

# Electrical Safety

Identify hazards and control the risks of injury from exposure to electricity.

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## What is an electrical hazard?

An electrical hazard occurs when it is possible to come into contact with electricity. This can happen directly through energised parts of electrical equipment or through indirect pathways such as conductive materials.

The main hazards associated with electrical equipment include:

- contact with exposed live parts, which may cause electric shock and burns (for example, exposed leads or other electrical equipment coming into contact with metal surfaces, such as metal flooring or roofs)
- equipment faults, which may cause fires and cause electric shock injury
- 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)

## Working safely with electricity

Sheds have a duty to provide and maintain, so far as is reasonably practicable, a workplace that is safe and without risks to health.

They must also provide and maintain safe systems of work for shedders involved in the provision, use, inspection and maintenance of electrical equipment, including all electrical installations, under the sheds management and control.

To meet their obligations and provide a safe system of work, sheds should identify potential electrical hazards in the workplace, assess the risks, implement appropriate risk controls and have procedures in place to review and maintain those controls.

# Identify hazards

Hazards may come from the type of electrical equipment used, how and where it is used, where it is stored, and how it is maintained.

Hazards are more likely to occur when using:

- portable electrical equipment and extension leads, particularly when they are frequently moved, as plugs, sockets, electrical connections and cables are particularly prone to damage
- equipment in cramped spaces with earthed metalwork, such as inside a tank or bin, where it may be difficult to avoid electric shock if an electrical fault develops
- equipment outdoors or in wet surroundings, for example commercial kitchens, construction sites and hostile environments

## A hostile environment is

One where heat, UV, moisture, vibration, sharp objects, corrosive chemicals or dust are present. For example, construction sites, manufacturing areas within workshops in which maintenance or fabrication activities occur.

## Assess the risks

Sheds should evaluate the risks for each identified hazard associated with the electrical equipment used in the workplace. The degree and likelihood of shedders being exposed to those hazards should also be assessed.

In assessing risks, sheds should take into account the:

- type of equipment being used
- environmental conditions
- likelihood of damage to the equipment
- risk of shedders being exposed to energised parts
- manufacturers' recommendations, for example whether the equipment is suitable for domestic or commercial use

## Implement risk controls

When the risks have been assessed, consider which risk controls are appropriate in the circumstances. When it is not reasonably practicable to eliminate a risk associated with electrical exposure, employers must reduce the risk by implementing the highest level of risk control, or combination of risk controls, that are reasonably practicable in the circumstances.

When determining which risk controls are appropriate, consider:

- what are the known risk controls for the identified electrical hazard?
- what risk controls are currently in place?
- is the equipment periodically inspected and tested?
- are leads and equipment being regularly checked for wear, damage and faults through visual inspections before they are used?
- are procedures in place to report damaged and/or faulty equipment and ensure it is promptly taken out of service to be replaced or repaired?
- are residual current devices (RCDs), also known as safety switches, or other measures such as isolation transformers or extra low voltage equipment, in place to ensure that employees are not injured if they come into contact with exposed energised parts?

## Common risk control measures

Reduce common hazards and risks with the following control measures:

- ensure only competent persons, such as appropriately licensed or registered electricians, carry out repairs to electrical installations
- provide safe and suitable electrical
- provide enough individual socket outlets for equipment
- avoid overloading socket outlets or using socket adaptors that can cause fires
- ensure power circuits are protected by the appropriate rated fuse or circuit breaker to prevent overloading (if a circuit overloads, do not increase the fuse rating as this creates a fire risk due to overheating)
- use battery powered equipment instead of mains operated, where possible

## Extension leads

- not running leads across the floor or ground, through doorways or 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

## RCDs

- use RCDs on portable equipment to prevent exposure to electrical shock
- if the likelihood of electric shock cannot be reduced through changes to the use of leads or the environment in which they are used, fit RCDs to the circuit to limit the consequence of an electric shock
- ensure the particular type of RCD used in the workplace is fit for purpose and maintained and tested regularly

## Inspections, testing and tagging

A visual inspection of leads and equipment should always be conducted before use to ensure there is no damage. Damage may include:

- cuts, fraying, heavy scuffing,
- damage to plug, bent pins, taped leads,
- coloured wires are visible,
- signs of overheating such as burn marks or staining on the plug

Regular testing and tagging of electrical equipment is necessary to detect electrical faults and deterioration that cannot be found by visual inspection.

The nature and frequency of inspection and testing depends on factors such as the type of electrical equipment, the operating environment and how it is used (see tables 1 and 2).

## Be aware that

A piece of electrical equipment that has a test tag does not necessarily mean that the equipment is in a safe state of repair. For example, it may have been damaged between testing and tagging intervals. Always ensure that damaged equipment is not used, and is discarded or repaired by a competent person.

For detailed information about recommended timeframes for inspection, testing and tagging of portable electrical equipment in different environmental conditions and types of workplaces, see AS/NZS 3760: 2010 In-service safety inspection and testing of electrical equipment.

RCD push button tests (conducted by user) in high, medium and low risk areas

Area	Portable	Fixed
High risk areas where the environment AND the use increases the risk of cable damage or shortening of life expectancy	Daily (on each day when in use)	6 monthly
Low risk area where the environment is not hazardous AND the use does not pose an increased risk to cables	3 monthly	6 monthly
Medium risk area where either the environment OR the use may increase the risk of damage or shortening of life expectancy	3 monthly	6 monthly

Measurement of operating/trip time in high, medium and low risk areas

Area	Portable	Fixed
High risk areas where the environment AND the use increases the risk of cable damage or shortening of life expectancy	12 monthly	12 monthly
Low risk area where the environment is not hazardous AND the use does not pose an increased risk to cables	2 yearly	2 yearly
Medium risk area where either the environment OR the use may increase the risk of damage or shortening of life expectancy	12 monthly	12 monthly

Information, instruction, training and supervision

Sheds have a duty to provide any necessary information, instruction, training and supervision to shedders so that they can use electrical equipment safely in the workshop.

This includes information about:

- the safe systems of work used at the workplace, such as the use of residual current devices or equipment replacement programs
- the process to raise concerns with the use of electrical equipment, including how and when to report damaged equipment
- the electrical safety requirements at the workplace, including commercial and retail environments where public safety requirements are high
- who is able to undertake inspection and testing of electrical equipment and installations (for example, someone who is suitably trained or a licensed electrician).

## Always ensure

Work is undertaken by someone competent and suitably qualified. For example, some people are only competent to undertake a pass/fail test of electrical equipment, while a licenced electrician is also able to repair equipment defects identified in testing/tagging.

## Review and maintain risk controls

To ensure that a safe system of work is maintained, an employer should regularly review the risk controls in place. Risk controls should also be reviewed after an incident and whenever there is a change in work practice or work design (for example, a change of work environment).

Employers should keep records of electrical safety maintenance programs, including any testing and tagging of equipment. These records should be made available for review and inspection.

## Reference

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

