



**Australian Government**

# **PMBPROD310 Produce injection moulded products**

**Release: 1**

## **PMBPROD310 Produce injection moulded products**

### **Modification History**

Release 1. Supersedes and is equivalent to PMBPROD310C Produce injection moulded products

### **Application**

This unit of competency covers the skills and knowledge required to operate and adjust injection moulding processes to produce product.

This unit of competency applies to experienced operators who are required to start up and shut down injection moulding equipment, monitor equipment operation, establish a stable process, make adjustments to remedy faults and non-conformity, and solve problems within area of responsibility.

This unit of competency applies to an experienced operator demonstrating theoretical and technical knowledge and well developed skills in situations that require some discretion and judgement. The operator 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**

PMBPROD210 Operate injection moulding equipment

### **Competency Field**

Production

### **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 | <b>Plan own work requirements</b>                                                   | 1.1 | Identify the most appropriate equipment to be used for production and upstream and downstream operations from production plan or request |
|   |                                                                                     | 1.2 | Identify and check materials required, including additives and regrind and their amounts or percentages                                  |
|   |                                                                                     | 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 | <b>Start up injection moulding process to procedures</b>                            | 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 injection moulding process                                                                                                      |
|   |                                                                                     |     |                                                                                                                                          |
| 3 | <b>Operate and make adjustments to the injection moulding process to procedures</b> | 3.1 | Operate injection 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 nonconformity as required                                                                          |

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|---|----------------------------------------|-----|-------------------------------------------------------------------------------------------|
|   |                                        | 3.6 | Establish a stable injection moulding process                                             |
|   |                                        | 3.7 | Adjust process to minimise scrap and trim                                                 |
|   |                                        | 3.8 | Clean, adjust and lubricate equipment as required                                         |
| 4 | <b>Shut down machine to procedures</b> | 4.1 | Determine type of shutdown                                                                |
|   |                                        | 4.2 | Select appropriate purging method                                                         |
|   |                                        | 4.3 | Purge efficiently and adequately as required                                              |
|   |                                        | 4.4 | Leave machine in appropriate condition and with appropriate locks, tags or notices        |
|   |                                        | 4.5 | Complete relevant documentation                                                           |
|   |                                        | 4.6 | Ensure area is clean and clear after the shutdown, in readiness for the next start-up     |
| 5 | <b>Anticipate and solve problems</b>   | 5.1 | Recognise a problem or a potential problem                                                |
|   |                                        | 5.2 | Determine problems needing priority action                                                |
|   |                                        | 5.3 | Refer problems outside area of responsibility to appropriate person, with possible causes |
|   |                                        | 5.4 | Seek information and assistance as required to solve problems                             |
|   |                                        | 5.5 | Solve problems within area of responsibility                                              |
|   |                                        | 5.6 | Follow through items initiated until final resolution has occurred                        |

## 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:

- 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.

**Tools and equipment** Tools and equipment include:

- injection moulding machines which may be electrical, mechanical, electromechanical or hydraulic

- components of injection moulding machines, including material supply systems, plastification unit, dies/tools and injection units
- ancillary equipment that is integral to the process, including one or more of:
  - chillers
  - die heating equipment
  - hopper driers
  - mixing hoppers
  - dehumidifying driers
  - air compressors
  - dosing machines
  - blending and mixing equipment
  - conveyors.

Additional tools and equipment will be selected as required from:

- hand tools used in this process
- 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, vapours 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.

## **Problems**

Non-routine problems must be resolved by applying operational knowledge to develop new solutions, either individually or in collaboration with relevant

experts, to:

- determine problems needing action
- determine possible fault causes
- develop solutions to problems which do not have a known solution
- follow through items initiated until final resolution has occurred
- report problems outside area of responsibility to designated person.

Non-routine problems are unexpected problems or variations of previous problems and include one or more of:

- unstable process variables
- sub-optimal operation
- variations in feed rates
- variations in quality
- emergency situations
- release problems
- distortion of product upon ejection
- warping or cracking after moulding
- residual stresses
- intermittent faults.

Operational knowledge includes one or more of:

- procedures
- training
- technical information, such as journals and engineering specifications
- remembered experience
- relevant knowledge obtained from appropriate people.

## Unit Mapping Information

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## Links

MSA Training Package Implementation Guides - <http://mskills.org.au/training-packages/info/>