

The voice of the Voluntary Arts

Health & Safety in offices – Electrical equipment

Over 1,000 electrical accidents at work are reported to Health & Safety bodies across the UK and Ireland each year and more than 25 people die of their injuries. Many of these accidents involve portable appliances commonly found in offices. This briefing explains how, by conducting regular checks and tests, you can control electrical risks and prevent accidents.

As well as being a sensible precaution against damage to people and property, PAT testing (Portable Appliance Testing) is a prerequisite for many insurers and a statutory requirement under UK and Ireland Health & Safety legislation.

A. Checking and testing

I. What needs checking?

Any type of equipment that is powered by electrical energy needs to be checked, from small handheld equipment (such as phones and kettles) to large stationary appliances (such as photocopiers and fridges), as well as things like adaptors and extension leads.

The risks from portable electrical equipment used in offices are low, but if you have never had a routine inspection or if maintenance has been neglected, there is a greater chance that some equipment may have become dangerous. Using equipment especially frequently or in environments for which it was not designed also increases the risk. Leads and plugs, or sometimes the equipment itself, can become damaged and this may result in an electric shock or fire.

National Health & Safety legislation puts the duty of care upon both the employer and the employee to ensure the safety of all persons using the work premises. Organisations are responsible for the safety of all electrical equipment on site, even if it belongs to employees or contractors and has been brought in temporarily.

This briefing does not deal with electrical equipment used in entertainment, such as theatre lighting or public announcement systems, although the basic rules are the same – it has to be safe and suitable for purpose. The main differences are the rules governing its design and construction and how it is tested. More details are available by contacting the Association of British Theatre Technicians (see *Further Information & Resources* section).

2. How do we check?

There are three procedures to follow. The first two may be carried out by a specified and competent member of staff. The third, however, is best left to trained professionals. The National Inspection Council for Electrical Installation Contracting (NICEIC), the Electrical Contractors Safety and Standards Association (ECSSA) and the Register of Electrical Contractors of Ireland (RECI) all maintain lists of approved contractors capable of safe, good quality work.

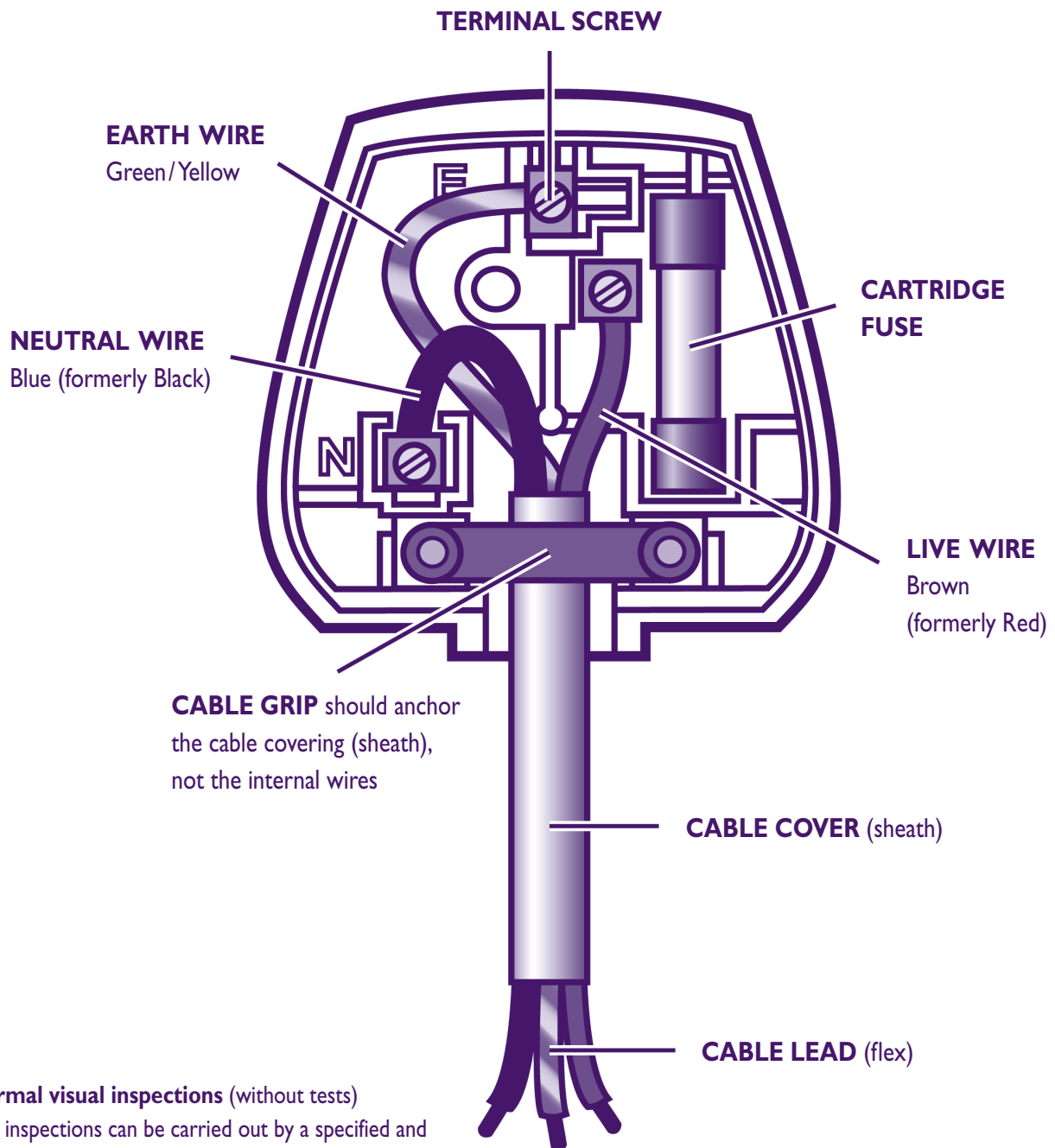
a. User checks

Most faults or damage can be found just by carefully inspecting the electrical equipment. Check when you start using your equipment and then regularly during use. Any faults should be recorded and the equipment taken out of use immediately. Disconnect and then inspect the OUTSIDE (do not take the plug apart) of the equipment, cable and plug for:

- damage, e.g. cuts or abrasions to the cable covering;
- damage to the plug, e.g. the casing is cracked or the pins are bent;
- non-standard joints, including taped joints, in the cable;
- the outer covering of the cable not being gripped where it enters the plug or equipment;
- the coloured insulation of the internal wires. It shouldn't be showing;
- equipment that has been used in conditions where it is not suitable, such as a wet or dusty workplace;
- damage to the outer cover of the equipment or obvious loose parts;
- overheating (burn marks).



Standard electrical plug



b. Formal visual inspections (without tests)

Visual inspections can be carried out by a specified and competent member of staff who knows what to look for and how to avoid danger to themselves and others.

This visual inspection should not include taking the equipment itself apart since this could damage the equipment and may be dangerous. However, it should include, when disconnected from the mains supply, the removal of the plug cover and checking that:

- the cord grip is holding the outer sheath of the cable tightly;
- the wires, including the earth where fitted, are attached to the correct terminals;
- no bare wire is visible other than at the terminals;
- the terminal screws are tight;
- there is no sign of internal damage, overheating or entry of liquid, dust or dirt.

Some appliances (such as kettles) have plugs that are moulded from plastic rather than screwed together, allowing access to the fuse but not the internal wiring. **Do not** attempt to open this kind of plug. If you have reason to believe the appliance is faulty, replace it immediately or consult an electrician.

You do not necessarily need professional qualifications to be classed as 'competent'. Simple situations may require only an understanding of best practice, according to the guidelines published by the UK and Ireland Health & Safety bodies. An awareness of your own limitations is important, as is a willingness to obtain external help if required.

If in doubt, seek professional help and/or training.



c. Combined inspection and test

The two procedures above will identify most (but not all) potentially dangerous faults that may be expected after significant use. Where there is reason to suspect that equipment may be faulty, damaged or contaminated (and where this cannot be confirmed by user checks and visual inspections alone), combined inspection and testing (e.g. with instruments) should be carried out by a trained professional with sound knowledge of the technical standards and inspection and testing procedures, experience relevant to the work undertaken, and the correct appliance testing instrument, as stated in the Institution of Electrical Engineering (IEE) **Code of Practice for In-service Inspection and Testing of Electrical Equipment**.

It is not recommended that members of staff or volunteers carry out this procedure without formal training. Not only is a thorough grounding essential for safety's sake, but some types of business equipment like computers, screens or printers can also be damaged by inappropriate tests.

For some equipment the 'earth' is essential to safety. Therefore, all 'earthed' equipment, and most leads and plugs connected to equipment, should also have an occasional combined inspection and test to look for faults. This, together with a thorough visual inspection, can also detect faults such as

inadequate insulation or contamination of internal or external surfaces.

A combined inspection and test should also be carried out by the repairer after any repair to the equipment.

Always keep records of the results of all three types of testing and inspection procedures. Keeping records of how you manage health and safety risks is a legal requirement, and vital if an electrical accident occurs later, if there is a fire or if evidence is required in court.

3. How often should we check?

The frequency of inspection and testing required will vary depending on the type of appliance, its location and its use, and is based on what is 'reasonably practicable'. If the equipment is used in an environment where it is more prone to suffer damage, or if it is used by members of the public, then the testing should be done more often. For some equipment, such as children's rides, a daily check may be necessary to mitigate risks.

The IEE Code of Practice gives information on the frequency of inspection and testing of equipment, and suggests the following:

Equipment/environment	User checks	Formal visual inspection	Combined inspection and test
Battery operated	No	No	No
Extra low voltage equipment – e.g. telephones, low voltage desk lights	No	No	No
IT – e.g. desktop computers, screens	No	2-4 years	No, if double insulated – otherwise up to 4 years
Photocopiers, fax machines that are rarely moved	No	2-4 years	No, if double insulated – otherwise up to 4 years
Double insulated equipment that is moved occasionally – e.g. fans, lamps, projectors	Yes	2-4 years	No
Double insulated equipment that is hand held – e.g. some floor cleaners	Yes	6 months – 1 year	No
Earthed equipment – e.g. electric kettles, some floor cleaners	Yes	6 months – 1 year	1-2 years
Cables and plugs connected to the above, extension leads (mains voltage)	Yes	6 months – 4 years depending on equipment connected to	1-4 years depending on equipment connected to

Note: The information in this table is applicable to the UK only. For testing frequencies in the Republic of Ireland, refer to the **National Rules for Electrical Installation (ECTI)** – (see *Further Information & Resources* section). Advice on inspection and testing intervals in the UK is available in **Maintaining Portable and Transportable Electrical Equipment** (Health & Safety Executive) and the IEE Code of Practice.



B. Prevention is better than cure

There are many measures that can be taken, both in advance and on an ongoing basis, to minimise the risks from electrical equipment.

- The use of extension leads should be avoided where possible. If used, they should be tested as portable appliances. It is recommended that only 3-core leads (which include a third wire – the yellow and green ‘earth’) be used, as 2-core cables (which do not have the ‘earth’) do not provide protection against electric shock when used with some appliances.
- Ensure that all those working with electricity are competent to do so. Even simple tasks such as wiring a plug can lead to danger.
- Install new electrical equipment to a suitable standard (British Standards **7671 Requirements for Electrical Installations**/Electro-Technical Council of Ireland **National Rules for Electrical Installations**) and maintain it in good condition.
- Maintain existing equipment properly.
- Provide enough socket outlets – overloading socket outlets with adapters can cause fires.
- Choose equipment that is suitable for the working environment.
- Electrical risks can sometimes be eliminated by using air, hydraulic or hand-powered tools – although these carry their own element of risk.
- Provide an accessible and well-labelled switch near each fixed machine to cut off power in an emergency.
- For portable equipment, use socket-outlets which are close by so that equipment can be disconnected quickly in an emergency.
- Ensure that the ends of flexible cables are firmly clamped to prevent the wires pulling out of the terminals.
- Replace damaged sections of cable completely.
- Use proper connectors or cable couplers to join lengths of cable.

- Provide a safety device – if equipment operating at 230 volts or higher is used, an RCD (residual current device) can provide additional safety. This detects some (but not all) faults in the electrical system and rapidly switches off the supply.
- Provide fire-fighting equipment suitable for electrical fires, and ensure that your staff are trained to operate it.

Further Information & Resources

- **Health & Safety Executive** – www.hse.gov.uk
- **Health & Safety Executive Northern Ireland** – www.hseni.gov.uk
- **Health & Safety Authority** – www.has.ie
- **Electro-Technical Council of Ireland (ECTI)** – www.ecti.ie
- **Safety in electrical testing at work** – www.hse.gov.uk/pubns/indg354.pdf
- **Maintaining portable electrical equipment in offices and other low-risk environment** – www.hse.gov.uk/pubns/indg236.pdf
- **HSA 55 Memorandum of Guidance on the Electricity at Work Regulations (Northern Ireland) 1991**
- **The Management of Electrical Safety at Work** – ECTI. A training course based on this publication is also available from ECTI.
- **National Rules for Electrical Installations** Third Edition, 2004 – ECTI.
- **British Standards** – www.bsonline.bsi-global.com
- **The National Inspection Council for Electrical Installation Contracting (NICEIC)** is the UK’s consumer safety organisation and independent regulatory body for the electrical industry – www.niceic.org.uk
- **Register of Electrical Contractors of Ireland (RECI)** – www.reci.ie
- **The Electrical Contractors Safety and Standards Association (ECSSA)** – www.ecssa.ie
- **Association of British Theatre Technicians** – www.abtt.org.uk

Information contained here may go out of date and you are therefore advised to check its currency. Updated information may be available on the VAN website: www.voluntaryarts.org

Disclaimer: Reasonable precautions have been taken to ensure the information in this document is accurate. However, it is not intended to be legally comprehensive; it is designed to provide guidance in good faith at the stated date but without accepting liability. We therefore recommend you take appropriate professional advice before taking action on any of the matters covered herein.

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The Voluntary Arts Network is registered in Scotland as Company No. 139147 and Charity No. SC 020345.
VAN acknowledges funding from the Arts Councils of England, Northern Ireland, Scotland and Wales.