



Australian Government

UEENEEG150A Wind electrical coils

Release: 2

UEENEEG150A Wind electrical coils

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers setting up coil former and winding machines and winding coils for static and rotating electrical machines. It encompasses working safely, using hand and powered tools, measuring, applying basic knowledge of electrical circuits, following technical instructions and set procedures and recording work activities.

Application of the Unit

Application of the Unit 2)

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) 4)

Competencies 4.1)

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEE1 01A Apply Occupational Health and Safety regulations, codes and practices in the workplace

UEENEEE1 02A Fabricate, assemble and dismantle utilities industry components

UEENEEE1 07A Use drawings, diagrams, schedules, standards, codes and specifications

Literacy and numeracy skills 4.2)

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills 5)

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

- 6) Elements describe the essential outcomes of a competency standard unit. Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to wind coils.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 Established OHS risk control measures for work preparation are followed.
	1.3 Work instructions are identified, obtained and understood.
	1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5 Materials required for the work are obtained in accordance with established routines and procedures.
	1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Wind coils.	2.1 Established OHS risk control work measures are followed.
	2.2 Winding machines are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.3 Winding wire and insulation is selected in accordance with work instructions and established routines.
	2.4 Winding formers and machine is set-up in accordance with routine instructions.
	2.5 Prescribed solutions are used to resolve work

ELEMENT	PERFORMANCE CRITERIA
	completion issues.
	2.6 Routine quality checks are conducted to ensure coils are correctly wound with correct wire, number of turns and shape.
	2.7 Work is completed in acceptable timeframe given environment and workplace conditions.
3 Complete work report.	3.1 OHS measures work completion risk control are followed.
	3.2 Work report forms/data sheets are completed accurately.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and winding coils.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies

KS01-EG150A

Coil winding and coil testing

Evidence shall show an understanding of coil winding and coil testing to an extent indicated by the following aspects:

T1 Coil data to be collected:

- Type of wire.
- Gauge.
- Number of turns.
- Type of coil.
- Type of insulation.
- Coil shape.

T2 Coil former types and construction/set up

- Coil shapes
- Factors which govern coil shape:
 - end room;
 - coil flexibility;
 - bore size of stator iron core;
 - depth of iron below the slots, in the iron core;
 - pressure points between the coils
- Types coil winding formers

T3 Coil winding machines

- Identify machine types:
 - foot pedal,
 - variable speed,
 - winding head fitted with a chuck;
 - Remote foot switch on a flexible lead, variable speed fitted with a face plate;
 - layer winding machine;
 - computer operated
- Operational safety precautions

T4 Coil insulations.

- Purpose

REQUIRED SKILLS AND KNOWLEDGE

- Temperature ratings
- Common insulating materials
- Polyester film backed elephantide; Nomex;
- Mylar;
- Nomex/mylar/nomex; Dacron/mylar/dacron;
- cloth, tape, and adhesive tape (glass); polyester glass laminate;
- sheet, tape, and adhesive tape (polyester film);
- Bakelite paper laminates

T5 Rewind small and medium size solenoid coils

- Strip and record data
- Prepare/insulate coil formers
- Wind each type of coil
- Finishing off process
- Test procedures

T6 Types of testing devices

- Multimeter;
- Series light;
- Insulation resistance tester;
- Wheatstone bridge

T7 Purpose of testing devices

- Multimeter;
- Series lamp;
- Insulation resistance tester;
- Wheatstone bridge

T8 Types of tests

- Continuity
- Short circuited turns
- Insulation resistance

T9 Testing techniques to identify faulty coils

- Physical inspection.
- Using a testing device.

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment 9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit 9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
 - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
 - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
 - Demonstrate an appropriate level of skills enabling employment
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
 - Winding coils as described as described in 8) and including:
 - A Following winding specifications.
 - B Selecting correct winding wire and insulation.
 - C Setting up and operating winding machine.
 - D Adhering to quality procedures.
 - E Completing work report/forms accurately.

F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

**Context of and
specific
resources for
assessment** 9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to winding coils.

**Method of
assessment** 9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary

equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

**Concurrent
assessment and
relationship with
other units** 9.5)

There are no concurrent assessment recommendations for this unit.

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to winding at least four different types of coils in an environment designed specifically for the purpose.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field 11)
Electrical