

ELECTRICAL SAFETY PROCEDURES

1. Electrical Safety

Mains electrical voltages are a significant hazard. As such, health and safety policies as well as electrical requirements for safety apply. This document details administrative procedures for electrical safety at Massey University.

2. Responsibilities for Electrical Safety

2.1. Fixed Wiring and equipment

All fixed wiring and equipment is to be supervised by campus Regional Facilities. This includes testing of protection devices as required and any alterations to fixed wiring. There are specific requirements in areas where moisture occurs, flammable liquids and gases, laboratories, physiology suites and operating theatres.

Approval for any changes or alteration to fixed electrical wiring must be obtained from relevant campus Regional Facilities Management.

Relevant Standards that need to be followed include:

- AS/NZS 3000, Electrical installations (known as Australian/New Zealand Wiring Rules) and Amendments
- AS/NZS 2982 Part 1 – Laboratory design and construction, Part 1, General Requirements
- AS/NZS 2430.3.6 – Classification of Hazardous Areas. Part 3.6: Examples of Area Classification – Laboratories including Fume Cupboards and Flammable Medical Agents.
- AS/NZS 2243 – Laboratory Safety. The Standards have a number of parts covering different types of specialist laboratories.
- AS/NZS 3003 Electrical installations – Patient areas of hospitals, medical and dental practices and dialyzing locations.
- AS/NZS 3003.1 – Patient areas of hospital and medical and dental practices – testing requirements.

2.2. Electrical Equipment:

Any repair work with electrical equipment where the voltage in the area being repaired is above 32volts AC or 115volts DC (i.e. prescribed electrical work) must be done by or supervised by a Registered Electrical Worker with a current Practising Certificate.

Examples of work, which can be completed by staff who are not Registered Electrical Workers includes:

- Replacing a network card that does not involve removing covers which give access to voltages above 32 volts AC or 115 volts DC.

- Mechanical repair to laboratory equipment that does not involve removing covers which allows access to electrical circuits with voltages above 32 volts AC or 115 volts DC.
- Operating or unplugging of equipment.
- Changing a light bulb or projector bulb where access to the bulb doesn't involve removing covers where access to voltages above 32 volts AC or 115 volts DC occurs.

Examples of work requiring registration as an Electrical Worker with a current Practising Certificate includes

- Changing projector bulbs where access to voltages above 32 volts AC or 115 volts DC occurs.
- Fitting a. mains rated connector to equipment or cables
- Repairs to power supplies or switches and equipment.
- Changing a power supply in a computer where the power supply is externally switched.

It should be noted that some of the above work can be undertaken by homeowners in a home setting only. People who have done such work at home are not able to do this at work unless they are a Registered Electrical Worker with a current Practising Certificate.

2.3. Statutory Inspection following Repair to an Equipment:

A full electrical inspection and test as described in Standards AS/NZS 3760 (In Service Safety Inspection and Testing of Electrical Equipment) is to be completed if the repair involves access to mains voltage.

This testing is mandatory and must be undertaken by any University staff or external companies who service or repair electrical equipment. It should be noted that the testing is invoked where mechanical repair is undertaken where the mechanical repair involves removing covers, which give access to mains voltages.

3. Routine Testing and Inspection of Electrical Equipment:

Electrical equipment and portable electrical equipment must be tested prior to purchase by the supplier and tagged with the date prior to service. Tests shall be done thereafter as per the table of testing and inspection intervals (from AS/NZS 3760) in section 7 of this report. Responsibility for routine testing is as follows.

3.1. Rooms with Specialist Equipment

Departments, Schools, Institutes and Sections which have rooms containing specialised electrical equipment which is “owned” by them must arrange for required periodic testing as per AS/NZS 3760 of all electrical equipment in the room to ensure electrical safety during routine use.

Specialised electrical equipment includes equipment used in the following areas:

- Laboratories (ie includes computer, language, mechanical, and “bench” laboratories)
- Workshops
- Farms
- Research Centres
- Teaching equipment in centrally timetabled rooms (including AV and IT equipment).
- Catering areas and student halls of residence.

Specialised equipment will include equipment that has specialised requirements such as: use in wet areas, use in construction, flameproof, biomedical use, body protection and/or cardiac protection use. In some instances, additional technical registrations will be needed where equipment repairs are undertaken. For example irradiating equipment can be required by people with Electrical Worker Registration and Radiation Equipment maintenance licence.

In addition to periodic testing of specialised equipment it is the responsibility of Departments, Schools, Institute and Sections to ensure that testing following repair is undertaken as in section 2.3 of this procedure.

3.2. Non Specialised Equipment

Electrical equipment in offices and shared spaces are the responsibility of the Regional Facilities Management. Routine testing is to be undertaken as per the Standard AS/NZS 3760.

4. **Verification of Testing**

All tested equipment must be tagged following the test as per AS/NZS 3760. The tag must detail the following:

- Name of the person or company that performed the test.
- The test, or retest date.

The background colour of the tag is to be used to indicate the test year as in the following schedule. Where testing is more frequent than annually, the test date will need to be read to determine if equipment is still within the test period.

<u>Year</u>	<u>Tag Colour</u>	<u>Year</u>	<u>Tag Colour</u>
		2011	Blue
		2012	Green
2003	Orange	2013	Orange
2004	Red	2014	Red
2005	Yellow	2015	Yellow
2006	Blue	2016	Blue
2007	Green	2017	Green
2008	Orange	2018	Orange
2009	Red	2019	Red
2010	Yellow	2020	Yellow

Non-compliant equipment must be:

- Withdrawn from service immediately.
- Sent for repair, disposal or destruction by a Registered Electrical Worker with a current Practising Certificate.

5. Scope of Equipment to be Tested

- All laboratory equipment.
- All equipment used in teaching spaces.
- All equipment in common rooms and office kitchens.
- All office equipment where the supply cord is subject to flexing in normal use - example, extension leads, portable fans, heaters.

Where the supply cord to the equipment is not subject to flexing in normal use, a testing regime of five years is acceptable. Such equipment may include faxes, fixed computers and printers that are normally in a stationary location.

6. Requirements for Staff Undertaking Testing and Inspection of Electrical Equipment

Staff undertaking electrical tests must be competent as defined by AS/NZS 3760. Specialised electrical equipment is also required to undertake some tests. Access to PAT testers in each workshop is required. Staff members who undertake equipment repairs outside of a central workshop will need to be supplied with portable PAT testers.

Where existing in-house resources do not have appropriate expertise and equipment then arrangements should be made either with other Institutes or Department who can support electrical testing or alternatively sub-contract equipment testing. Organisations that undertake testing are listed in yellow pages under Electrical Equipment Repairs and Services. Outsourcing of testing should be arranged with the assistance of the Procurement and Insurance Manager's office.

7. Use of Personally Owned Electrical Equipment

Where a staff member uses personally owned electrical equipment for work purposes, the staff member must arrange for this equipment to be tested prior to use on campus and inspected as required by this procedure. The cost of testing is the staff member's responsibility.

Students may bring electrical equipment in to accommodation rooms for personal use. The equipment must comply with the specification in accommodation handbooks. It is strongly recommended for student well being the equipment is tested to confirm its safety.

Where students' use personally owned electrical equipment in teaching and research, it must be tested and inspected as required by this procedure. The cost of testing is the student's responsibility.

8. Accident Reporting

Serious injury, death or fire caused by electricity, must be reported to the Electrical Safety Service. Further information is available in the accident reporting section of safety website.

Serious injury is: Loss of consciousness that requires hospital admission or medical treatment from a health care professional.

Fire: Is of an extent that the place or part of a place cannot be used for its intended design before the accident.

Serious injury will also require notification to Department of Labour.

8. Testing and Inspection Intervals for Electrical Equipment (This page is reproduced from AS/NZS 3760 (2003))
(Caution: This page must be read in conjunction with the Standard as a whole, and particularly Clause 2.1)

Type of environment and/or equipment (a)	Interval between inspection and tests						Cord sets and power boards (h)
	Class of equipment		Residual Current Devices (RCDs)				
	Class I (Protectively earthed) (b)	Class II (double insulated) (c)	Push-button test by user		Operating time and push-button test		
			Portable (d)	Fixed (e)	Portable (f)	Fixed (g)	
1. Factories, workshops, places of work or repair, manufacturing, assembly, maintenance or fabrication	6 months	12 months	Daily, or before every use, whichever is the longer	6 months	12 months	12 months	6 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	12 months	3 months	6 months	12 months	12 months	12 months
3. Environment: where the equipment or supply cord is NOT subject to flexing in normal use and is NOT open to abuse and is NOT in a hostile environment.	5 years	5 years	3 months	6 months	2 years	2 years	5 years
4. Residential type areas of: hotels, residential institutions, motels, boarding houses, halls, hostels accommodation houses, and the like.	2 years	2 years	6 months	6 months	2 years	2 years	2 years
5. Equipment used for commercial cleaning	6 months	12 months	3 months	N/A	12 months	N/A	12 months

Type of environment and/or equipment (a)	Interval between inspection and tests						Cord sets and power boards (h)
	Class of equipment		Residual Current Devices (RCDs)				
	Class I (Protectively earthed) (b)	Class II (double insulated) (c)	Push-button test - by user		Operating time and push-button test		
			Portable (d)	Fixed (e)	Portable (f)	Fixed (g)	
6. Hire equipment:							
Inspection	Prior to hire		Including push-button test by hirer prior to hire		N/A	N/A	Prior to hire
Test and tag	3 months		N/A		3 months	12 months	3 months
7. Repaired, serviced and second-hand equipment.	After repair or service which could affect electrical safety, or on reintroduction to service.						
8. New Equipment	Inspection, testing and tagging is required prior to use in service.						

NOTES:

- 1 The actual sub-environment in which the equipment is located determines the row for the environment to be used in Table 4. e.g. A computer in a non-hostile environment in an office within a factory would attract a test/inspection action in accordance with Row 3.
- 2 Regulatory authorities, other Standards, workplace safety requirements or manufacturers' instructions may specify intervals appropriate to particular industries or specific types of equipment.
- 3 RCDs in transportable equipment shall be regarded as portable RCDs
- 4 The following Standards refer only to the inspection and testing method of Clause 2.3 of this Standard, but not to the intervals of testing in Table 4 above. Refer to the appropriate Standards for specific test intervals:
 - AS 1674.2 Safety in welding and allied processes - Electrical
 - AS/NZS 3001 Electrical installations – Re-locatable premises (including caravans and tents) and their site installations
 - AS/NZS 3002 Electrical installations – Shows and carnivals
 - AS/NZS 3003 Electrical installations –Patient treatment areas of hospitals and medical and dental practices and dialysing locations
 - AS/NZS 3004 Electrical installations –Marinas and pleasure craft at low voltage
 - AS/NZS 3012 Electrical installations –Construction and demolition sites
 - AS/NZS 4249 Electrical safety practices – Film, video and television sites

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