



Australian Government

Department of Education, Employment and Workplace Relations

PMBPROD242A Bond polymers to surfaces

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the joining of a solid polymer to another solid surface using adhesives, cohesives, solvents or other joining materials. The polymer may be thermoplastic or cured or uncured thermoset.

Application of the Unit

Application of this unit

This competency applies to operators who are required to join polymers to another surface. It is typically performed by operators working either independently or as part of a work team.

The operator will:

- check the surface of products to be joined for suitability or contamination
- check materials for conformity to job requirements
- apply the joining material(s)
- notice any problems and take required actions
- deal with non-conforming products, waste and scrap
- complete logs and reports.

They may record key variables such as work conditions and production rate and reasons for interruptions.

This unit does not include:

- significant surface preparation - see *PMBPROD248C Prepare surfaces for coating*
- heat curing of bonded material - see *PMBPROD265 Operate portable vulcanising equipment*, *PMBPROD375B Vulcanise products using an autoclave*.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

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. Check work requirements.	1.1 Identify work requirements from production plan or request. 1.2 Select and check appropriate equipment or tool/s, techniques and materials to be used. 1.3 Recognise requirements which may not be in accordance with usual practice. 1.4 Ask questions of appropriate person to confirm unusual practice. 1.5 Ensure housekeeping is to requirements. 1.6 Identify hazards associated with the job and take appropriate action. 1.7 Perform other pre-operational checks to procedures
2. Prepare materials for joining.	2.1 Check substrate for suitability. 2.2 Clean/activate substrates to procedures as required.
3. Apply joining materials.	3.1 Prepare joining materials. 3.2 Apply joining materials to substrate(s) as required. 3.3 Monitor drying/setting as appropriate 3.4 Apply subsequent material/coats as required. 3.5 Complete logs and records as required. 3.6 Keep equipment and work area clean.
4. Join materials.	4.1 Set up required jigs and equipment for joining. 4.2 Bring surfaces together when appropriate. 4.3 Ensure intimate and continuous contact between surfaces. 4.4 Apply required conditions to join until joining process is complete.
5. Respond to routine problems in accordance with procedures.	5.1 Recognise known faults that occur during the operation. 5.2 Identify and take action on causes of routine faults. 5.3 Log problems as required. 5.4 Identify non-routine problems and report to designated person.

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 out of specification products, process problems and materials faults.

Knowledge of organisation procedures, quality requirements and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risk using the hierarchy of controls applied to the coating 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 skills in the operation of the joining process and equipment sufficient for consistent production of quality products, including:

- correct selection and use of equipment or tool/s, materials, processes and procedures
- accurately monitoring equipment operation and product quality
- reasons for checking conditions and taking action when outside of the normal range of process variability
- identifying factors which may affect product quality or production output and appropriate remedies
- potential effects of variations in materials and equipment operation in relation to quality of product
- joining behaviour of polymers to relevant substrates and the role of adhesives, cohesives, solvents and other materials
- waste management and knowing the importance of reusing non-conforming products wherever possible
- basic pre-blending of materials
- methods of application of joining materials
- required surface preparations and their importance to joining
- types of adhesives, cohesives, solvents and their differences, uses, where they may or may not be used and range of application
- critical factors for different types of joining processes such as gap filling, aesthetics, structural strength etc.

Competence also includes the ability to:

- plan production workflow sequences and materials demand
- 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 coating 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.

Basic numeracy is required, eg to determine the amounts of materials needing to be blended for a 2 pot adhesive.

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 complete adhesive bonding jobs
- apply approved procedures.

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

- joining production standards are met consistently
- all safety procedures are followed.

Assessment method and context

Assessment will occur using industrial bonding situations and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using appropriate joining materials, situations and tools
- 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 all joining operations where a solid polymer is joined to another substrate. It includes the operation of all relevant additional equipment where that equipment is integral to the joining 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.

Substrate suitability

Substrate suitability includes:

- surface soundness
- surface preparation such as grit blasting, etching, sanding, buffing, scraping, machining or other preparations
- substrate porosity
- surface pits, protrusions or other irregularities.

Joining materials

Joining materials include:

- adhesives (such as commercially available materials 'Loctite, Sikaflex, Plexus)
- cohesives
- solvents (such as aliphatics, ketones, aromatics)
- other materials (such as glues, fillers)

Joining material preparation

Joining material preparation includes:

- mixing one pot materials to achieve homogeneity
- blending two (or more) pot material components
- thinning (eg with solvent) if required
- measuring components for blends.

Joining material application

Joining material application to include:

- correct application rate
- even application
- economical application
- correct application method.

Contact between surfaces

Contact between surfaces may be effected by:

- use of hand rollers
- use of presses
- may be achieved as part of the curing process where this is done under pressure
- other relevant equipment.

Tools and equipment

This competency includes use of equipment and tools such as:

- application equipment (eg brushes, syringes, pipettes, spray guns, application scrapers)
- additional equipment (eg vapour extraction, application booths)
- manual handling aids (eg hand carts, trolleys)
- hoists/lifting equipment not requiring any special permits or licences
- relevant personal protective equipment.

Hazards

Typical hazards include:

- spills and splashes
- toxic fumes or vapours
- hazardous materials
- manual handling hazards
- flammable vapours.

Problems

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

- incorrect selection of joining materials
- variations in materials
- contamination of joining materials or substrates
- inappropriate application of materials
- dust and other contamination
- drying rates
- film thickness variation
- film application rates
- coverage
- tack (too much, not enough, long leg/short leg)
- products with substrate or other faults.

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

Variables

Key variables to be monitored include:

- application patterns
- adhesive consistency
- substrate preparation, condition and finish
- adhesive viscosity
- solvent/thinner blend ratios.
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Unit Sector(s)

Not applicable.