actuated by skew pins or cams
 - baffled, spiral, tube, and heat pipe cooling systems
 - rising cores
 - internally actuated unscrewing systems
 - external power and control sources,
 - externally actuated sliding blocks, cores and unscrewing systems
 - safety interlocks
- die setting procedures for advanced/complex dies
- verification procedures for advanced/complex dies
- impact of incorrect or faulty fitting
- settings and adjustments of equipment, machine components and ancillary equipment in fine tuning dies
- 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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