



**Australian Government**

# **UEECD0037 Provide engineering solutions for uses of materials and thermodynamic effects**

**Release: 1**

# UEECD0037 Provide engineering solutions for uses of materials and thermodynamic effects

## Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

## Application

This unit involves the skills and knowledge required to provide engineering solutions for uses of materials and thermodynamic effects.

It includes selecting and using appropriate materials and dealing with thermodynamic effects relative to an engineering problem. It also includes using measuring instruments, applying appropriate theorems, and providing solutions derived from measurements and calculations and justification for engineering solutions.

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

## Pre-requisite Unit

Not applicable

## Competency Field

Cross Discipline

## Unit Sector

Electrotechnology

## Elements and Performance Criteria

### ELEMENTS

Elements describe the essential outcomes.

#### **1 Select materials, tools and equipment to deal with thermodynamic effects**

### PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

#### **1.1 Work health and safety (WHS)/occupational health and safety (OHS) processes and workplace procedures for a given work area are identified, obtained and applied**

- |          |            |                                                                                                                                                                             |
|----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | <b>1.2</b> | WHS/OHS risk control work preparation measures and workplace procedures are followed                                                                                        |
|          | <b>1.3</b> | Scope of engineering problems are identified from workplace documentation and/or work supervisor                                                                            |
|          | <b>1.4</b> | Advice is sought from the work supervisor to ensure the engineering work is coordinated with others                                                                         |
|          | <b>1.5</b> | Equipment, material and products required for engineering work are obtained in accordance with workplace procedures                                                         |
|          | <b>1.6</b> | Tools and testing devices required for work are obtained and checked for correct operation and safety                                                                       |
| <b>2</b> |            | <b>Provide engineering solutions to deal with thermodynamic effects</b>                                                                                                     |
|          | <b>2.1</b> | WHS/OHS risk control work measures and workplace procedures are followed                                                                                                    |
|          | <b>2.2</b> | The need to inspect and test active systems is determined in accordance with WHS/OHS requirements and workplace procedures                                                  |
|          | <b>2.3</b> | Systems are checked and isolated, as required, in accordance with WHS/OHS requirements and workplace procedures                                                             |
|          | <b>2.4</b> | Methods used to solve system problems are used from measured and calculated values as they apply to materials and thermodynamics                                            |
|          | <b>2.5</b> | Unplanned situations are dealt with in accordance with WHS/OHS requirements and approval of relevant person/s                                                               |
|          | <b>2.6</b> | Engineering problems are solved without damage to apparatus, circuits, the surrounding environment and/or services using sustainable energy practices with minimum of waste |
| <b>3</b> |            | <b>Complete work and document engineering solution/s</b>                                                                                                                    |
|          | <b>3.1</b> | WHS/OHS work completion risk control measures and workplace procedures are followed                                                                                         |
|          | <b>3.2</b> | Worksite is cleaned and made safe in accordance with workplace procedures                                                                                                   |
|          | <b>3.3</b> | Justification for solutions used to solve system problems                                                                                                                   |

is documented

- 3.4** Work completion is documented and relevant person/s notified in accordance with workplace procedures

## Foundation Skills

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

## Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

## Unit Mapping Information

This unit replaces and is equivalent to UEENEEE160A Provide engineering solutions for uses of materials and thermodynamic effects.

## Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

# **Assessment Requirements for UEECD0037 Provide engineering solutions for uses of materials and thermodynamic effects**

## **Modification History**

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

## **Performance Evidence**

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

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including
  - using risk control measures
- completing work and documenting solutions
- completing written justification of solutions
- coordinating work with others
- dealing with unplanned events in accordance with problem-solving techniques and workplace procedures
- inspecting and testing active systems
- obtaining and following work instructions
- obtaining and using tools, equipment and products
- preparing to provide solutions for the uses of materials and thermodynamics
- providing effective solutions to system problems from measurements and calculations
- providing solutions for the uses of materials and thermodynamics
- using sustainable energy practices in accordance with workplace procedures.

## **Knowledge Evidence**

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

- problem-solving techniques
- relevant apparatus, circuits, environment and services
- relevant inspection and testing methods
- relevant manufacturer specifications and operating instructions
- relevant material science and thermodynamics
- relevant measured and calculated values
- relevant job safety assessments or risk mitigation processes
- relevant sustainable energy principles

- relevant tools, equipment, material, products and testing devices
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace instructions, policies and procedures.

## Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated suitable workplace operational situations that replicate workplace conditions.

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.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or simulations
- relevant and appropriate materials, facilities, tools and equipment currently used in industry
- resources that reflect current industry practices in relation to providing solutions for uses of materials and thermodynamic effects
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

## Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>