Australian Government

Assessment Requirements for MEM48032 Select composite materials for engineering and manufacturing applications

Release: 1

Assessment Requirements for MEM48032 Select composite materials for engineering and manufacturing applications

Modification History

Release 1. New unit.

Performance Evidence

There must be evidence the candidate has demonstrated the ability to:

- follow work instructions, standard operating procedures (SOPs) and safe work practices
- identify and interpret specifications, drawings, job sheets and other applicable reference documents in selecting composite materials for engineering applications
- research common composites and natural materials for engineering applications by their required properties for a specific application on at least two occasions
- select tests appropriate for the selected material
- arrange tests appropriate to the non-metallic material and analyse the results on at least two occasions
- verify selection of materials.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- bonding processes within and between composites including:
- adhesion and substrate/resin interactions and control mechanisms
- types of polymers and plastics used in composites including:
  - linear polymers: e.g., polyethylene, PVC, polystyrene
  - elastomers including natural rubber (polyisoprene), (acrylonitrile butadiene)
  - thermosetting polymers: e.g. phenol formaldehyde, epoxides
  - inorganic glasses: e.g., oxide glasses, silica, borosilicate
  - gels
- common features and difference between monomers and polymers
- thermoplastics and thermosets
- crystallinity and non-crystallinity features in polymers
- additives including filters, reinforcements, plasticizers, UV stabilisers, antioxidants, lubricants, colourings and flame retardants
- safe working practices to take into account when selecting composite materials with silica and quartz-based fillers
- common resins used in composite materials and their applications, including:

  - phenolic
  - polyester
  - alkyd
  - polycarbonate
  - polyurethane
  - polyamide
  - silicone
  - epoxy
  - polyethylene
  - polystyrene
  - polypropylene resins
  - vinyl ester
- failure modes of common composites and relationship to manufacturing errors, wear and incorrect usage or maintenance
- principles involved in selecting composite materials
- common engineering related properties of composites
- composite properties commonly requiring testing and testing methods.
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Assessment Conditions

- Assessors must:
  - have vocational competency in selecting composite materials for engineering and manufacturing applications at least to the level being assessed with relevant industry knowledge and experience
  - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015 or its replacement* and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring State as the case requires.
- Where possible, assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- There must be suitable access to an operating plant or equipment that allows for appropriate and realistic simulation and documentation including relevant workplace procedures, industry codes and standards.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2