



Australian Government

Assessment Requirements for MEM23131 Evaluate rapid prototyping applications

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM23131A Evaluate rapid prototyping applications.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- determining technologies, parameters and context of rapid prototyping applications
- evaluating suitability of a rapid prototyping application against alternative processes
- reviewing features and functions of rapid prototyping processes
- selecting appropriate rapid prototyping principles and techniques, analysis techniques and software on at least two occasions
- determining work health and safety (WHS) and regulatory requirements, and risk management and organisational procedures
- assessing software, facilities, plant, tooling and materials
- analysing labour and skills distribution requirements, degree of automation and competitiveness, costs and break-even
- evaluating rapid prototyping against alternative methods and technologies on at least two occasions
- reporting and documenting results of evaluation.

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

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- rapid prototyping applications
- range, features and applications of rapid prototyping processes including:
 - digitisers and reverse engineering processes
 - selective laser sintering (SLS)
 - fused deposition modelling (FDM)
 - stereolithography (SLA)
 - laminated object manufacturing (LOM)
 - electron beam melting (EBM)
 - 3D printing (3DP)
 - solid freeform fabrication

- sprayed metal deposition
- direct metal deposition (DMD)
- casting (patternless and rapid pattern processes)
- vacuum forming
- rapid machining (subtractive) options
- rapid cutting options, including computer driven gas and laser cutting
- robot and auto welding
- common applications for rapid prototyping including:
 - concept modelling
 - multiple design iterations at low cost
 - form, fit and function testing prior to committing to tooling
 - market design verification prior to mass production
 - masters for vacuum forming and investment casting
 - one piece thermoplastic jigs and fixtures
 - one-off full-strength plastic, cast, direct deposited metal or sprayed metal components
- sources of technical and professional assistance
- sustainability implications of rapid prototyping applications and processes
- rapid prototyping principles, techniques and software
- WHS, regulatory and risk management requirements relevant to rapid prototyping applications
- facilities, services, plant and tooling required for rapid prototyping applications
- materials used in additive ‘printing’ processes
- materials for sprayed metal deposition
- materials for rapid casting
- other materials including:
 - thermoplastics for vacuum forming
 - materials for rapid machining and fabrication
- component design processes and computer-aided design (CAD) techniques relevant to rapid prototyping processes and applications including:
 - size limitations
 - combining components
 - digitising
 - reverse engineering
- labour and skills requirements relevant to rapid prototyping
- systems thinking, continuous improvement, and constraint and contingency management techniques
- WHS and regulatory requirements, codes of practice, standards, risk management and registration requirements.
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Assessment Conditions

- Assessors must:
 - have vocational competency in evaluating rapid prototyping 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/territory 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.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- 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>