



Australian Government

Department of Education, Employment and Workplace Relations

PMBPROD311C Produce blow moulded products

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor

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

This competency is typically performed by advanced 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 operators who are required to apply knowledge of materials, product purpose and processes to the operation of blow moulding equipment. The key factors are the production of material meeting quality standards and product requirements and the recognition and resolving of a range of routine and non-routine problems.

The operator will:

- start up and shutdown the blow moulding equipment
- check settings and adjustments of equipment
- monitor blow moulding equipment operation
- make appropriate adjustments to correct materials, equipment or process variations
- solve blow moulding machine, material and process problems, seeking guidance where necessary or appropriate.

This unit does not include die changes - see *PMBPREP304C Set a die*.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit of competency has the prerequisite of *PMBPROD211A Operate blow moulding equipment*.

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

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. Plan own work requirements.	1.1 Identify the most appropriate equipment to be used for production process, 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. Start up blow moulding equipment to procedures.	2.1 Identify process settings required for product. 2.2 Set up and adjust blow moulding equipment for shot size, parison control, die gap, temperature, screw speed, cycle speed, slow close setting (or cushion) and timing. 2.3 Check safety gates and guards are located in their correct working positions and emergency stops are identified and checked as required. 2.4 Verify equipment, raw material and <u>mould</u> all match job requirement. 2.5 Set up date, batch and materials markings. 2.6 Complete other pre-start checks. 2.7 Start up equipment safely and 'dry run' to warm hydraulics and components to operating temperature before production, as required.
3. Operate and make adjustments to the blow moulding process to procedures.	3.1 Check condition of equipment and introduce raw materials as required. 3.2 Operate blow moulding equipment, noting key variables 3.3 Monitor controls/displays/terminals for production and process data. 3.4 Monitor product/process quality. 3.5 Make adjustments to remedy faults and nonconformity as required. 3.6 Establish a stable blow moulding process. 3.7 Collect and reprocess/discard scrap/trim and other

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	materials. 3.8 Clean, adjust and lubricate equipment as required. 3.9 Complete logs and records as required. 3.10 Pause or stop equipment in an emergency, as required.
4. Anticipate and solve problems.	4.1 Recognise a problem or a potential problem. 4.2 Determine problems needing priority action. 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. 4.4 Solve problems within area of responsibility. 4.5 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 foreign material in the polymer feed leading to black spots in the product.

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 blow moulding process. Application of approved hazard control, safety procedures, the use of PPE in relation to handling materials, equipment operation and cleanup.

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

- characteristics of materials and behaviour in relation to heat, pressure, flow rate and time
- function and operating principles of blow moulding equipment, machine components and ancillary equipment
- purpose and requirements of 'dry running' before process materials are introduced
- impact of blow moulding machine speed, temperature, blow pressure, sequence time, parison control, on product quality and production output
- nature of mechanical, hydraulic, pneumatic, electrical and electronic principles which affect machine operation and product development
- processing behaviours of the materials blow moulded in the workplace
- impact of variations in raw materials and equipment operation in relation to final product
- changes to materials at various stages of production
- waste management and importance of non-conforming materials
- 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, including predicting consequences and identifying improvements
- 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 extrusion process
- identify factors which may affect product quality or production output and appropriate remedies
- identify when assistance is required to solve problems.

Distinguish between causes of faults such as:

- routine blow moulding faults - burn marks, flow marks, poor surface finish, poor colour dispersion, blistering, colour contamination, black spots
- incorrect quantity of materials
- contaminated materials/additives
- equipment faults.

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 how many 2 kg, 3 kg and 5 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.

Where the assessee does not currently possess evidence of competency in *PMBPROD211B Operate blow moulding equipment*, it may be co-assessed with this unit.

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 blow moulding process characteristics in relation to the process requirements and the end product
- plan own work process within workplace procedures and explain the reasons for the steps in the process
- take appropriate action to observe equipment, materials and products for out of specification results, make adjustments and identify problems to be reported.

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

- production quality and output standards are met consistently
- problems are anticipated from process observations
- problems are efficiently resolved
- the process runs consistently and smoothly.

Assessment method and context

It is preferred that assessment takes place on an industrial blow moulding machine 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 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 blow moulding within the plastics and rubber industries. It includes the operation of all relevant additional equipment where that equipment is integral to the blow 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 competency includes use of equipment and tools such as:

- bottom blow, top blow, needle blow, tail to tail blow, parison pre-blow and pre-squeeze, parison stretching and parison orientation type machines
- additional equipment, including chillers/cooling towers, die heating equipment, hopper driers, mixing hoppers, dehumidifying driers, air compressors, dosing machines, colour blending equipment and conveyors
- hand tools as required
- material loading equipment for raw materials
- relevant personal protective equipment.

Hazards

Typical hazards include:

- spills
- dusts/vapours
- slip and fall, particularly due to spilt granules
- temperature
- hazardous materials
- manual handling hazards
- equipment operations.

Problems

Respond to/rectify 'non-routine problems' means 'apply known solutions to a variety of predictable problems'. Typical process and product problems may include:

- equipment malfunction
- variations in temperature, pressure, speed, inflation
- variations in materials or contamination of materials
- mould damage
- routine blow moulding faults - wall thinning, holes, poor surface finish, warping, poor colour dispersion, ejection damage, colour contamination, black spots and other defects
- machine malfunction
- mould/tooling problems.

Variables

Key variables to be monitored include:

- operating temperatures
- speed
- cycle time
- output rate
- concentration or dispersion of colour
- product weight
- product wall thickness
- product integrity and general conformance to specification/sample.
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Unit Sector(s)

Not applicable.