

# FACT SHEET—ELECTRICAL RISKS AT THE WORKPLACE

This fact sheet provides general guidance for persons conducting a business or undertaking (PCBUs) and workers on managing electrical risks at the workplace. It does not cover electrical risks arising from overhead or underground electric lines.

This fact sheet should be read together with the relevant work health and safety (WHS) [Codes of Practice](#) and any applicable transitional arrangements.

## What is an electrical risk?

An electrical risk is a risk to a person of death, shock or other injury caused directly or indirectly by electricity. The main hazards associated with these risks are:

- contact with exposed live parts causing electric shock and burns (for example exposed leads or other electrical equipment coming into contact with metal surfaces such as metal flooring or roofs)
- faults which could cause fires
- fire or explosion where electricity could be the source of ignition in a potentially flammable or explosive atmosphere (for example in a spray paint booth).

The risk of injury from electricity is strongly linked to where and how it is used. The risks are greatest in harsh conditions, for example:

- outdoors or in wet surroundings—equipment may become wet and may be at greater risk of damage
- in cramped spaces with earthed metalwork, such as inside a tank or bin—it may be difficult to avoid electrical shock if an electrical fault develops.

Some items of equipment can also involve greater risk than others. Portable electrical equipment is particularly liable to damage including to plugs and sockets, electrical connections and to the cable itself. Extension leads, particularly those connected to equipment which is frequently moved, can suffer from similar problems.

## General duty to manage electrical risks

PCBUs must manage electrical risks at the workplace. When managing electrical risks, the risks must be eliminated so far as is reasonably practicable. If elimination is not reasonably practicable, the risks must be minimised so far as is reasonably practicable.

For more information on managing risks refer to the [Code of Practice: How to Manage Work Health and Safety Risks](#).

## General duty in relation to electrical equipment

Any PCBU with management or control over electrical equipment (including an electrical installation) must ensure, so far as is reasonably practicable, that the equipment is safe to use. See below for examples of common risk control measures.

If a PCBU's workers, including contractors, are required or allowed to use electrical equipment at a workplace shared by multiple PCBUs (for example at a construction site) then the PCBU must ensure, so far as is reasonably practicable, that the equipment is safe to use. This duty applies regardless of whether the PCBU owns or supplied the electrical equipment.

## Common risk control measures

Common measures to control electrical risks at a workplace include:

- ensuring only appropriately licensed or registered electricians carry out electrical work
- providing safe and suitable electrical equipment for example not using leads and tools in damp or wet conditions unless they are specially designed for those conditions
- inspecting leads for damage before use and removing any that are damaged from the workplace.
- providing enough socket outlets—overloading socket outlets by using adaptors can cause fires
- ensuring power circuits are protected by the appropriate rated fuse or circuit breaker to prevent overloading
- if the circuit keeps overloading—not increasing the fuse rating as this creates a fire risk due to overheating
- using battery powered tools instead of mains operated where possible
- so far as is reasonably practicable arranging electrical leads so they will not be damaged:
  - not running leads across the floor or ground, through doorways and over sharp edges
  - using lead stands or insulated cable hangers to keep leads off the ground
  - using cable protection ramps or covers to protect cables and cords, where applicable
- using Residual Current Devices (RCDs) (also known as ‘safety switches’) to protect workers using portable equipment as required by the WHS Regulations
- determining the reason why an RCD, circuit breaker or other over current protective device disconnected the electricity before it is switched back on
- ensuring RCDs are effective by regular testing
- carrying out preventative maintenance on electrical equipment as appropriate for example an appropriate system of visual inspection and where necessary, testing.

## Unsafe electrical equipment

PCBUs must ensure that any unsafe electrical equipment within their management or control is disconnected or isolated from its electricity supply and once disconnected is not reconnected until it is repaired or tested and found to be safe or is replaced or permanently removed from use.

Consider implementing the following procedures to ensure unsafe equipment is not used at a workplace:

- procedures requiring the physical condition of electrical equipment including the lead and plug connections to be checked prior to use, as appropriate
- procedures for taking the electrical equipment out of service if there is any doubt as to electrical safety, including during use
- procedures for reporting faulty equipment.

## Electrical equipment used by carers in other people’s homes

PCBUs that direct or allow workers to work in other people’s homes as carers or in similar capacities must do what is reasonably practicable to ensure the safety of the workers.

For example PCBUs must put arrangements in place to ensure that workers do not use unsafe electrical equipment whether supplied by them or the home owner. This could include putting procedures in place that require electrical equipment that is reasonably believed to be unsafe to be disconnected or isolated. Such equipment must not be used by workers until repaired or tested and found to be safe.

Alternatively workers could be supplied with portable RCDs to use with plug-in electrical equipment and supplied with suitably maintained electrical equipment (for example vacuum cleaners) so they do not have to use the client's equipment.

Additionally PCBUs must ensure their workers have suitable information, training, instruction and (if necessary) supervision to allow them to carry out work in other people's homes without risks to health or safety, so far as is reasonably practicable. This includes suitable training on electrical risks in domestic settings, and on the PCBU's procedures to eliminate or minimise those risks.

### **Inspecting and testing electrical equipment—general workplaces**

Inspecting and testing electrical equipment will help determine whether it is electrically safe.

Regular visual inspection can identify obvious damage, wear or other conditions which might make electrical equipment unsafe. Many electrical defects are detectable by visual inspection for example, damaged cords.

Regular testing can detect electrical faults and deterioration that cannot be detected by visual inspection.

The nature and frequency of inspection and testing depends on factors such as the nature of the electrical equipment, how it is used and its operating environment.

The WHS Regulations have specific requirements for electrical equipment used in a 'hostile operating environment'.

#### **What is a 'hostile operating environment'?**

A 'hostile operating environment' is a term used to describe an environment where 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.

This includes conditions that involve exposing the electrical equipment to moisture, heat, vibration, mechanical damage, corrosive chemicals and dust.

Examples include wet or dusty areas, outdoors, workplaces that use corrosive substances, commercial kitchens, and manufacturing environments.

#### **Inspecting and testing electrical equipment—hostile operating environments**

Electrical equipment that is connected by a plug and socket—in essence 'plug in' electrical equipment—that is used in a 'hostile operating environment' (as described above) must be regularly inspected and tested by a competent person. If this equipment has not been regularly tested then it must not be used until it is tested.

Brand-new equipment that is 'out of the box' does not need to be tested before being put into service unless there are reasonable grounds to believe it is electrically unsafe.

As a general rule electrical equipment used in 'hostile operating environments' should be inspected and tested at least once every 12 months. More frequent testing will be required where plug-in equipment is exposed to increased risks of mechanical damage or electrical deterioration, for example:

- electrical equipment used in manufacturing and work shop environments (for example at least once every 6 months)
- commercial cleaning equipment (for example at least once every 6 months)
- hire equipment (see below).

In addition to regular inspection and testing plug-in electrical equipment should also be tested:

- after a repair or servicing that could affect the electrical safety of the equipment in essence undertaken by the person carrying out the repair or servicing before return to use
- before first use if bought second-hand
- if there is no record of it being tested previously.

Further guidance on indicative testing intervals can be found in AS/NZS 3760:2010 *In-service safety inspection and testing of electrical equipment* and the manufacturer's recommendations (if any).

### **Hire equipment**

PCBUs hiring out electrical equipment must ensure it is inspected and tested at the commencement of each hire and tested every three months.

For extended hires the PCBU using the electrical equipment must ensure it is inspected and tested at the intervals applicable to the type of workplace where the equipment is being used.

### **Who is competent to carry out inspection and testing of electrical equipment to meet these requirements?**

Inspection and testing of electrical equipment under the WHS Regulations must be carried out by a competent person—someone who has acquired through training, qualification or experience the knowledge and skills to carry out the task. Examples include:

- a licensed or registered electrician (whichever applies in the jurisdiction)
- in some jurisdictions—a licensed electrical inspector
- 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.

### **Records of testing—electrical equipment used in hostile operating environments**

A record of testing of electrical equipment used in a 'hostile operating environment' must be kept until the electrical equipment is next tested or permanently removed from the workplace or disposed of. A 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, and
- the date on which the next testing must be carried out.

The record may be in the form of a tag attached to the tested electrical equipment.

### **Inspecting and testing electrical equipment—construction and demolition sites**

AS/NZS 3012: 2010 *Electrical installations—Construction and Demolition Sites* applies in relation to the inspection and testing of electrical equipment on construction and demolition sites (including record keeping requirements).

As a general rule electrical equipment connected by a plug and socket that is used on construction and demolition sites should be inspected and tested at least once every three months. More frequent testing may be required as indicated by a site-specific risk assessment.

## Requirements for RCDs (also known as 'safety switches')—hostile operating environments

Transitional arrangements may apply so you should check with the WHS regulator about the commencement date for these requirements in your jurisdiction.

If reasonably practicable, RCDs must be used to protect workers using 'plug in' electrical equipment in 'hostile operating environments' (as described above).

RCD requirements also apply to operating environments where the electrical equipment:

- is moved between different locations in circumstances where damage to the equipment or to a flexible electricity supply cord is reasonably likely
- is frequently moved during normal use
- forms part of or is used in connection with an amusement device.

If it is reasonably practicable for an RCD to be provided, the RCD must have a tripping current that does not exceed 30 milliamps for socket outlets not exceeding 20 amps.

This requirement does not apply if the supply of electricity to the electrical equipment:

- does not exceed 50 volts alternating current
- is direct current
- is provided through an isolating transformer that provides at least an equivalent level of protection, or
- is provided from a non-earthed socket outlet supplied by an isolated winding portable generator that provides at least an equivalent level of protection.

## Maintenance and testing of RCDs

Where provided for use in a workplace RCDs must be fit for purpose, maintained so as to be effective and tested regularly.

## Non-portable and portable RCDs if RCD requirements apply

The WHS Regulations do not mandate whether RCDs (where required) should be non-portable or portable. The choice of appropriate RCD will depend on all relevant circumstances, including for example, the degree to which the PCBU has management or control of the electrical installations at the workplace.

## Provision of RCDs at shared workplaces

If RCD requirements apply at a workplace all PCBUs at the workplace have responsibility, so far as is reasonably practicable, to ensure compliance with the legal requirements.

At a shared workplace PCBUs will usually have varying degrees of control over certain parts of the physical workplace, for example their ability to have non-portable RCDs installed at the switchboard.

In these circumstances all PCBUs with a shared responsibility at a workplace must consult and co-operate with each other to ensure compliance with the legal requirements.

Each PCBU retains responsibility, for ensuring appropriate RCD protection is provided, and must discharge their duty to the extent to which the person has the capacity to influence or control the matter, disregarding any attempts to 'contract out' of the duty.

## **Testing RCDs—all workplaces**

PCBUs with management or control of a workplace must take all reasonable steps to ensure that RCDs used at the workplace are tested regularly by a competent person to ensure the devices are working effectively.

A record of testing—other than daily push button tests—must be kept until the RCD is next tested or disposed of.

RCD testing requirements apply to both portable and non-portable devices. Portable RCDs will also require testing as portable electrical equipment if used in a 'hostile operating environment'.

For example if workers use portable RCDs as part of their work for example, portable RCDs used by contract cleaners, then the PCBU directing the work must ensure the RCDs are tested regularly.

## **Requirements for RCDs construction and demolition sites**

AS/NZS 3012: 2010 applies in relation to the provision and testing of RCDs on construction and demolition sites (including record keeping requirements).

## **More information**

More work health and safety resources are available on the [Safe Work Australia website](#).

## **Disclaimer**

Note: this fact sheet provides general information only and should not be used as a substitute for seeking professional legal advice for your specific circumstances. The contents of this fact sheet are correct and based on available information at the time of writing. However, there may be subsequent decisions of courts or tribunals on the matter covered by this fact sheet which mean that the contents are no longer accurate.