



Australian Government

PMBPROD380B Produce composites using chopper gun/depositor

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers preparation and hand operation of a resin-glass depositor (chopper gun) to form a composite materials product and the solving of non-routine problems.

Application of the Unit

Application of this unit

This competency applies to advanced operators who are required to apply knowledge of materials, product purpose and processes to the hand operation of chopper guns/depositors for the production of composites. It also requires using a range of well developed skills requiring some discretion and judgement to recognise and resolve a range of problems.

The operator will:

- check settings and adjustments of equipment
- monitor equipment operation
- make appropriate adjustments to correct materials, equipment or process variations
- solve composites production 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 of competency has a prerequisite of *PMBPROD280A Operate resin-glass depositor 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 equipment and processes to be 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 and check emergency stops, guards and controls. 1.5 Identify requirements for materials, quality, production and equipment checks. 1.6 Identify materials, waste management and housekeeping needs.
2. Set up equipment, mould and materials to procedures.	2.1 Determine equipment requirements. 2.2 Adjust controls as required for factors such as ambient conditions, temperature and materials. 2.3 Check equipment, raw material and mould all match job requirements. 2.4 Check materials, resins, fibres, release agents are correct. 2.5 Take appropriate action for non-conforming materials. 2.6 Set up date, batch and materials markings to specifications, as required. 2.7 Complete pre-start checks.
3. Hand operate chopper gun/depositor.	3.1 Use chopper gun/depositor to apply materials to the mould to procedures. 3.2 Monitor product quality, thickness, colour and integrity. 3.3 Make adjustments to remedy faults and non-conformances as required. 3.4 Collect and segregate scrap, trim and other materials as required. 3.5 Shut off machine safely and correctly as required following procedures.

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. 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 Solve problems within area of responsibility. 4.5 Seek information and assistance as required to solve problems 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, quality requirements at each stage of production 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 composites process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Show knowledge as a basis for solving processing and material problems including:

- operation of resin-glass depositor, equipment and components
- production workflow sequences and materials demand
- properties of the materials required to form a composite structure of the required strength and surface finish, including the importance of gel coat properties and bonding
- requirements for correct spraying of materials to the mould surface
- pot life of the resins used
- cleanout procedures
- impact effects of variations in raw materials and equipment operation in relation to quality of final product
- correct selection and use of equipment, materials, processes and procedures
- 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
- identify and describe own role and role of others involved directly in the process
- 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 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, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Numeracy is required to the level of determining required weights/volumes of materials in a resin mix for different circumstances (say using a data sheet), number of layers of impregnated matrix required to yield the required product laminate thickness, and similar activities.

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 *PMBPROD2980A Operate resin-glass depositor 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 material properties and process variable in relation to the process requirements of 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:

- composites production standards are met consistently
- all safety procedures are always followed.

Assessment method and context

Assessment will occur on chopper-gun depositor equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- using an appropriate processing plant
- in a situation allowing for the generation of evidence of the ability to recognise, anticipate and 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 unit includes the use of equipment and materials to form composite products using a chopper gun/depositor. It includes the operation of all relevant additional equipment where that equipment is integral to the 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:

- open moulds for composite products
- hand tools for mixing and application
- knives and cutters to trim fibres
- chopper gun/depositor, pots, pumps and controls
- relevant personal protective equipment.

Hazards

Typical hazards include:

- spills dusts/vapours
- slip and fall
- temperature
- hazardous substances
- manual handling hazards
- knife hazards.
- moving equipment
- manual handling 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 routine faults such as:

- dry and/or wet laminate
- runs, sags, excessive build-up at edges of mould

- poor surface finish
- release damage
- cracks, dents or imperfections of the mould.

Non-routine faults, which may have multiple causes include:

- release problems
- distortion of product after demoulding
- warping and cracking after demoulding.

Typical process and product problems may include:

- variations in materials, colour, consistency or mix
- variations in temperature, pressures and resin-to-fibre ratios
- contamination of materials
- incorrect quantity of materials
- contaminated materials/additives
- equipment faults
- mould damage
- wrong raw materials/additives
- incorrect quantity of materials/additives
- machine failure.

Variables

Key variables to be monitored include:

- temperatures and humidity of environment
- resin to fibre ratios
- surface finish/appearance
- product integrity and general conformance to specification and quality sample.
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Unit Sector(s)

Not applicable.