Australian Government

Department of Education, Employment and Workplace Relations

PMBPROD321B Produce rotational moulded products

Revision Number: 1

PMBPROD321B Produce rotational moulded products

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the operation and adjustment of rotational moulding processes and the solving of non-routine problems. This does not cover open flame equipment.

This competency is typically performed by 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 rotational 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.

It includes:

- identifying and planning own work requirements from production requests
- identifying and minimising any hazards connected with materials and process from materials safety data sheets, labels and workplace procedures
- checking settings and adjustments of equipment
- checking materials for conformity to job requirements
- monitoring equipment operation and correcting process variations
- correcting materials, equipment or process variations and making appropriate adjustments
- discarding non-conforming products ensuring discarded materials are reused where possible and waste and scrap is disposed of in accordance with workplace instructions
- solving routine and non-routine rotational moulding equipment and process problems, seeking guidance where necessary or appropriate
- completing logs and reports.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites
This unit of competency has the prerequisite of *PMBPROD221A Operate rotational 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	PERFORMANCE CRITERIA
ELEMENT	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 materials required, including additives. 1.3 Recognise hazards and follow appropriate hazard control/minimisation methods. 1.4 Identify and check emergency stops, safety gates, guards and controls. 1.5 Identify requirements for materials, quality, production and equipment checks. 1.6 Identify materials, waste management and housekeeping needs.
2. Start up rotational moulding process.	2.1 Determine equipment requirements. 2.2 Set process to specifications as required. 2.3 Check rotational moulding equipment settings and adjustments are as required. 2.4 Check materials are correct. 2.5 Discard, or make adjustments to the process for, non-conforming materials. 2.6 Set up date, batch and materials markings to specifications, as required. 2.7 Complete other pre-start checks in accordance with procedures. 2.8 Start up rotational moulding process.
3. Operate and make adjustments as required to the rotational moulding process.	3.1 Operate rotational moulding equipment, noting key variables. 3.2 Monitor controls/displays/terminals for production/process data. 3.3 Monitor product/process quality in accordance with procedures. 3.4 Make adjustments to remedy faults and nonconformity to standard as required. 3.5 Maintain continuity of process. 3.6 Collect and reprocess/discard scrap/trim and other materials in accordance with procedures.

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.
	3.7 Clean, adjust and lubricate equipment as required. 3.8 Pause equipment, or stop equipment in an emergency, following workplace and emergency procedures.
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. 4.5 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.
Knowledge of organization procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.
Competence includes the ability for the practical completion of the job toapply and/or explain:

- products, materials and material characteristics
- behaviour of materials in relation to heat, rotation and time
- quality requirements at each production stage
- function and operating principles of rotational moulding equipment, machine components and ancillary equipment
- impact of machine speed, temperature, time during heating and cooling cycles on product quality and production output
- nature of mechanical, hydraulic, pneumatic, electrical and electronic principles which affect machine operation and product development
- rotational moulding cycle and the importance of machine set-up and warm-up for effective processing of materials
- safety procedures and the use of PPE in relation to handling materials, equipment operation and clean up
- the hierarchy of control including engineering controls
- impact of variations in raw materials and equipment operation in relation to final productchanges 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
- interpret from production requests the correct selection and use of equipment, materials, processes and procedures
- maintain output and product quality using appropriate instruments, controls, test information and readings
- 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
- distinguish between causes of 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.

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 rotational 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 rotational 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 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 rotomoulding systems, including fixed spindle, single spindle, multiple spindle and shuttle, swing and carousel type machines. It includes the operation of all relevant additional equipment where that equipment is integral to the rotational 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:

- hand tools used in the rotational moulding process
- material loading equipment used for loading of raw materials
- relevant personal protective equipment.

Hazards

Typical hazards include:

- noise, light, energy sources
- manual handling
- humidity, air temperatures, radiant heat, hot moulds
- stationary and moving machinery, parts and components.

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:

- routine and non-routine product rotational moulding faults
- machine malfunction
- mould/tooling problems
- variations in materials and/or contamination of materials
- processing problems.

Causes of faults

Causes of faults include:

- short mouldings
- sink marks
- voids
- burn marks
- mica
- splash marks
- warping
- silver streaking
- blistering
- flow marks
- poor surface finish
- windows
- erratic cycles
- poor colour dispersion
- rotation damage
- colour contamination
- black spots
- incorrect quantity of materials
- contaminated materials.

Variables
Key variables to be monitored include:

- cycle time according to external temperatures and humidity
- operating temperatures
- type of heating used
- cooling time
- speed of rotation/movement
- pattern of movement
- colour of product
- product integrity and general conformance to specification/sample.
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Unit Sector(s)

Not applicable.