



Australian Government

Department of Education, Employment and Workplace Relations

PMBPROD307C Produce calendered products

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor

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

Application of the Unit

Application of this unit

This competency is typically performed by advanced operators applying knowledge of materials, product purpose and processes to the operation of calendering equipment to convert plastic or rubber compound into intermediate or final film/sheet products. It also requires using a range of well developed skills requiring some discretion and judgement to recognise and resolve problems.

The operator will:

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

This unit does not include milling - *PMBPROD354A Compound materials using an open mill blender*.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit of competency has the prerequisite of *PMBPROD207A Operate calender*.

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 equipment and processes used for production process 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 calendering process to procedures.	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 specification as required. 2.6 Complete pre-start checks. 2.7 Start up calendering process
3. Operate and make adjustments to the calendering process to procedures.	3.1 Operate calendering process, noting key variables. 3.2 Monitor controls/displays/terminals for production/process data. 3.3 Monitor product/process quality. 3.4 Take samples as required and identify product out of specification. 3.5 Make adjustments to remedy faults and non-conformity to standard as required. 3.6 Establish a stable calendering process. 3.7 Adjust process to minimise scrap and trim. 3.8 Clean, adjust and lubricate equipment as required.
4. Shut down machine to procedures.	4.1 Determine type of shutdown. 4.2 Select appropriate cleaning method. 4.3 Clean efficiently and adequately as required. 4.4 Leave machine in appropriate condition and with appropriate locks, tags, or notices.

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.
	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 Determine possible fault causes. 5.4 Refer problem outside area of responsibility to appropriate person, with possible causes. 5.5 Seek information and assistance as required to solve problems. 5.6 Solve problems within area of responsibility. 5.7 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 and ability to implement organisation procedures, quality requirements at each production stage and relevant regulatory requirements; within appropriate time constraints and work standards.

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

Knowledge and ability to identify and take appropriate action on the range of possible causes of product faults

Knowledge as a basis for solving process and material problems including:

- characteristics of materials and behaviour in relation to heat, pressure, flow rate and time
- function and operating principles of calendering equipment, machine components and ancillary equipment, including the mechanical, hydraulic, pneumatic, electrical and electronic principles which affect machine operation
- impact of machine settings such as nip setting, speed, temperature, tension etc. on product quality and production output
- processing behaviour of those polymers which are moulded at the workplace
- characteristics of different types of coated materials
- 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 calendering 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, machine control panels, 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 time required to produce product at a give production rate, amount of compound required to produce the required amount of product.

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 *PMBPROD207A Operate calender*, 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 calendering process variables 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 the minimum need for intervention
- all safety procedures are followed.

Assessment method and context

Assessment will occur on a calendering equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate calendering machine requiring demonstration of start-up, operation and shutdown procedures
- 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 all calendering within the plastics and rubber industries. It also includes the operation of all relevant additional equipment, where that equipment is integral to the calendering process.

It includes the calendering of 'solid' polymers as well as the coating/impregnating of fabric, wire and other webs.

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:

- calenders
- additional equipment (such as mill knives, thickness gauges, profiling gauges/tools/jigs, nip adjusting bars, strainers and metal detector)
- manual handling equipment
- product take up equipment
- material feeding equipment
- hoists/lifting equipment not requiring any special permits or licences
- basic hand tools
- relevant personal protective equipment.

Hazards

Typical hazards include:

- restricted spaces
- heat
- hazardous chemicals
- dust/fumes

- manual handling hazards
- knife hazards
- nip hazards
- creel and spooling hazards.

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:

- contamination of materials
- incorrect machine set-up, especially the nip setting tensions
- temperatures
- uniformity of product.

Appropriate action for problems outside 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:

- operating temperatures
- speed
- nip settings
- materials consistency
- surface finish
- product integrity and general conformance to specifications.
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Unit Sector(s)

Not applicable.