



**Australian Government**

# **MEM23114 Evaluate thermodynamic systems and components**

**Release: 1**

# MEM23114 Evaluate thermodynamic systems and components

## Modification History

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

## Application

This unit of competency defines the skills and knowledge required to evaluate thermodynamic systems and components including heat exchangers, heat engines, refrigeration, air conditioners and air compressors.

The evaluation can be undertaken as part of a design or system selection process or to assess system condition, sustainability or efficiency. It is suitable for people working as technicians or system designers and draftspersons, and for those pursuing careers and qualifications in engineering or related disciplines.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

## Pre-requisite Unit

MEM23004 Apply technical mathematics

MEM23006 Apply fluid and thermodynamics principles in engineering

## Competency Field

Engineering science

## Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Determine scope of thermodynamic system	1.1 Determine thermodynamic system and system components to be evaluated 1.2 Determine stakeholders to be consulted on the evaluation 1.3 Confirm that appropriate support, including technical and professional assistance, is available 1.4 Determine work health and safety (WHS) and regulatory requirements, risk management and organisational procedures 1.5 Investigate sustainability implications of thermodynamic

<b>Elements</b>	<b>Performance Criteria</b>
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	applications
2. Identify principles and techniques required for evaluation of thermodynamic system and components	2.1 Review features and functions of thermodynamic system and components 2.2 Determine thermodynamic principles and techniques required to evaluate system and select and optimise components 2.3 Determine appropriate analysis techniques, software and software validation techniques
3. Evaluate thermodynamic applications and components	3.1 Assess the performance of heat transfer devices 3.2 Assess heat engine performance 3.3 Assess combustion processes 3.4 Assess steam processes 3.5 Assess refrigeration and air conditioning processes 3.6 Assess air compression processes
4. Report results	4.1 Record outcomes of evaluation 4.2 Provide documentation including calculations, component and system layouts, and functional and thermodynamic cycle diagrams

## Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

## Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Sustainability includes:

- meeting all regulatory requirements
- conforming to all industry covenants, protocols and best practice guides

	<ul style="list-style-type: none"> <li>• minimising ecological and environmental footprint of process, plant and product</li> <li>• maximising economic benefit of process plant and product to the organisation and the community</li> <li>• minimising the negative WHS impact on employees, community and customer.</li> </ul>
Appropriate licensed technical and professional assistance includes:	<ul style="list-style-type: none"> <li>• technical support and advice relating to elements which have intrinsic dangers</li> <li>• professional support for technologies.</li> </ul>
WHS, regulatory requirements and organisational procedures include:	<ul style="list-style-type: none"> <li>• WHS acts, regulations and relevant standards</li> <li>• codes of practice from Australian and overseas engineering and technical associations and societies</li> <li>• risk assessments</li> <li>• safe work practices</li> <li>• state and territory regulatory requirements applying to electrical work.</li> </ul>

## Unit Mapping Information

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

## Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>