

1. Module details

Module name

Safety Checking Electrical Appliances

Suggested structured learning time

A learner possessing the prerequisite skills and knowledge should achieve the module purpose in 10 hours.

Module code

NUE019

Discipline code

031313

2. Module purpose

The module provides the knowledge and skills to enable learner to undertake inspection, testing and tagging procedures using portable appliance testers (PATs) to check the serviceability of single-phase, low voltage, portable electrical equipment in accordance with the requirements of AS/NZS 3760, In-service safety inspection and testing of electrical equipment. Note: The module neither cover the inspection and testing of three-phase 400 volt electrical equipment or RCDs.

3. Learning pathway

Intended use in the structured learning program

This module is intended to provide the knowledge and skills as a stand-alone module for people seeking to demonstrate competence in the area of inspection, testing and tagging of single phase, low voltage, portable electrical equipment using portable appliance testers (PATs).

Therefore before undertaking this module a learner should have a clear understanding of the range of work limitations that this module apply.

Recommended prerequisites

Entry into this module will be limited to those learners employed or intending to be employed to carry out inspection and testing procedures.

4. Relationship to competency standards

This module provides part of the underpinning knowledge and skills in the 'Evidence Guide' of specific units of competency in the National Electrotechnology Training Package and provides similar support, where mapped, to equivalent units in the National Metals and Engineering Competency Standards. For details refer to the module to unit maps, EE-Oz Training Standards (formerly EEQSBA).

5. Content

1. Australian Standards and Commonwealth/State/Territory Legislation and Regulations
 - Australian Standard AS/NZS 3760
 - Commonwealth/State/Territory Occupational Health and Safety Acts and Regulations
 - Limitations of work that can be undertaken
 - Codes of Practice and associated guidance material
 - Risk management principles
2. Basic Electrical Testing Concepts
 - Basic electrical circuits

	<ul style="list-style-type: none">• Functions of electrical circuit• Conductors and insulators• Basic electrical supply system• Relationship of electrical quantities• Effects of electrical currents• Methods/devices used to negate or minimise electrical shock <p>3. Electrical equipment testing</p> <ul style="list-style-type: none">• Classification of electrical equipment• Inspection of electrical equipment (visual inspections)• Earth continuity testing• Insulation resistance testing• Polarity testing (extension cords and IEC cords)• PAT maintenance and calibration <p>4. Testing and tagging documentation requirements</p> <ul style="list-style-type: none">• Risk assessment documentation• frequency of inspection and testing• tagging of equipment• records maintenance
6. Assessment strategy	
Assessment methods	<p>Assessment should be progressive reflecting a holistic approach to ensure the module purpose is met. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests consisting of a number of item types, such as multiple choice, short answer and problem solving.</p>
Conditions of assessment	<p>Normally learning and assessment will take place in a formal learning environment.</p>
7. Learning outcome details	On completion of this module the learner will be able to:
Learning outcome 1	<p>Apply the relevant Commonwealth/State/Territory Legislation and regulation and Australian Standards requirements for testing and tagging single-phase low voltage portable electrical equipment.</p>
Assessment criteria	<p>1.1 Interpret and apply the AS/NZS 3760 requirements for inspection and testing single-phase low voltage portable electrical equipment.</p> <p>1.2 Interpret the Commonwealth/State/Territory Occupational Health and Safety Acts and Regulations, which apply to electricity.</p> <p>1.3 List the limitations of the inspection and testing electrical appliances covered in the scope of this training program.</p>

Learning outcome 2

- 1.4 Interpret Commonwealth/State/Territory documentation available in relation to inspection and testing electrical equipment.
- 1.5 Apply risk management principles and procedures in determining the frequency and identifying the equipment to be inspected/tested.

Explain basic electrical concepts associated with the inspection and testing of single-phase low voltage portable electrical equipment.

Assessment criteria

- 2.1 Identify sources of low voltage a.c. electrical supply, control switches, protection devices and consuming devices.
- 2.2 State the function of sources of electrical supply, control switches, protection devices and consuming devices.
- 2.3 State the relationship of voltage, current and resistance.
- 2.4 Describe the function of conductors and insulators (basic insulation, supplementary insulation, double insulation and reinforced insulation).
- 2.5 Describe the basic configuration of a single-phase and three-phase low voltage supply system.
- 2.6 State the effect of electrical current passing through a human body.
- 2.7 List the four methods used to minimise electric shock.

Learning outcome 3

Carry out inspection and testing single-phase low voltage portable electrical equipment for safety.

Assessment criteria

- 3.1 List and describe the various types of electrical equipment (Class 1 equipment, Class II equipment, cord set, electric portable outlet device, fixed equipment, isolating transformer, portable equipment, power pack, residual current device, stationary equipment and supply flexible cord).
- 3.2 Carry out visual inspection of single-phase low voltage portable electrical equipment for serviceability.
- 3.3 Carry out earth continuity tests using a portable appliance tester (PAT) on a range of single-phase low voltage portable electrical equipment.
- 3.4 Carry out insulation tests using a portable appliance tester (PAT) on a range of single-phase low voltage portable electrical equipment.
- 3.5 Carry out polarity tests using a portable appliance tester (PAT) on a range of single-phase low voltage extension cords and IEC (appliance) cords.

Learning outcome 4	3.6 State the requirements for the maintenance and re-calibration of Portable Appliance Testers (PATs). Demonstrate knowledge and skills of recording and maintaining documentation of the inspection and testing of single-phase low voltage portable electrical appliances.
Assessment criteria	4.1 State the procedures for carrying out a risk assessment and the relevant documentation when undertaking inspection and testing of single-phase low voltage portable electrical appliances 4.2 State the recommendation using the current Australian Standard AS/NZS 3760 for the frequency of inspection and testing of single-phase low voltage portable electrical equipment. 4.3 State the recommended methods of tagging electrical equipment to identify compliance of the electrical equipment. 4.4 State the recommended methods of the maintenance of inspection and testing records of single-phase low voltage portable electrical equipment.
8. Delivery of the module	
Delivery strategy	Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective method to achieve this is by integration of theory and practice where learners learn by experimentation, research and reports. It is recommended that learning and assessment be facilitated in a holistic manner that may require a learning outcome sequence other than that indicated in the module.
Resource requirements	Resources should be sufficient for learners to carry out exercises on an individual basis. Trainers/teachers/facilitators must have qualifications in the relevant subject area for the AQF level program being delivered and, they are engaged to deliver recognised trainer and assessment training and at least three to five years relevant work experience. Useful references include: <ul style="list-style-type: none">• Class notes, workbook, calculator• <i>Standards Australia</i>, Relevant standards Where this module is used in an approved Traineeship or Apprenticeship program learners should be advised to obtain, where available, respective EE-Oz Training Standards ¹ <i>User</i>

¹ EE-Oz Training Standards – ElectroComms and EnergyUtilities Industry Skills Council Ltd formerly ElectroComms and EnergyUtilities Qualifications Standards Body of Australia Ltd (EEQSBA)

***Guides** (these outline in detail what training and work performance the Learner is required to undertake for the program).*

Standards Australia, Standards New Zealand:

AS/NZS 3760 – In-service safety inspection and testing of electrical equipment

Commonwealth/State/Territory Legislation and OHS Acts, Regulations, codes of practice and associated guidance material

Occupational health and safety requirements

A safe and healthy environment will be provided for learners and teachers. Safety policies and procedures for the particular learning facilities shall be followed as part of the learning / teaching activity and assessment.

Assessment Strategy

A recommended assessment strategy is appended to this descriptor (Appendix A)

Appendix A - Assessment Events – NUE019

Number	Name	Event Timing Weighting		Must Pass
1	Theory Test	9/10	0%	Yes
2	Practical Test	10/10	0%	Yes

Assessment Events' Comments:

Event 1:

Event Type : Theory Test
Timing : After topic 4
Types of Items : Multiple choice, short answer questions
Coverage : Topics 1 to 4
Duration : 1 hour
Conditions : This test should take place in a standard theory room. The current Australian Standard AS/NZS 3760 can be used. To pass, there are certain questions within this test that must be answered without error.

Event 2:

Event Type : Practical Test
Timing : After topic 4
Types of Items : Inspection and testing a selection of single-phase, low voltage, portable electrical equipment/tools/appliances
Coverage : Topic 3
Duration : 1 hour
Conditions : This test should take place in a standard electrical laboratory room.
The test components should consist as a minimum, at least 6 items of single phase, low voltage, portable electrical equipment items (at least 2 items of Class 1 equipment, 2 items of Class 2 equipment, 1 extension lead or IEC lead, and 1 power pack or, plug pack power supply unit, or portable isolation transformer).
For the items used in this test, at least 50% should have faults such as damaged leads, high earth resistance, low insulation resistance, incorrect polarity.
The tests carried out should be as per the current Australian Standard AS/NZS 3760, which must include a visual inspection, earth continuity, insulation resistance test and/or polarity test.

All equipment test results should be documented by the individual student and only one attempt at each test should be allowed.

Students would be required to correctly identify all electrical appliances as either being faulty or safe on the first attempt.

The practical test must be undertaken on an individual basis by the student.

The assessment for this module should take place at least one (1) week after the learning and practice has being undertaken. This is to ensure that the critical aspects of evidence are recalled outside the short term memory domain.