



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **PMBPROD293B Operate vacuum bagging equipment**

**Revision Number: 1**

## **PMBPROD293B Operate vacuum bagging equipment**

### **Modification History**

Not applicable.

### **Unit Descriptor**

#### **Unit descriptor**

This competency covers the operation of vacuum bagging equipment for composite products and the resolving of routine problems to procedure in the production process.

### **Application of the Unit**

#### **Application of this unit**

This competency applies to operators who are required to undertake the routine operation of vacuum bagging equipment. This competency is typically performed by operators working either independently or as part of a work team.

The operator will:

- conduct pre-start checks
- check product for quality and conformity to specifications
- check raw materials
- notice any problems and take required action (eg reporting)
- deal with non-conforming products, waste and scrap
- complete logs and reports.
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### **Licensing/Regulatory Information**

Not applicable.

## Pre-Requisites

### Prerequisites

This unit has **no** prerequisites.

## 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

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
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

<b>ELEMENT</b> ELEMENT	<b>PERFORMANCE CRITERIA</b> 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. Check work requirements.	1.1 Identify work requirements from production plan or request. 1.2 Check product, materials and equipment meet requirements for job(s). 1.3 Recognise requirements which may not be in accordance with usual practice. 1.4 Ask questions of appropriate person to confirm non standard job specifications. 1.5 Ensure housekeeping is to requirements. 1.6 Identify hazards associated with job and take appropriate action. 1.7 Perform other pre-operational checks in accordance with procedures.
2. Check process set-up.	2.1 Check safety equipment is in position and working. 2.2 Check moulds, vacuum bag, closures and fittings to procedures. 2.3 Check moulds for cracks, chips, marks and cleanliness. 2.4 Check materials, including fibre preforms, resins, additives and release agents are correct. 2.5 Complete pre-start checks.
3. Operate equipment to procedures.	3.1 Start equipment safely and correctly when required. 3.2 Check process is operating within required limits. 3.3 Collect products and store as required. 3.4 Check product/process is in specification/to required quality standard. 3.5 Maintain supply of material(s) as required. 3.6 Complete logs and records as required. 3.7 Collect and segregate scrap, waste and other materials as required. 3.8 Keep equipment and work area clean. 3.9 shut down as required.
4. Respond to routine problems in accordance	4.1 Recognise known faults that occur during the operation.

<b>ELEMENT</b> ELEMENT	<b>PERFORMANCE CRITERIA</b> Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
with procedures.	4.2 Identify and take action on causes of routine faults. 4.3 Log problems as required. 4.4 Identify non-routine process and quality problems and take appropriate action.

## Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of an operational knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults.

Knowledge of organisation procedures, relevant regulatory requirements and 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 composite 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 of and skills in the operation of vacuum bagging equipment and its main components sufficient for the consistent production of quality products including:

- production workflow sequences and materials demand
- reasons for checking process control panels and reporting readings which do not conform to the work instructions
- accurately monitor equipment operation and product quality
- potential effects of variations in raw materials and equipment operation in relation to quality of product
- operation of vacuum bagging equipment and components
- process behaviours of resins and the role of additives
- waste management and importance of reusing non-conforming products wherever possible
- correct selection and use of equipment, materials, processes and procedures
- explain the effect of unauthorised or emergency shutdown in relation to safety and production requirements
- identify factors which may affect product quality or production output and appropriate remedies.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- identify when the operator is able to rectify faults, when assistance is required and who is the appropriate source for assistance
- identify and describe own role and role of others involved directly in the process.

### 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 reading tables of figures and graphs (and applying the resultant information), using formula percentages/ratios to determine the required mass of an additive (catalyst, pigment etc.) for a given amount of resin, and similar manipulations and interpretation

## 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:

- apply the required skills and knowledge to operate vacuum bagging equipment
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see that production standards are met consistently.

### **Assessment method and context**

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

Competence in this unit may be assessed:

- by using an appropriate industrial vacuum bagging plant requiring demonstration of operation and start/stop 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 a 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 vacuum bagging equipment including moulds, pumps and programmable logic controllers (PLC) if fitted.

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:

- moulds
- vacuum pumps and fittings, such as hoses and couplings
- controller, such as PLC if fitted
- hand tools used in the this process
- material loading equipment used for loading of raw materials
- relevant personal protective equipment.

### **Hazards**

Typical hazards include:

- spills
- dusts/vapours
- slip and fall
- temperature
- hazardous substances moving equipment
- manual handling hazards.

### **Problems**

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process problems may include:

- equipment malfunction
- resin, wet out non conformance of the laminate
- variations in process conditions, especially temperature
- variations affecting cure rate
- variations in materials or contamination of materials
- equipment, tool or mould damage
- routine product faults
- machine malfunction
- mould/tooling problems
- variations in materials and/or contamination of materials.

Appropriate action for non-routine problems may be reporting to designated person or other action specified in the procedures.



## **Unit Sector(s)**

Not applicable.