

Introduction to electrical safety

Electricity can kill or severely injure people and cause damage to property.

However, you can take simple precautions when working with or near electricity and electrical equipment to significantly reduce the risk of injury to you, your workers and others around you.

This page provides a summary of those precautions.

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The main electrical hazards

The main hazards of working with electricity are:

- electric shock and burns from contact with live parts
- injury from exposure to arcing (when electricity jumps from one circuit to another)
- fire from faulty electrical equipment or installations
- explosion caused by unsuitable electrical apparatus
- static electricity igniting flammable vapours or dusts, for example in a spray-paint booth

Electric shocks can also lead to other types of injury, for example by causing a fall when working from ladders or scaffolds etc.

Even incorrectly wiring a plug can be dangerous and lead to fatal accidents or fires.

Actions you must take

You must ensure an assessment has been made of any electrical hazards, which covers:

- who could be harmed by them
- how the level of risk has been established
- the precautions taken to control that risk

The risk assessment should take into consideration the type of electrical equipment used, the way in which it is used and the environment it is used in.

You must make sure that the electrical installation and the electrical equipment are:

- suitable for their intended use and the conditions in which they are operated
- only used for their intended purpose

In wet surroundings, unsuitable equipment can become live and make its surroundings live too. Fuses, circuit-breakers and other devices must be correctly rated for the circuit they protect. Isolators and fuse-box cases should be kept closed and, if possible, locked.

Cables, plugs, sockets and fittings must be robust enough and adequately protected for the working environment. Ensure that machinery has an accessible switch or isolator to cut off the power quickly in an emergency.

Maintenance

You must make sure electrical equipment and installations are maintained to prevent danger, so far as reasonably practicable. This means balancing the level of risk against the measures needed to control the real risk in terms of money, time or trouble.

Users of electrical equipment, including portable appliances, should check the equipment each time they use it and remove the equipment from use immediately if:

- the plug or connector is damaged
- the cable has been repaired with tape, is not secure, or internal wires are visible etc
- there are burn marks or stains (suggesting overheating)

Repairs should only be carried out by a competent person. This is someone who has the necessary skills, knowledge and experience to carry out the work safely.

Have more frequent checks for items more likely to become damaged, such as:

- portable electrical tools
- equipment that is regularly moved, used frequently, or likely to get damaged, for example in wet or dusty environments

Less frequent checks are needed for equipment less likely to become damaged, for example desktop computers.

Consider whether electrical equipment, including portable appliances, should be more formally inspected or tested by a competent person. Also think about the intervals at which this should be done.

An HSE guide [Maintaining portable electrical equipment in low-risk environments](#) can help you decide whether and when to carry out visual inspections and tests.

Fixed installations

Arrange inspecting and testing of fixed wiring installations to minimise deterioration leading to danger. This should cover circuits from the meter and consumer unit supplying:

- light switches
- sockets
- wired-in equipment (eg cookers, hairdryers)

The work should normally be carried out by a competent person, usually an electrician.

How do I know if someone is competent to do electrical work?

One way of demonstrating technical competence for general electrical work is to complete an electrical apprenticeship, with some post-apprenticeship experience.

More specialised work, such as maintenance of high-voltage switchgear or control system modification, is almost certainly likely to require additional training and experience.

[More information on maintaining electrical equipment](#)

Overhead electric lines

- Be aware of the dangers of working near or underneath [overhead power lines](#). Electricity can flash over from them, even though machinery or equipment may not touch them
- Don't work under them when equipment (eg ladders, a crane jib, a tipper-lorry body or a scaffold pole) could come within a minimum of 6 metres of a power line without getting advice.
- Speak to the line owner, eg the electricity company, railway company or tram operator, before any work begins

Underground cables

- Always assume there will be [underground cables](#) when digging in the street, pavement and/or near buildings
- Consult local electricity companies and service plans to identify where cables are located

Checklist of points to remember

- Ensure workers know how to use the electrical equipment safely
- Stop using equipment immediately if it appears to be faulty – have it checked by a competent person
- Make sure enough sockets are available. Check that socket outlets are not overloaded by using unfused adaptors as this can cause fires
- Ensure there are no trailing cables that can cause people to [trip or fall](#)
- Switch off and unplug appliances before cleaning or adjusting them
- Ensure everyone looks for electrical wires, cables or equipment near where they are going to work and check for [signs warning of dangers from electricity](#), or any other hazard
- Checks should be made around the job, and remember that electrical cables may be within walls, floors and ceilings (especially when drilling into these locations)
- Ensure any electrical equipment brought into the workplace by workers, or any hired or borrowed, is suitable for use before using it and remains suitable by being maintained as necessary
- Consider using a [residual current device \(RCD\)](#) between the electrical supply and the equipment, especially when working outdoors, or within a wet or confined place

Example of an avoidable accident

Refrigerated display cabinet in a café

Resources

- [HSE's electrical safety at work site](#)
- [Electrical safety and you: A brief guide \(hse.gov.uk\)](#)
- [Maintaining portable and transportable electrical equipment](#)

Related content

- [Memorandum of guidance on the Electricity at Work Regulations 1989](#)
- [Electricity at work: Safe working practices](#)
- [Dangerous substances and explosive atmospheres](#)