# Electrical Equipment – Inspection, Testing and Tagging Procedure

## UNDER REVIEW

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|---|---|
| **Related Policy** | Work Health and Safety Policy |
| **Responsible Officer** | Executive Director – Human Resources |
| **Approved by** | Executive Director – Human Resources |
| **Approved and commenced** | November, 2013 |
| **Review by** | November, 2016 |
| **Responsible Organisational Unit** | Work Health and Safety |

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## 1 Objective

Faulty electrical appliances can cause electrical shocks, electrocutions and electrical fires.

Electrical risks must be eliminated as far as reasonably practicable and if elimination is not practicable, the risks must be minimised so far as reasonably practicable.

Inspection, testing and tagging is a reasonably practicable method of minimising electrical risk and is a requirement under the Work Health and Safety (WHS) Regulations.

This procedure is to provide practical guidance to Organisational Units for the proactive management of electrical safety in the workplace through the inspection, testing and tagging of electrical equipment in accordance with:

- Work Health and Safety (WHS) Regulation 2012;
- Code of Practice – Managing Electrical Risks in the Workplace

## 2 Scope

This procedure applies to all electrical equipment used on the Australian campuses of the University of Tasmania (University) and within University controlled entities. It covers University sanctioned activities by staff and students of the University, contractors, visitors, hire companies or any other person or agency associated with approved University activities.

This procedure:

- is not intended to cover technical and complex electrical safety issues
- does not cover specified industries e.g. construction work
- does not cover electrical risks arising from overhead or underground electrical lines

### 2.1 Medical devices and electrical devices in patient care areas

This procedure does not include medical devices and electrical devices in patient care areas which are specifically excluded from the scope of Australian Standard AS/NZS 3760:2010.
Medical equipment is to be tested as per AS 3551.2004, AS3200.1 and AS2500:2004 and this work must be undertaken by a medical equipment specialist

## 3 Procedure

### 3.1 Legislative requirements

In accordance with the following WHS Regulations, the University must:

***149. Unsafe electrical equipment***

Ensure that any unsafe electrical equipment at the workplace is disconnected (or isolated) from its electricity supply; and once disconnected (or isolated) is not reconnected until it is repaired or tested and found to be safe; or is replaced or permanently removed from use.

Electrical equipment is unsafe if there are reasonable grounds for believing it to be unsafe.

***150. Inspection and testing of electrical equipment***

Ensure that electrical equipment is regularly inspected and tested by a competent person if:

- the electrical equipment is supplied with electricity through an electrical socket outlet and
- used in an environment in which the normal use of electrical equipment exposes the equipment to operating conditions that are likely to result in damage to the equipment or a reduction in its expected life span, including conditions that involve exposure to moisture, heat, vibration, mechanical damage, corrosive chemicals or dust.

Electrical equipment that is new and unused at the workplace is not required to be tested. However, the University must ensure that the equipment is inspected for obvious damage before being used.

A record of any testing carried out must be kept until the electrical equipment is next tested, or permanently removed from the workplace, or disposed of.

The record of testing must specify the name of the person who carried out the testing; the date of the testing; the outcome of the testing; the date on which the next testing must be carried out; and may be in the form of a tag attached to the electrical equipment tested.

***151. Untested electrical equipment not to be used***

Ensure, so far as is reasonably practicable, that electrical equipment is not used if the equipment is required to be tested and has not been tested.

***Code of Practice***

The Code of Practice - *Managing Electrical Risks in the Workplace* provides a practical guide to achieving the standards of health, safety and welfare required under these Work Health and Safety (WHS) Regulations.

## 3.2 Inspection and Testing

A regular program of inspection, testing and tagging comprises:

- a visual check to ensure there are no obvious problems
- a series of electrical tests to ensure the safety of the item
- tagging of the equipment to indicate to users that the item has been identified as safe in accordance with AS/NZS 3760:2010 and when the item is due to be tested again
- provision of a detailed Asset Register and Log Book.

## 3.3 Risk Assessment

The electrical equipment to be tested and the frequency of testing are determined by a risk assessment which relates directly to:

- the environment in which the equipment is operated
- the use to which the equipment is put.

The Organisational Unit is responsible for determining the electrical equipment to be inspected, tested and tagged, the frequency of testing and for keeping testing records.

The testing schedule may vary between Organisational Units due to the assessed risks or for operational reasons.

Each Organisational Unit is required to assess electrical risks at the workplace. It is not the duty of an engaged contractor to undertake the risk assessment.

The Organisational Unit is to have a signed, documented risk assessment on file, to be made available on request to the Work Health and Safety Unit or Workplace Standards Inspector or delegate.

## 3.4 Risk Control

Prior to inspection and testing being undertaken, the hierarchy of risk control is to be applied as follows:

- Elimination – for example, dispose of equipment no longer used, or change the teaching or research practices so that this equipment is no longer required
- Substitution – for example, replace corded electrical equipment with cordless equipment to mitigate the risk during operation
- Engineering control – for example, install Residual Current Devices (RCDs) to reduce the risk of electrical shock.

## 3.5 Who can inspect, test and tag appliances and equipment

### Inspect

Regular visual inspection can identify obvious damage, wear or other conditions that might make electrical equipment unsafe. Many electrical defects are detectable by visual inspection.

A worker (if competent to do so) is to undertake a check of the physical condition of the electrical equipment, including the lead and plug connections, prior to commencing use.

### Inspect, test and tag

Inspection and testing of electrical equipment must be carried out by a competent person who has the relevant knowledge, skills and test instruments to carry out the relevant inspection and testing. The person carrying out any testing of electrical equipment should also be competent to interpret the test results of any equipment they use. For example, a person carrying out testing under AS/NZS 3760:2010 must be:

- a licensed or registered electrician (whichever applies) or
- in some jurisdictions, a licensed electrical inspector or
- a person who has successfully completed a structured training course and been deemed competent in the use of a pass-fail type portable appliance tester and the visual inspection of electrical equipment.

### Repair faulty electrical equipment

Only a qualified person may repair faulty electrical equipment. A qualified person shall be either:

- a licensed electrician approved to work on the electrical installation and electrical appliances
- an electronics technician approved to work on electrical appliances connected to or capable of being connected to the electrical installation

- a tradesperson holding a restricted electrical licence (air conditioning mechanic, plumber, mechanical fitter, electrical fitter) approved to work on restricted electrical appliances and their connection to the electrical installation according to the specific conditions of their licence
- such other person approved to work on electrical appliances by way of demonstration that their knowledge and experience is sufficient for them to do so safely
- such other person approved to undertake service repair of electrical appliances.

Models that can be used to carry out testing and tagging of electrical equipment include:

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| **Training a staff member** | Manager to appoint an appropriate staff member to be trained in the competency unit.<br>Approved training is provided by TAS TAFE, Skills Institute, Tasmanian Academy and other external providers.<br>The Organisational Unit may purchase or hire testing equipment.<br>Approved testing equipment is available from electrical suppliers. Some equipment will print a record, or a record can be downloaded to an electronic file. |
| **Campus Services** | The Organisational Unit raises a Work Request to organise Campus Services to inspect, test and tag the equipment or contact the Service Desk on 2791 or email campus.servies@utas.edu.au. |
| **Contractor** | The Organisational Unit independently contracts a company to inspect, test and tag the equipment. |

## 3.6 Electrical Appliances requiring testing: See reference Appendix 1

**Low risk – No** (subject to the outcome of a risk assessment)

Not all electrical items need to be inspected and tested under Regulation 150. Electrical equipment used in lower-risk operating environments (subject to the outcome of a risk assessment) may not require inspection and testing or 'tagging'.

Lower-risk workplaces include those workplaces that are dry, clean, well-organised and free of conditions that are likely to result in damage to electrical equipment, for example an office, classroom, computing laboratory, ITS office areas, learning hubs, etc.

Electrical equipment commonly used in these types of lower-risk workplaces includes computers, photocopiers, stationery or fixed electrical equipment. A key source of information on dealing with the inspection and testing of electrical equipment is the manufacturer's recommendations.

**Moderate or High Risk – Yes**

Electrical testing is required where a risk assessment identifies a hostile environment where the electrical equipment or flexible supply cord, portable RCD, is, in its normal use, subject to operating conditions that are likely to result in damage to the equipment**.**

This includes an operating environment that may cause mechanical damage to the item of equipment, or expose the item of equipment to moisture, heat, vibration, corrosive substances or dust.

Examples include:

- wet or dusty areas including ceramic metal or wood working areas, outdoors, workplaces that use corrosive substances, commercial kitchens, and farms
- laboratory/studio/workshop, design studios areas with use of electrical equipment by undergraduate and/or postgraduate students
- electrical equipment in use in student residential accommodation
- electrical equipment used in wet areas such as kitchens, tea making facilities within an office or meeting room environment with a sink (wet area) etc.
- laboratory/studio/workshop areas teaching facilities, lecture theatres, etc. with use of electrical equipment not managed centrally by the University
- computer laboratories; multi-use areas such as libraries, sporting facilities, etc.
- computer laboratories; multi-use areas such as libraries where the equipment is kept over 5 years.

**Stationary and fixed equipment – No** (subject to the outcome of a risk assessment)

Stationary and fixed equipment connected by a fixed cable or flexible lead which is not flexed in normal use, exposed to damage or in a high-risk operating environment does not require testing – subject to the outcome of a risk assessment**.**

- Fixed equipment is fastened to a support, secured in position due to size and mass
- Stationary equipment is any equipment with a mass exceeding 18kg and not provided with carry handles.

## 3.7 Frequency of inspection and testing

The testing intervals listed in Table 1 are taken from the Australian Standard 3760 Table 4 which is to be used as a guide and covers most circumstances.

Any repaired, serviced or secondhand equipment must be tested after repair or before reintroduction to service.

Any equipment/appliances in storage must either have an in date tag or be tagged with an ‘out of service tag’ and must be tested and tagged prior to use.

For further guidance see: Appendix 2: A guide to typical test and tag frequencies for common appliances.

## 3.8 New Equipment

New electrical equipment that has never been put into use does not have to be tested before first use, as the supplier is deemed responsible for the initial electrical safety of the new item.

However the Manager/Supervisor must ensure that new equipment is inspected for obvious damage before being used and that it is added to a Register upon entering service and is tested during the next scheduled test for their work area. In addition:

- Secondhand equipment must be tested

- When new equipment is installed, particularly computers, ensure that the electrical cords are exchanged and the new cords are visually inspected
- The date the electrical equipment was placed into service should be recorded (e.g. on the record of installation or elsewhere).

The electrical equipment may also be fitted with a tag stating:

- that the equipment is 'new to service'
- the date of entry into service
- the date when the first electrical safety test is due
- that the equipment has not been tested.

Fitting a 'new to service' tag is an administrative task that can be carried out by an appropriately trained person.

**Equipment not in use**

Only equipment in use needs to be tested - consider eliminating equipment that is not in use.

Equipment not in use and/or out of testing date is to have an Out of Service tag attached indicating that the equipment must be tested prior to use.

Out of Service tags are available from the WHS Unit.

## 3.9 Appliances and equipment brought in from home or by contractor

Electrical equipment and appliances brought for use on a UTAS site by contractors, students, volunteers or other persons is subject to the same inspection and testing procedure as the equipment owned or leased by the University.

Electrical equipment and appliances must be inspected and tested prior to their use on University premises.

There is no requirement to test and tag personal laptops. However laptop cords should always be inspected prior to use. It is recommended that personal laptops older than 3 years be tested and tagged.

Testing is the responsibility and at the expense of the owner unless the Organisational Unit agrees to fund the cost.

## 3.10 Results of inspection and testing

The authorised person undertaking testing is to comply with the following:

***Non-compliant equipment***

- Tag out using special tag indicating the equipment is non-compliant or unsafe etc. and advise the relevant Organisational Unit and/or
- Remove the non-compliant item service or otherwise ensure it is not used.

The Organisational Unit must organise to repair or dispose/destroy the non-compliant equipment and adjust the inventory as applicable.

***Compliant equipment***

- Attach a durable, non-reusable, non-metallic tag colour coded for the year. Further details can be found in the Standard (AS/NZS 3760-2010);
- Tags can be purchased from most printing companies

***Inspecting and testing portable RCDs***

- Requirements for residual current devices (RCDs) apply to workplaces where "plug in" electrical equipment (electrical equipment supplied with electricity through a socket outlet) is used in the following operating environment:
  - electrical equipment is exposed to operating conditions that are likely to result in damage to the equipment (or a reduction in its expected life span) including conditions that involve exposure to moisture, heat, vibration, mechanical damage, corrosive chemicals or dust
  - electrical equipment is moved between different locations in circumstances where damage to the equipment or to a flexible electricity supply cord is reasonably likely
  - electrical equipment is frequently moved during its normal use
  - electrical equipment forms part of, or is used with, an amusement device.
- If electricity is supplied through a socket outlet that does not exceed 20 amps, then the RCD must have a tripping current that does not exceed 30 milliamps.

The Manager/Supervisors may need to seek technical advice from a competent person about the kinds of RCDs that are appropriate for the workplace.

## 3.11 RCD Protection

RCD protection is required for the following electrical equipment and depending on the type of appliance, installation and environment, the RCD protection may be provided by either portable or fixed RCDs.

- Hand held electrical equipment, including power tools, hair dryers and electrical knives
- Electrical equipment which is moved during operation, including vacuum cleaners, floor polishers, extension cords, power boards, portable lighting
- Electrical equipment which is moved between operation where damage to the equipment or supply cord could occur, including electrical welders, portable bench saws, audio visual equipment, extension cords and power boards
- Where electrical safety could be affected by the operating environment:
  - Appliances used in wet areas such as kettles and other kitchen appliances
  - Electrical equipment is used in an environment where it is exposed to moisture, heat, vibration, mechanical damage, corrosive chemicals or dust
- Extension cords used externally are to have portable RCDs attached or are to be integrated as part of the extension cord.

Refer the Code of Practice Managing Electrical Risks in the Workplace -Appendix B Portable RCDs for further guidance.

**Equipment that does not need RCD protection:**

- Extra low voltage equipment (less than 50v AC)
- Equipment supplied by direct current systems
- Equipment supplied from an isolated winding from an unearthed generator that provides an equivalent level of protection

- Equipment supplied from an isolating transformer that provides an equivalent level of protection
- Specialised scientific equipment where the use of an RCD may compromise the operation of the equipment or safety of a patient. (However, steps should be taken to ensure a high level of safety is maintained such as a more frequent and extensive testing program).

**Inspecting and testing RCDs**

The Organisational Unit must take all reasonable steps to ensure that residual current devices used at the workplace are tested regularly by a competent person to ensure the devices are working effectively.

There are two types of test required for RCDs.

- The manual push button (Trip) test, which can be performed by the user to determine the RCDs tripping function and approximate tripping time
- The leakage to Earth (10mA or 30mA leakage) operating time test - using an electrically isolated RCD test instrument.

A record of testing (other than daily testing) must be kept until the device is next tested or disposed of.

## 3.12 Documentation

The Organisational Unit is to keep testing and inspection records which are to be stored on a shared system drive

## 3.13 Records of Inspection and Testing

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| **Record to be kept by:** | Organisational Unit, Academic Unit |
| **Records** | Records of inspection and testing of electrical equipment, including:<br>• register of all electrical equipment<br>• record of formal inspection and tests<br>• repair register and<br>• record of all faulty equipment showing details of services or corrective actions. |
| **To be kept for:** | Records should be kept in alignment with the Records Management Policy and Guidelines |

# 4 Definitions and Acronyms

| Term/Acronym | Definition |
|---|---|
| Academic Unit | Means the secondary organisational unit in the academic structure of the University, reporting directly to the College Executive Deans, as per Ordinance 14 – Academic Structure. |

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|---|---|
| **Competent Person** | In accordance with the WHS Regulations "a person who has acquired through training, qualification or experience the knowledge and skills to carry out the task" |
| **Hostile operating environment** | A workplace where the electrical equipment or flexible supply cord, RCD, is, in its normal use, subject to operating conditions that are likely to result in damage to the equipment. This includes an operating environment that may: cause mechanical damage to the item of equipment, or expose the item of equipment to moisture, heat, vibration, corrosive substances or dust. |
| **Low-risk environment** | Include those workplaces that are dry, clean, well-organised and free of conditions that are likely to result in damage to electrical equipment. |
| **Organisational Unit** | College, Faculty, School, Centre, University Institute, other University Entity, Division, Section or University Business Enterprise. |
| **Residual Current Device - RCD** | Residual Current Device (current-operated earth-leakage devices) An RCD is a safety device that monitors electrical current flowing within a circuit from the meter box or distribution board.<br>If the RCD detects an imbalance in the electrical current, indicating a leakage to earth, e.g. current flows through someone's body to earth, the RCD immediately cuts the electricity supply to prevent electrocution. |

## 5 Supporting Documentation

- Code of Practice: Managing Electrical Risks in the Workplace
- Australian Standard
  - AS/NZS 3003:2011 *Electrical Installations – patient areas*
  - AS/NZS 3190:2011 – *Approval and test specification – Residual current devices current-operated earth-leakage devices*
  - AS/3551:2004 *Technical management programmes for medical devices*
  - AS/NZS 3760-2010 – *In-service safety inspection and testing of electrical equipment*
- Safe Work Autralia
  - FACT SHEET: Electrical Risks in the Workplace

## 6 Versioning

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|---|---|
| **Former Version(s)** | Version 1 – Electrical Inspection, Testing and Tagging of Electrical Equipment Procedure; approved November, 2013, amended in December 2016 to incorporate Colleges. |
| **Current Version** | Version 2 – *Electrical Inspection, Testing and Tagging of Electrical Equipment Procedure* (current document); approved |

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|---|---|
| | November, 2013, amended in December 2017 to incorporate final academic structure. |

# 7 Appendices

## Appendix 1: *AS3760:2010 - Table 4*

| Type of environment &/or equipment | | Interval between inspection & tests | | | | |
|---|---|---|---|---|---|---|
| | | Equipment including Class 1 equipment, Class II equipment, cord sets, cord extension sets & EPODs | Residual current devices (RCDs) | | | |
| | | | Push-button test - by user | | Operation time & push-button test | |
| (a) | | (b) | Portable (c) | Fixed (d) | Portable (e) | Fixed (f) |
| 1. | **Hostile Operating Environment Reg 150** A workplace where the electrical equipment or flexible supply cord, RCD, is, in its normal use, subject to operating conditions that are likely to result in damage to the equipment. This includes an operating environment that may: cause mechanical damage to the item of equipment, or expose the item of equipment to moisture, heat, vibration, corrosive substances or dust. Examples include wet or dusty areas, outdoors, workplaces that use corrosive substances, commercial kitchens, and farms. | 6 months | Daily, or before every use, whichever is the longer | 6 months | 12 months | 12 months |
| 2. | Environment where the equipment or **supply** flexible **cord** is subject to flexing in normal use OR is open to abuse OR is in a **hostile environment** | 12 months | 3 months | 6 months | 12 months | 12 months |
| 3. | Environment where the equipment or **supply cord** is NOT subject to flexing in normal use & is NOT open to abuse & is NOT in a **hostile environment. Records of in service date** | 5 years | 3 months | 6 months | 2 years | 2 years |
| 4. | Residential type areas of: hotels, residential institutions, motels, | 2 years | 6 months | 6 months | 2 years | 2 years |

| | | | | | | |
|---|---|---|---|---|---|---|
| | boarding houses, halls, hostels accommodation houses & the like | | | | | |
| 5. | Equipment used for commercial cleaning | 6 months | Daily, or before every use, whichever is the longer | N/A | 6 months | N/A |
| 6. | Hire equipment | Prior to hire | Including push-button test by **hirer** prior to **hire** | | N/A | N/A |
| | Hire equipment - Inspection | | N/A | | | |
| | Hire equipment - Test & Tag | 3 months | N/A | | 3 months | 12 months |
| 7. | Repaired, serviced & second hand equipment | After repair or service which could affect electrical safety, or on reintroduction to service, refer to AS/NZS 5762. | | | | |

**Notes**

a. The actual sub environment in which the equipment is located determines the row for the environment to be used in *AS3760:2010* Table 4, e.g., a computer within a non-hostile environment in an office within a workshop or laboratory would attract a test/inspection action in accordance with Row 3. Visual inspection. If on a 3 or 5 year lease scheme or less, not tested, visual inspection only. If there is no documented lease scheme or other means of identifying the period of use, the organisational units must have documented evidence of the date of in-service by tagging and inventory.
b. Low risk environment. Includes those workplaces that are dry, clean, well-organised and free of conditions that are likely to result in damage to electrical equipment, for example an office, retail shop, telecommunications centre, classroom, etc. Records of in service date recorded by tagging and inventory unless under service contract e.g. lease scheme.
c. Regulatory authorities, other standards, workplace safety requirements or manufacturer's instructions may specify intervals appropriate to particular industries or specific types of equipment.
d. Only equipment in use needs to be tested - equipment that is used irregularly can be tested immediately prior to use.
e. All workshop hand tools should be double insulated. Consider replacement with cordless equipment.
f. Unique experimental equipment: testing regime and frequency to be determined by work area for each case.
g. Fixed/ stationary equipment connected by a cable or flexible cord which is not flexed in normal use or exposed to damage nor in a hostile environment, is not normally considered to represent a hazard sufficient to warrant routine in-service electrical safety testing. However, where the flexible cable or cord is flexed on equipment which is moved for restocking, maintenance, cleaning, etc., in-service testing is considered to be required.

## Appendix 2: A guide to typical test and tag frequencies for common appliances

The table below can be used as a guide to typical test and tag frequencies for common appliances found on campus. This table is based on Table 4 in AS/NZS 3760:2010 (see Appendix 1 of this Guideline).
Factors to consider in evaluating the risk to health and safety and in determining the appropriate inspection and test intervals include: mobility of equipment, flexion of cord and the environment where the equipment is used.
Additional tests may be undertaken to determine the safety of electrical equipment where required at the discretion of the relevant supervisor and in consultation with staff members.

### Examples of common appliances with testing frequency

| Area | Appliance | Test and Tag Frequency |
|---|---|---|
| Kitchenette | Kettle | 12 months |
| | Toaster | 12 months |
| | Sandwich press | 12 months |
| | Coffee machine | 12 months |
| | Fridge | Not required if no lead flexion or 2 years if infrequent flexion for example, cleaning |
| | Wall mounted urn | Not required |
| | Microwave | Not required if no lead flexion, or 2 years if lead flexion |
| Laboratory | Any appliance that is moved and cord is often flexed<br>Egg: microscope | 12months or 6 months if hostile environment/corrosive chemicals present |
| | Any equipment that is portable or could be portable | 12 months |
| | Extension leads | 6 months |
| | Power boards | 6 months |
| | Fridges | 5 years or 2 years if infrequent lead flexion for cleaning etc. |
| | Freezers | 5 years |
| | Equipment with low level of cord flexion | 2 years |
| Lecture theatre/teaching area | Smart boards or interactive boards | 12 months |
| | Overhead projectors | 12 months if high level of cord flexion or 5 years if low level of cord flexion or infrequent use |
| Theatre/studio | Lighting poles | 6 months if high level of cord flexion, or 12 months if low level of cord flexion/frequency of use |
| | Stage lights | 6 months if high level of cord flexion, or 12 months if low level of cord flexion/frequency of use |
| | Audio equipment | 6 months if high level of cord flexion, or 12 months if low level of cord flexion/frequency of use |

| Area | Appliance | Test and Tag Frequency |
|---|---|---|
| Workshop | Powered hand tools | 6 months if high level of cord flexion or 12 months if low level flexion/frequency of use |
| Office | Laptop computer- lead only | 12 months |
| | Desk top computer – leads only | 5 years |
| | Photocopiers and printers | Not normally required |
| | Heaters | 12 months if high level of cord flexion or 2 years if no flexion or not in hostile environment |
| | Fans | 12 months if high level of cord flexion or 2 years if no flexion or not in hostile environment |
| | Radios | 12 months if high level of cord flexion/in a hostile environment or 2 years if no flexion or not in hostile environment |
| | Equipment chargers (phone, iPad, camera) | Visual inspection only |