



Australian Government

**Assessment Requirements for MARL011
Apply basic principles of marine
engineering thermodynamics**

Release: 1

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Modification History

Release 1. New unit of competency.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least one occasion and include:

- applying relevant work health and safety/occupational health and safety (WHS/OHS) requirements and work practices
- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- identifying and applying relevant mathematical formulas and techniques to solve basic problems related to marine engineering thermodynamics
- identifying and interpreting numerical and graphical information, and perform basic mathematical calculations related to marine engineering thermodynamics, such as gas expansion and contraction, heat transfer, thermal efficiency, and the expansion of liquids and solids
- identifying, collating and processing information required to perform basic calculations related to marine engineering thermodynamics
- reading and interpreting written information needed to perform basic calculations related to marine engineering thermodynamics
- performing accurate and reliable mathematical calculations using a calculator
- solving problems using appropriate laws and principles.

Knowledge Evidence

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

- basic principles of marine engineering thermodynamics
- enthalpy
- effective verbal, written and visual communication strategies
- expansion processes for metals (conduction, convection, radiation)
- forms of heat transfer (conduction, convection, radiation)
- gas laws
- internal combustion engine cycles
- methods of heat transfer
- operating cycle of reciprocating air compressors
- operating principles of two stroke and four stroke internal combustion engines
- principles of refrigeration
- properties of fluids (density, mass, pressure, specific volume, temperature)
- SI units
- steam plants
- thermodynamic principles
- thermal efficiency calculations
- WHS/OHS requirements and work practices.

Assessment Conditions

Assessors must satisfy National Vocational Education and Training Regulator (NVR)/Australian Quality Training Framework (AQTF) assessor requirements.

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least one occasion and include:

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.

Assessment must occur in workplace operational situations or where this is not available, in simulated workplace operational situations or an industry-approved marine operations site that replicate workplace conditions where basic principles of marine engineering thermodynamics can be applied.

Resources for assessment include access to:

- diagrams, specifications and other information required for performing basic calculations related to marine engineering thermodynamics
- regulations, codes of practice and operation manuals
- relevant and appropriate tools, equipment and personal protective equipment currently used in industry
- relevant documentation including workplace procedures,
- technical reference library with current publications on basic marine thermodynamics.

Performance should be demonstrated consistently over time and in a suitable range of contexts.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>