Australian Government

Department of Education, Employment and Workplace Relations

PMBPROD352A Produce compounded materials

Revision Number: 1

PMBPROD352A Produce compounded materials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor
This competency covers the operation and adjustment of compounding equipment and the solving of non-routine problems.

Application of the Unit

Application of this unit
This competency is typically performed by advanced operators apply knowledge of materials, product purpose and processes to the operation of compounding equipment. It also requires using a range of well developed skills required some discretion and judgement to recognise and resolve of a range of problems.
The operator will:

- start up the compounder
- identify and plan own work requirements from production requests
- check settings and adjustments of equipment
- monitor equipment operation
- make appropriate adjustments to materials, equipment or process variations
- solve compounding equipment and process problems, seeking guidance where necessary or appropriate
- complete logs and reports.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites
This unit has the prerequisite of *PMBPROD252C Operate compounding 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 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. 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 compounding equipment to procedures.	2.1 Determine machine/equipment requirements. 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 compounder.
3. Operate and make adjustments to the compounding process to procedures.	3.1 Operate compounding process, noting key variables. 3.2 Monitor controls/displays/terminals for production/process data. 3.3 Take samples as required and identify product out of specification. 3.4 Monitor product quality. 3.5 Make adjustments to remedy faults and nonconformity to standard as required. 3.6 Establish a stable compounding process. 3.7 Adjust process to minimise scrap. 3.8 Clean, adjust and lubricate machine/equipment as required.
4. Shut down machine to procedures	4.1 Determine type of shut down 4.2 Select appropriate purging method. 4.3 Purge efficiently and adequately as required. 4.4 Leave machine in appropriate condition and with

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.
	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. Anticipate and solve problems	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.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.
Application of knowledge of all compounds, materials, equipment and process sufficient to recognise compound, material and equipment conditions which may lead to out of specification production.
Knowledge of organization procedures, quality requirements at each production stage, relevant regulatory requirements (eg quality system and standards, current operating standards) and the ability to implement them within appropriate time constraints and work standards.
Skills to identify the range of possible causes of product faults.

Application of the knowledge of managing risks using the hierarchy of controls applied to compound materials using an internal mill blender. Application of approved hazard control and safety procedures and 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 rates and time
- function and operating principles of compounding equipment, machine components and ancillary equipment, including the mechanical, hydraulic, pneumatic, electrical and electronic principles which affect machine operation
- impact of machine speed, temperature, pressure, time during cycles on product quality and production output
- changes to materials at various stages of production
- waste management and importance of reusing non-conforming materials
- impact of variations in raw materials and equipment operation in relation to final product
- 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 includes the ability for the practical completion of the job 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 internal mill blending process
- identify factors which may affect product quality or production output and appropriate remedies
- identify when assistance is required to solve problems.

Language, **literacy and numeracy requirements**
This unit requires the ability to read and interpret typical product specifications, job sheets and complex machine control panels such as those displaying SPC information.
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. Basic statistical knowledge is required to construct histograms and control charts as well as to interpret results and recommend actions.

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 *PMBPROD252C Operate compounding 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 process characteristics in relation to the process requirements and the end product
- make adjustments to the process as required
- identify and take appropriate action on problems and potential problems.

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

- the process runs consistently and smoothly, with minimum need for human intervention
- all safety procedures are always followed.

Assessment method and context

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

Competence in this unit may be assessed:

- using an appropriate, industrial internal mill blender
- 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 the operation of compounding processes in the plastics and rubber sectors. It includes the operation of all relevant additional equipment where that equipment is integral to the process.
It does not cover the use of internal mills (eg Banburys) or open mills (see relevant units)

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:

- process electrical/mechanical machine and its major components
- hand tools, eg knives
- material loading equipment used for loading of raw materials, eg forklift, lift, hook, takeaway belt
- monitoring equipment and tools, eg scales for weighing powders and rubber
- digital sensors, computer control settings and displays
- recipe cards
- relevant personal protective equipment (PPE).

Hazards
Typical hazards include:

- chemical spills
- dusts/vapours/rubbish
- slip and fall
- 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 *i*) a known solution, *ii*) a solution recorded in the procedures.
Typical process and product problems may include:

- machine malfunction, eg caused by incorrect dip solution/rubber levels
- variations in materials, eg allowable tolerances of cut-up materials contamination of compounds and/or materials
- processing problems
- dust stop leakage
- incorrect quantity of materials
- contaminated materials.

Appropriate action for problems outside of area of responsibility may be reporting to an appropriate person.
Appropriate action for solving problems within area of responsibility includes asking questions and seeking assistance from appropriate persons/sources.
Variables
Key variables to be monitored include:

- temperatures
- speed
- pressures
- colour
- mixing differences/mixing steps/plasticity
- cycle steps/cycle time/process timing
- output rate/machine inactivity
- product weight
- product integrity and general conformance to specification/sample, eg rubber batch differences, batch dump indicators.
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Unit Sector(s)

Not applicable.