



Australian Government

Department of Education, Employment and Workplace Relations

PMBPROD210B Operate injection moulding equipment

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the operation of injection moulding equipment and the resolving of routine problems to procedure.

Application of the Unit

Application of this unit

This competency applies to operators who are required to undertake the routine operation of injection moulding equipment. This competency is typically performed by operators working either independently or as part of a work team. The operator:

- takes product off the machine
- checking product for quality and conformity to specifications
- checks raw material feed
- notices any problems and takes required action (e.g.reporting)
- deal with non-conforming products, waste and scrap
- completes logs and reports.

They may record key variables such as machine conditions and production rate and reasons for interruptions.

This unit does not include:

- packing of product - see MSASUP204A Pack products or materials
- finishing of product - see PMBFIN201 Finish products and components
- startup and adjustment.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

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. Check work requirements.	1.1 Identify work requirements from production plan or request. 1.2 Check product, materials and equipment meet requirements for job(s). 1.3 Recognise requirements which may not be in accordance with usual practice. 1.4 Ask questions of appropriate person to confirm unusual practice. 1.5 Ensure housekeeping is to requirements. 1.6 Identify hazards associated with the job and take appropriate action. 1.7 Perform other pre-operational checks in accordance with procedures.
2. Operate injection moulding equipment to procedures.	2.1 Check process is operating within required limits. 2.2 Check product is in specification and to required quality standard. 2.3 Ensure product is consistently ready for next operation. 2.4 Maintain supply of material(s) as required. 2.5 Complete logs and records as required. 2.6 Collect and segregate scrap, trim and other materials as required. 2.7 Keep equipment and work area clean . 2.8 Pause machine cycle and perform emergency stop, as required.
3. Respond to routine problems to procedures.	3.1 Recognise known faults that occur during the operation. 3.2 Identify and take action on causes of routine faults. 3.3 Log problems as required. 3.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

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

Application of an operational knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults. For example if all products are suddenly short (underfilled) for several cycles and getting shorter, this could mean that there is insufficient polymer flow, which could be due to a broken heater band etc. The heater bands would all be checked to ensure proper functioning.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards. For example when monitoring process conditions, action must only be taken if the cushion varies by more than say 2mm.

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

Knowledge of and skills in the operation of injection moulding equipment and main components sufficient for consistent production of quality products including:

- production workflow sequences and materials demand
- the reasons for checking process control panels and reporting readings which are outside of normal range of process variability
- accurately monitoring equipment operation and product quality
- the potential effects of variations in raw materials and equipment operation in relation to quality of product
- processing behaviour of polymers and the role of additives
- waste management and knowing the importance of reusing non-conforming products wherever possible
- correct selection and use of equipment, materials, processes and procedures
- explain the effect of unauthorised or emergency shutdown in relation to safety and production requirements
- identify factors which may affect product quality or production output and appropriate remedies.

Competence also includes the ability to:

- plan own work including predicting consequences and identifying improvements
- identify when the operator is able to rectify faults, when assistance is required and who is the appropriate source for assistance
- identify and describe own role and role of others involved directly in the injection moulding process.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, basic machine control panels, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, eg to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

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:

- apply the required skills and knowledge to operate an injection moulding machine
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see that injection moulding production standards are met consistently.

Assessment method and context

Assessment will occur on an industrial injection moulding machine(s) equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- on a processing plant, allowing for operation under all normal and a range of abnormal conditions
- 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 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 injection moulding operations within the plastics and rubber sectors. It includes the operation of all relevant additional equipment where that equipment is integral to the injection moulding process.

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:

- injection moulding machines (such as electrical, mechanical, electromechanical and hydraulic)
- components of injection moulding machines (such as base, material supply systems, barrel and screw plastification unit, injection units)
- dies/tools (such as pneumatic, or hydraulic actuation of cores, slides ejector systems)
- ancillary equipment (such as chillers, die heating equipment, hopper driers, mixing hoppers, dehumidifying driers, air compressors, dosing machines, blending and mixing equipment and conveyors where they are integral to the operation of the injection moulder)
- hand tools used in the injection moulding process
- material loading equipment used for loading of raw materials
- relevant personal protective equipment.

Hazards

Typical hazards include:

- spills
- dusts/vapours
- slip and fall (such as due to spilt granules)
- temperature (such as due to heated barrel, nozzle and hot runner moulds)
- hazardous substances (including decomposing polymer during start up and shut down)
- moving equipment (such as moving moulds, robots and ancillary equipment)
- manual handling hazards.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process problems may include:

- equipment malfunction
- variations in cycle time, temperature, pressure, speed
- variations in materials or contamination of materials
- die/tooling problems such as damage to die.

Typical product problems may include routine injection moulding faults such as:

- short mouldings
- flash
- sink marks
- voids
- burn marks
- splay/splash marks/silver streaking
- blistering
- flow marks
- poor surface finish
- weld lines
- poor colour dispersion
- colour contamination
- black spots
- ejection damage.

Appropriate action for non-routine problems may be reporting to designated person or other action specified in the procedures.

Unit Sector(s)

Not applicable.