



Australian Government

Department of Education, Employment and Workplace Relations

MEM26008A Select and use resin systems appropriate for product

Release: 1

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Modification History

Release 1 New unit

Unit Descriptor

This unit of competency covers the skills and knowledge required to select appropriate resins and resin systems for a job from what is normally used by organisation, as well as what is available commercially. It includes the chemistry of resins.

Application of the Unit

This unit may cover the redesign of an existing product (e.g. using a different process) or the design of a new product similar to an existing product.

This unit does not include the selection of a suitable reinforcing system. Where the reinforcing system also needs to be chosen refer to MEM26007A Select and use reinforcing appropriate for product.

Resin selection may typically be undertaken by an individual in liaison with relevant stakeholders or it may undertaken by a team. Selection may be undertaken in an office environment or at the worksite.

Use of the resin will be part of a fabrication and may be undertaken by an individual or a team. It may be undertaken in a workshop or factory environment or in the field and may be used to manufacture new products, prototypes and samples, or to make repairs.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Interpret product requirements	1.1	Determine requirements of final products
		1.2	Determine requirements of resin system
		1.3	Select appropriate process to be used to fabricate product
2	Select most appropriate resin/resin system for job	2.1	Determine performance outcomes required from resin
		2.2	Interpret specifications of available resins
		2.3	Compare required properties with specifications of available resin systems
		2.4	Interpret material safety data sheets (MSDS) for possible resin systems
		2.5	Select most appropriate resin
3	Evaluate selected resin system	3.1	Identify current conditions impacting on resin chemistry
		3.2	Identify adjustments which may be made to meet current conditions
		3.3	Make allowable adjustments and monitor result
		3.4	Fabricate a sample using the selected resin system and nominated reinforcing
		3.5	Conduct/organise for relevant tests
		3.6	Evaluate process evaluation test (PET) results
		3.7	Review match of PET results with product requirements

- 3.8 Review fabrication process
- 3.9 Make any required changes to resin system or process
- 4 Fabricate product
 - 4.1 Identify and control hazards
 - 4.2 Prepare nominated reinforcing, as required
 - 4.3 Lay reinforcing in correct direction, as appropriate
 - 4.4 Make any appropriate adjustments to the resin system recipe
 - 4.5 Mix selected resin system, as required
 - 4.6 Fabricate product using selected process
 - 4.7 Minimise waste
 - 4.8 Review product compared to requirements
 - 4.9 Review reinforcing selection and fabrication process
 - 4.10 Identify areas for improvement and take appropriate actions
 - 4.11 Complete any required documentation/reporting

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- interpreting quality control and quality assurance requirements
- interpreting specifications
- interpreting product/technical data sheets and MSDS

Required knowledge

Required knowledge includes:

- physical and chemical properties of resins
- resin types, cost and source
- catalyst types and systems (e.g. polyester and vinyl ester)
- hardener types (e.g. epoxy and phenolic)
- fillers and thickeners (e.g. mineral extenders, milled and cut fibre)
- catalyst hazards (e.g. self-accelerating decomposition temperature (SADTs))

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that the process and equipment be understood and that the importance of critical material properties, settings and readings is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • all reasonably available resin systems have been considered • an appropriate resin system has been chosen
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	- the reasons for choosing the resin system are sound - the product meets its required performance. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.
Context of and specific resources for assessment	Assessment will require the selection and use of appropriate resin and resin systems for specified composite jobs. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.
Method of assessment	A single assessment event is not appropriate. On-the-job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

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. Bold italicised wording, if used in the performance criteria, is detailed below. 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) may also be included.

Procedures	Procedures may be written, verbal, computer-based or in some other form, and may include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations
Requirements of final product	Requirements of final product may be determined from various sources, including: • drawings • product specifications • customer requests • descriptions of required use of product
Requirements of resin system	Requirements of resin system include: • strength • flexibility/rigidity • surface finish and colour • shrinkage • chemical/ultraviolet (UV)/environmental resistance • operating temperature and heat distortion temperature • recyclability
Resin specification	Resin specification is also known as material or technical data sheet
Most appropriate resin	Most appropriate resin refers to that resin system/resin system which has: • compliance with product requirements • greatest ease of use in manufacture • best financial return • greatest sustainability contribution
Sustainability	Sustainability incorporates the three aspects of: • survival of the ecology/physical environment – which means that an enterprise needs to manage the impact of the business to ensure the survival of the physical

	environment • economic viability – efficiency, cost and waste reduction and competitiveness to support survival of the business • social sustainability – an enterprise needs to manage the impact of the business to ensure its continued survival within the community and the survival of the community, including occupational health and safety (OHS)
Preparing reinforcing	Preparing reinforcing includes: • cutting to size/shape, as required • any pre-treatment required
Reinforcing direction	Reinforcing direction includes considerations, such as: • fibre orientation • fibre pre-forming
Resin system adjustments	Adjustments to the resin system chemistry may be as a result of: • temperature • humidity • required cure time Adjustments may only be made within the allowable limits of the system being used
Logs and reports	Logs and reports may include: • paper or electronic based • verbal reports • items found which require action
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person
Typical problems	Typical problems may include: • cost/benefit of different resin systems • selecting a resin system suited to the fabrication process

Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence
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Unit Sector(s)

Composites

Custom Content Section

Not applicable.