



**Australian Government**

**Assessment Requirements for MEM23114  
Evaluate thermodynamic systems and  
components**

**Release: 1**

# Assessment Requirements for MEM23114 Evaluate thermodynamic systems and components

## Modification History

Release 1. Supersedes and is equivalent to MEM23114A Evaluate thermodynamic systems and components

## 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 parameters and context of evaluation task
- determining work health and safety (WHS), regulatory requirements, risk management and organisational procedures
- identifying features, functions and components of thermodynamic dynamic systems and components
- investigating and reviewing sustainability implications, features and functions of thermodynamic systems and components on at least two occasions
- evaluating components and systems to determine safety, efficiency and fitness for purpose
- evaluating combustion, steam, air compression and refrigeration and air conditioning processes
- determining system performance and heat transfer on at least two occasions
- reporting and documenting processes and results of evaluation including calculations, component and system layouts, functional diagrams and thermodynamic cycle diagrams.

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

## Knowledge Evidence

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

- WHS and regulatory requirements, codes of practice, standards and risk management requirements
- thermodynamic systems and components
- availability of professional and technical assistance
- current options and trends in performance analysis software including underpinning program techniques and software validation techniques
- descriptions of thermodynamic devices and systems including boilers, turbines, refrigerators, gas-turbines and rockets
- concepts related to thermodynamics including:
  - properties, process and state

- mass, conservation of mass, specific volume and density, force, weight, pressure and temperature
- systems, cycles and steady state
- energy forms
- effects of heating of solids and liquids
- heat transfer, conduction, convection and radiation including related laws and calculations
- typical thermodynamic devices and engines, and thermal cycles
- closed and open systems including:
  - non-flow, internal energy
  - flow systems, mass and volumetric flow and continuity of flow
- steady flow and enthalpy, turbines, compressors, boilers and heat exchanger applications
- zeroth and first laws in detail and second law (conceptual)
- gas laws and characteristics
- gas compression effects, measurements and calculations
- compressor types and characteristics of heat engines, including types, cycles, performance and efficiency fuels and combustion steam plant and processes for steam generation, heat transfer and power production, including steam saturation steam tables
- air conditioning, refrigeration and heat pumping plant and processes
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## Assessment Conditions

- Assessors must:
  - have vocational competency in evaluating thermodynamic systems and components 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>