



Australian Government

Department of Education, Employment and Workplace Relations

PMBPREP304C Set a die

Revision Number: 1

PMBPREP304C Set a die

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the removal, refitting and setting of dies in preparation for production. It applies typically to the moulding areas of the industry such as injection moulding, and blow moulding.

For setting dies for extrusion, cabling and blown film, use *PMBPREP305B Change extrusion die and calibration set-up*. For changing moulds for rotational moulding or thermoforming, use *PMBPROD282B Assemble mould*. For quick change of dies, use *MCMT220A Apply quick changeover procedures*.

This competency is typically performed by advanced operators or operators demonstrating some relevant theoretical knowledge and using a range of well-developed skills requiring some discretion and judgement.

Application of the Unit

Application of this unit

This competency applies to advanced operators or operators who set dies in preparation for the production process. The job involves the die change and the setting of moulding conditions or program for the new die, and can include nozzle change, die tooling changing, screw cleaning and connection of ancillary equipment. The key factors are the safe, precise and efficient removal of dies and the correct installation and setting ready for production. It includes:

- planning and preparing the change including informing others
- selecting dies, tools and parts that are required for the die changeover
- removing, cleaning and storing the existing dies
- accurately attaching the replacement die according to specification
- accurately setting the machine conditions for the new die
- checking the die and process for efficient operation and making appropriate adjustments.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

People being trained in this unit who do not have an appropriate production or trade background may require extra time allowance.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Prepare to change dies.	1.1 Determine when changeover will be required, and plan requirements for die change. 1.2 Obtain dies and or cores and all parts and tools to match the production order. 1.3 Follow procedure for machine close-down and for informing relevant personnel. 1.4 Take last-off samples as required for die reports. 1.5 Close down machine in accordance with procedures. 1.6 Prepare machine for changeover in accordance with procedures.
2. Change dies.	2.1 Plan removal process to ensure no damage to self, equipment or others. 2.2 Remove, clean and store die according to workplace procedures applying corrosion protection if required. 2.3 Attach replacement die ensuring that locating devices and marks are matched and securing devices are installed and tightened to specification.
3. Set dies.	3.1 Set machine conditions for new die. 3.2 Restart machine as per procedure. 3.3 Dry cycle machine and die according to enterprise procedures. 3.4 Check operation of die against product quality 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

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

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit. Competence in this unit includes the ability for the practical completion of the job to apply and/or explain the:

- organisation procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards
- construction of simple dies and their components, including fixed and removable cores, inserts, ejection systems, vents
- methods of connecting dies to machines, such as bolting to platens, slots etc.
- the function of each machine setting and the appropriate ranges of settings for a given die
- equipment and process sufficient to recognise conditions which may lead to out of specification production
- impact of incorrect or faulty fitting
- correct selection and use of equipment and procedures
- hazards of the removal and fitting process and appropriate hazard control procedures
- relevant information and workplace records
- safety precautions appropriate to the task.
- use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task.

It also requires skills in the safe, precise and efficient removal of simple dies and their correct installation and the ability to plan their own work, including predicting consequences and identifying improvements.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical production orders and die set-up information.

Writing is required to the level of completing workplace forms and production reports.

Basic numeracy is required, eg to monitor and set displays, gauges and dials to correct values according to set-up sheet.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the ability to change and set a die in a manner which will put the moulding machine back into full production of in specification product in standard time. In particular it is essential that the operator can:

- select, install and check the performance of dies and cores
- apply safety precautions appropriate to the task
- recognise potential situations requiring action and then implement appropriate action.

Consistent performance should be demonstrated. For example, look to see that:

- standards are met consistently
- problems are appropriately resolved.

Assessment method and context

Assessment will occur on equipment using simple dies and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate, industrial moulding machine requiring demonstration of die change and die setting procedures
- in a situation allowing the generation of evidence of the ability to perform die change and die setting procedures and to recognise and resolve problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required.

Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency unit includes the setting and removal of simple dies. It does not include advanced and complex dies

This competency applies to all work environments and sectors within the plastics, rubber and cabling industry which use moulding dies. It includes the operation of all relevant ancillary equipment.

Die

A former used to give the required shape to the product and used under pressure. Dies are typically used in the extrusion, injection, blow moulding and general rubber sectors. Dies used which are not subject to pressure are referred to as 'moulds' in this Training Package.

Simple die

A two plate die including any ejection system operating in the mould open axis, but excluding moulds with molten material retained within the mould between cycles. Products are simple, straight drawn items. Typical features may include: force, cavity, back plates, support plates, cold runner, sprue, nozzle seat, locating ring-tab, sub, fan, diaphragm and direct gating, ejector pins and sleeves, ejector plate and stripper plate, simple drilling for mould cooling.

Advanced die

A two or three plate die with one or more product forming components which move in a direction other than the mould open axis, and which are driven by the mould rather than external actuation. Excludes moulds which retain molten material within the mould between cycles. Typical features may include: sliding blocks or cores actuated by skew pins or cams; baffled, spiral, tube, and heat pipe cooling systems; rising cores; and internally actuated unscrewing systems.

Complex die

Dies which use at least one external power and control source to actuate product forming components, which move in a direction other than the mould open axis, and require sequencing with the mould operation. Includes moulds which retain molten material within the mould between cycles. Typical features may include: hot runners; insulated runners; externally actuated sliding blocks, cores, and unscrewing systems; safety interlocks.

Requirements

Requirements for the die change may include checking the die dimensions such as mould height and required ejector stroke to ensure it is compatible with the selected machine

Setting

Setting of the machine conditions may include setting the mould height on the machine, the clamp force, the mould safety system, the ejector system, the mould opening and closing distances, speeds and forces and the injection unit.

These settings may be performed automatically, using an electronic storage device to load settings from a previous run of this product, or may be performed by manually setting controls individually.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This unit of competency includes use of equipment and tools such as:

- hand carts and trolleys
- hoists/lifting equipment not requiring any special permits or licences
- basic hand tools
- relevant personal protective equipment.

Hazards

Typical hazards include:

- hazardous materials
- manual handling hazards
- hot surfaces.

Anticipate problems

Anticipate problems includes taking a proactive approach to a wide range of routine and non-routine problems, using product and process knowledge to develop solutions to problems which do not have a known solution/a solution recorded in the procedures, and endeavouring to learn from the problem so that it does not recur.

Typical die setting problems may include:

- lack of cleaning of die surface and cooling channels, leading to corrosion
- inadequate fitting of the dies to the platens, causing poor alignment or movement during production
- fine adjustments of die movements, to optimise production.

All operations are performed in accordance with procedures.

Variables

Key variables, and their causes, to be monitored include:

- time/effort required to set a die
- number of attempts to produce a first off within specification
- the need to reset/adjust a die during then production run.
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Unit Sector(s)

Not applicable.