



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **PMBPROD314C Produce compression moulded products**

**Revision Number: 1**

## **PMBPROD314C Produce compression moulded products**

### **Modification History**

Not applicable.

### **Unit Descriptor**

#### **Unit descriptor**

This competency covers the operation and adjustment of compression moulding processes and the solving of non-routine problems.

### **Application of the Unit**

#### **Application of this unit**

This competency is typically performed by advanced operators applying knowledge of materials, product purpose and processes to the operation of compression moulding equipment to produce product conforming to requirements. It also requires using a range of well developed skills requiring some discretion and judgement to recognise and resolve a range of problems.

It includes

- checking settings and adjustments of equipment
- checking materials for conformity to job requirements
- monitoring equipment operation
- making appropriate adjustments to correct materials, equipment or process variations
- solving routine and non-routine compression moulding equipment and process problems, seeking guidance where necessary or appropriate.
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### **Licensing/Regulatory Information**

Not applicable.

## Pre-Requisites

### Prerequisites

This unit has **no** prerequisites.

## Employability Skills Information

### Employability Skills

The required outcomes described in this unit contain applicable Employability Skills. The Employability Skills Summary of the qualification(s) in which this unit is packaged will assist in identifying Employability Skill requirements.

## Elements and Performance Criteria Pre-Content

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
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

<b>ELEMENT</b> ELEMENT	<b>PERFORMANCE CRITERIA</b> 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. Plan own work requirements.	1.1 Identify equipment and processes used for production process and upstream and downstream operations from production plan or request. 1.2 Identify and check materials required. 1.3 Implement measures to control identified hazards in line with procedures and duty of care. 1.4 Identify requirements for materials, quality, production and equipment checks.
2. Check compression moulding process set-up to procedures.	2.1 Identify process settings required for product. 2.2 Set process to required settings. 2.3 Check materials are correct. 2.4 Take appropriate action for non-conforming materials. 2.5 Set up date, batch and materials markings to specifications, as required. 2.6 Complete pre-start checks. 2.7 Start up press/compression moulding process.
3. Operate and make adjustments as required to the compression moulding process	3.1 Operate compression moulding process, noting key variables. 3.2 Monitor controls/displays/terminals for production and process data. 3.3 Take samples as required and identify product out of specification. 3.4 Monitor product/process quality. 3.5 Make adjustments to remedy faults and non-conformity as required. 3.6 Establish a stable compression moulding process. 3.7 Adjust process to minimise scrap and trim. 3.8 Clean, adjust and lubricate equipment as required. 3.9 Shut down process as required. 3.10 Leave machine in appropriate condition and ready for the next start up.
4. Anticipate and solve problems	4.1 Recognise a problem or a potential problem. 4.2 Determine problems needing priority action.

<b>ELEMENT</b> ELEMENT	<b>PERFORMANCE CRITERIA</b> Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
	4.3 Refer problems outside area of responsibility to appropriate person, with possible causes. 4.4 Seek information and assistance as required to solve problems. 4.5 Solve problems within area of responsibility. 4.6 Follow through items initiated until final resolution has occurred.

## Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of the materials, equipment and process sufficient to recognise material and equipment conditions which may lead to out of specification production. For example changes in press/temperature, pre-scorching of rubber or changes in pressure can all lead to faulty mouldings, but with different properties.

Knowledge of organization procedures, quality requirements at each production stage and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the injection moulding process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Skill to identify the range of possible causes of product faults.

Knowledge as a basis for solving processing and material problems including:

- characteristics of materials and behaviour in relation to heat, pressure and time
- function and operating principles of compression moulding equipment, machine components and ancillary equipment
- impact of machine speed, temperature, pressure, time during cycles on product quality and production output
- compression moulding cycle and the importance of machine set-up and warm-up for effective processing of materials
- impact of variations in raw materials and equipment operation in relation to final product
- changes to materials at various stages of production
- quality requirements at each production stage
- identify and read transducers for hydraulic position and clamping force
- distinguish between causes of faults
- polymer properties and their interactions with process conditions
- relationships between polymer properties and process conditions
- changes to polymer properties to better suit process requirements.
- product problems related to polymer properties
- product problems related to process conditions
- adjustments to process conditions to meet polymer and product requirements.

Competence also includes the ability to:

- plan own work sequence, including identification of key checkpoints for equipment monitoring, product quality checks and monitoring of supplies and downstream operations
- maintain output and product quality using appropriate instruments, controls, test information and readings
- identify and describe own role and role of others involved directly in the compression moulding process
- identify factors which may affect product quality or production output and appropriate remedies
- identify when the operator is able to rectify faults and when assistance is required.

### Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms and production reports. Basic numeracy is required, eg, to determine the size/weight of blanks and how many moulded products can be obtained from a batch/tray of green rubber.

## 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 knowledge and skills defined in this unit. These may include the ability to:

- identify critical materials properties and compression moulding process characteristics in relation to the process requirements and the end product.

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

- production quality and output standards are met consistently
- the process runs consistently and smoothly.

### Assessment method and context

Assessment will occur on an industrial compression moulding equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate, industrial compression moulding machine requiring demonstration of start up, operation and shut down procedures
- in a situation allowing for the generation of evidence of the ability to respond to 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 applies to all compression moulding within the plastics and rubber industries. It includes the operation of all relevant additional equipment where that equipment is integral to the moulding process.

### Procedures

All operations are performed in accordance with procedures.

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

- original manufacturer instructions and guidelines for the use of the moulding equipment
- relevant procedures relating to safe working practices prescribed for the equipment
- local OHS legislation and/or Regulations
- site-specific instructions based on production requirements.

### Tools and equipment

This competency includes use of equipment and tools such as:

- knives/scissors
- scoops, measures, scales, fixed gauges
- levers and other mould handling devices
- mould release sprays or other means of application
- relevant personal protective equipment.

### Hazards

Typical hazards include:

- fumes/vapours
- crushing hazards
- temperature
- hazardous materials
- manual handling hazards



- equipment operations.

### **Problems**

'Anticipate and solve problems' means resolve 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.

Typical process and product problems may include:

- variations in materials/scorchy rubber
- contamination of materials
- blank/charge/shot size
- mould temperature/temperature
- profile demoulding
- dirty moulds, damaged moulds.

### **Causes of faults**

Causes of faults include:

- wrong raw materials
- incorrect quantity of materials
- contaminated materials
- dirty mould; damaged mould
- mould open too long
- mould/product temperature/temperature profile
- pressure.

### **Variables**

Key variables to be monitored include:

- operating temperatures
- colour
- cycle time
- output rate
- product weight
- product integrity and general conformance to specification/sample.
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### **Unit Sector(s)**

Not applicable.