



## Health & Safety Electrical Portable Appliance Testing Policy

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<sup>1</sup> or earlier if change in legislation or on risk assessment

### Amendment Control

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## Policy Summary

The policy of Edinburgh Napier University is to provide and maintain safe and healthy working conditions, equipment and systems of work for all staff, students and others, and to provide such resources, information, training and supervision as needed for this purpose.

The University will provide resource and maintain appropriate management systems, systems of work and equipment to ensure that electrical risks to all staff, students and others associated with the use of portable electrical appliances are controlled.

The University will adopt the principles of control as set out in the Health & Safety at Work Act, the Management of Health & Safety at Work Regulations, the Electricity at Work Regulations, the Workplace (Health, Safety and Welfare) Regulations and the Provision and Use of Work Equipment Regulations.

The management of portable electrical appliances will be a continual commitment by the University and will involve regular monitoring and progress meetings, a risk assessment programme, monitoring, inspection and record keeping.

This policy is formally accepted by the University.

The University will do all that is reasonably practicable to comply with its requirements and will make the necessary resource available.

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## 1. Executive summary

The Electricity at Work Regulations are made under the Health & Safety at Work Act and require precautions to be taken to prevent death or personal injury from the use of electricity in work activities. The Regulations impose responsibilities on the employer and employees to conform to these regulations in every respect.

The inspection and testing of electrical equipment is an inherent part of compliance with the Regulations; therefore, The Institute of Electrical Engineers (IEE) have issued a Code of Practice for In-service Inspection and Testing of Electrical Equipment (IEE Code of Practice).

Edinburgh Napier University has a legal obligation to carry out, on a regular basis, electrical testing to all electrical equipment and installations. Such testing is a requirement of the Electricity at Work Regulations.

Since it is Edinburgh Napier University's policy to comply fully with such duties, all Deans of School and Directors of Service must ensure that the requirements of the Regulations are discharged, and that this policy on Electrical Portable Appliance Testing is incorporated into its local safety statements. It is the responsibility of the Deans of School and Directors of Service to ensure the testing of all Portable Appliances within their area is kept up to date and that equipment is made available when required to be tested. Arrangements for testing and recording of results will be managed by Property & Facilities.

The effectiveness of these arrangements will be risk assessment based and monitored periodically by Edinburgh Napier University's Health and Safety Team.

## 2. Legislation

Edinburgh Napier University undertakes to comply with the Electricity at Work Regulations made under the Health and Safety at Work Act, the Provision and Use of Work Equipment Regulations (PUWER) and all future statutory requirements concerned with the inspection and testing of portable electrical appliances.

This Policy covers the regular electrical checks, which will be carried out on electrical equipment to make it safe for students, staff and visitors and should be read in conjunction with the University Health and Safety Policy.

## 3. Definitions

### 3.1. Portable

There is no legal definition of portable equipment. However, in this [guidance](#)<sup>1</sup> it means equipment that is intended to be connected to a generator or a fixed installation by means of a flexible cable and

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<sup>1</sup> HSG 107


either a plug and socket or a spur box, or similar means. This includes equipment that is either hand-held or hand-operated while connected to the supply, intended to be moved while connected to the supply, or likely to be moved while connected to the supply. The electrical supply to the equipment is assumed to be at a voltage that can give a fatal electrical shock, i.e. more than 50 V ac or 120 V dc.

Extension leads, plugs and sockets and cord sets that supply portable equipment are classified as portable equipment because they operate in the same environment and are subject to the same use as the equipment they serve. This will apply to all our Campus Buildings, Sports facilities and at other locations such as BE-ST, Blantyre and RMP, 7 Hills.

### **3.2. Earthed equipment (Class I)**

This equipment relies on the metallic (exposed conducting) parts of the equipment being effectively earthed. If this earth connection is lost there is a possibility of the exterior of the equipment becoming live, with a potentially fatal result. Anyone touching live metal will be in contact with electricity.

### **3.3. Double insulated equipment (Class II)**

This equipment (which includes double insulated equipment marked) is constructed with high-integrity insulation and does not have nor need an earth connection to maintain safety. If you cannot see this symbol  you should assume that the electrical equipment is a Class I appliance.

### **3.4. Competent Person**

A Competent Person is a person who is employed or contracted by the University who has received suitable and sufficient training in Portable Electrical Appliance Inspection and Testing. The University will retain a list of trained competent persons employed by the University.

## **4. Responsibilities**

### **4.1. Property & Facilities**

- The Director of Property and Facilities is responsible for the provision of safe electrical supplies within the fabric of University buildings up to and including the outlet sockets.
- Beyond the electrical outlet, each School/Service is responsible for any further distribution of the supply and for all equipment connected thereto, unless the equipment is initially supplied and connected by Property & Facilities. (A supplementary convector heater would be one such example).
- Connections to the three-phase supply must only be carried out by Property & Facilities.
- Property & Facilities will manage a testing regime for all identified equipment on a rolling programme as per the frequencies detailed in Section 6.4 and are responsible for:

- Administration of the contract
  - Liaison between contractor and Deans of School/Directors of Service etc.
  - Maintaining the University asset register of equipment in conjunction with each School/Service
  - Maintaining a register of test results
  - Ensuring equipment that is deemed redundant, is disposed of in accordance with the University Waste Disposal Policy
- Maintenance Operations Manager will ensure that in-house PAT is only carried out by trained competent persons.

#### **4.2. Deans of School/Directors of Service**

Whilst every effort is made for this testing to be comprehensive, there is a responsibility on each Dean/Director to take appropriate measures to ensure that all electrical equipment is safe and suitable for the purpose intended and they are required to nominate a point of contact that Property & Facilities can liaise with on these matters. All relevant persons should be made aware of the associated hazards and of the requirements to adopt working procedures designed to keep the risks to their health, and to the health of other persons, as low as reasonably achievable.

The University Health and Safety Policy must be supplemented by local School/Service rules relating to the specific activities of the School/Service, so that when read in conjunction with this part of the Policy, the two documents form an effective means of securing the safe use of electrical equipment, written records of action taken will be maintained.

Deans/Directors shall be responsible for the following in relation to Portable Appliance testing:

- a) Ensuring adequate liaison with Property & Facilities for the inspection and testing regime
- b) Appointing a School/Service liaison person to deal with portable equipment
- c) Ensuring equipment and access is available for testing
- d) Informing Property & Facilities of new or redundant equipment
- e) Maintaining a School/Service asset register of equipment to be tested
- f) Ensure non-authorized equipment is not in use
- g) Ensure equipment that has failed PAT test is removed from service immediately by the competent person carrying out the testing

Where an item of equipment is purchased by a School/Service, they need to ensure that it is included on the central register and kept by Property & Facilities and that it meets all the electrical standards as detailed above.

Any portable appliances on hire or supplied for service lies with the Dean/Director hiring the equipment to ensure that the supplier tests and labels the equipment in accordance with University policy prior to the equipment being brought into service.

### **4.3. All users**

All users of portable equipment have a responsibility to carry out user checks prior to use and to report any faults to Property & Facilities and the Health & Safety Office. For home users, they must ensure that University portable equipment is regularly checked for electrical safety. If any faults are identified, or if anyone is in doubt about the electrical safety of their equipment, the equipment must be returned to the School or Service who issued it for checking/repair/replacement.

## **5. Portable equipment**

### **5.1. New equipment**

New equipment purchased within the EU and labelled with the CE mark can be deemed safe as the manufacturer will have tested the product to known safety standards. Any equipment which is purchased after 1st January 2022, must have either a UKCA or CE marking depending upon where and when it was manufactured, the manufacturer needs to demonstrate that it complies with the UK and EU product safety directives.

All equipment must be purchased through the University's approved procurement routes to ensure that it meets all electrical legal requirements. Note: equipment purchased via the internet does not always have the same safeguards and may require a visual check and electrical testing before use – see also section 13.4 of IET Code of Practice concerning fake and counterfeit equipment.

### **5.2. Second hand equipment**

Equipment purchased second hand must be safe to use and comply with European and UK legislation and standards governing the supply of electrical equipment. Schools/Services should ensure any second-hand equipment has undergone a combined inspection and test before it is put into service.

### **5.3. Hired/leased equipment**

Suppliers of hired/leased portable electrical equipment (including printers, photocopiers and vending machines) are responsible for formally inspecting and testing the equipment before each hire. Schools/Services should check the terms of the lease agreement regarding the responsibilities for ongoing inspection and testing of the equipment during the rental period and it should as a minimum meet the frequency of inspection and testing as detailed in Section 6.4. Dates of the latest inspection date should be recorded and monitored by each School/Service and recorded on our Asset Register as hired equipment.

### **5.4. Computers and laptops**

All our computers are relatively new and are unlikely to need to be electrically tested in their expected lifetime of 4-5 years. This is based not only on the risk of faults occurring, but also on the vulnerability of the equipment being damaged by the PAT test itself. During this period, it will be prudent to carry



out formal visual checks every 2-3 years (depending on the positioning of the cables and frequency of being unplugged). If feasible, the IEC (kettle type) lead can be tested separately from the computer to assure earth continuity to the equipment, and the integrity of the insulation of the lead.

Laptops fall within the same guidelines, but there is more priority put on the lead being inspected, this should be done annually if it is regularly used as a portable unit. Remember that there may be more than one lead per laptop. To reduce the risk, additional leads or docking stations can be supplied for home and office use reducing the likelihood for damage to power cables as they will remain in-situ.

## **5.5. Equipment from other organisations**

Where portable electrical equipment is loaned from other organisations, the lender must ensure equipment has been formally tested. Staff borrowing equipment from other organisations should request documented confirmation of the testing. Where this is not available, Schools/Services must make arrangements for the loaned equipment to be tested prior to it being used.

Under no circumstances should University equipment be loaned out to another organisation.

## **5.6. Personal electrical equipment**

Schools/Services should establish their own local arrangements for staff and students bringing personal electrical items into work and ensure these arrangements are communicated via the local rules. Larger personal electrical items used within the workplace must be within a current PAT period, as approved by the School/Service, and must be included in the overall Asset Register e.g. electric wheelchairs.

## **5.7. Staff equipment**

Personal equipment brought into the University to be used by staff must have the prior approval in writing of the Dean/Director - kettles, toasters, coffee machines, heaters etc. would not be permitted.

For home users, they must ensure that University portable equipment is regularly checked by the user for electrical safety. If any faults are identified, or if anyone is in doubt about the electrical safety of their equipment, the equipment must be returned to Information Services for checking / repair / replacement.

Each School/Service shall keep a register of ENU equipment that their staff have at home.

## **5.8. Student equipment**

Personal equipment brought into the University by students must have prior approval in writing of the Dean of School.

## 5.9. Residential accommodation

Equipment owned and supplied by Edinburgh Napier University as part of the lease agreement with the resident e.g. fridges, kettles etc. shall be tested in accordance with this University Electrical Portable Appliance Testing Policy.

Equipment owned by students and brought into the residences for their own use is the responsibility of the student. A Tenancy Agreement is in place that covers these aspects:

- a) 'where a Tenant brings portable electrical apparatus into the Premises they must ensure that all such equipment is in a good and thorough state of repair and in proper and safe working order'.
- b) 'nor shall anything be brought therein by the Tenant which increases the risk of fire'
- c) Also, as 'the Landlord will be entitled to request evidence from the Tenant that any portable electric appliances brought into the Premises by the Tenant are either less than one year old or failing such evidence [at the Landlord's option] require the Tenant to provide a Portable Appliance Testing Report (PAT) on such portable electrical appliances from a qualified electrical inspector. If required, the inspector should stick a label on each tested item which sets out the inspection date and each label should be signed by the inspector', and
- d) A Code of Conduct that needs to be signed for by the Tenant on compliance with Electrical Appliances in student accommodation.

## 5.10. European plug top adaptors

These are not permitted to be used on University premises, all equipment must have plugs fitted in compliance with BS 1363. Property & Facilities should be made aware of any such equipment and must be removed from use immediately.

# 6. Control methodology

## 6.1. Inspection and testing




### 6.1.1. User check

This is a simple visual check performed by the user of the equipment, or by someone giving equipment out to students. User checks are not recorded unless a defect is noticed. Section 7 of Health & Safety at Work Act puts a duty of care on employees to ensure the safety of all persons using the workplace. It is important that employees perform routine, simple safety checks. This includes checking the exterior of the plug, cable, socket outlet, etc. and making sure that cables are not trapped or trailing in a dangerous manner.

Any faulty, unsafe equipment needs to be disconnected and reported to the Property & Facilities Helpdesk (ext. 5000) immediately and the designated Health & Safety person for the School or Service.

All users of portable electrical equipment should carry out a 'user check' prior to operating the equipment. No formal training is required however, the checks should include the following.

A schedule of typical faults and photographs are shown below:

Component	Common fault to look for	Typical fault
<b>Mains Lead</b>	Cuts Cuts covered with tape Crushed Fraying Too long/short Taped joints Over stretched	
<b>Plug</b>	Is flex secured in gripper Shows signs of overheating Cracked casing Exposed or pulled cables out of plug	
<b>Socket outlet or mains lead outlet</b>	Shows signs of overheating Cracked casing	
<b>Appliance</b>	Does it work On/off switch functioning Cracked casing Chemical or corrosion damage to casing Damage resulting in access to live parts	
<b>Environment</b>	Suitability for the environment it will be used in	
<b>Job</b>	Suitability for the work to be undertaken	

### 6.1.2. Visual inspections

An important part of a maintenance regime is the visual inspection. Such inspections are necessary because they can reveal most potentially dangerous faults. They can normally be carried out by a member of staff who has sufficient information and knowledge of what to look for, what is acceptable, and who has been given the task of carrying out the inspection (that is, they are competent to do the task). To avoid danger, trained people should know when the limit of their knowledge and experience has been reached.

These inspections can help to control the risks and to monitor the user checks. A competent person should carry out regular inspections that include user checks similar to those previously undertaken in a more formal and systematic manner.

As part of the visual inspection, you should also consider whether:

- a) The electrical equipment is being used in accordance with the manufacturer’s instructions.
- b) The equipment is suitable for the job.
- c) There has been any change of circumstances.
- d) The user has reported any issues.


Additional checks could include removing the plug cover to ensure:

- a) There are no signs of internal damage, overheating or water damage to the plug.
- b) The correct fuse is in use, and it is a proper fuse, not a piece of wire, nail etc.
- c) The wires including the earth, where fitted, are attached to the correct terminals.
- d) The terminal screws are tight.
- e) The cord grip is holding the outer part (sheath) of the cable tightly; and no bare wire is visible other than at the terminals.

### 6.1.3. Combined formal visual inspection and testing ('PAT Testing')

Since over 80% of electrical faults are discovered by visual inspection it is University Policy that the formal visual inspection is carried out by a competent person as part of the combined test. Where Schools or Services nominate a designated competent person to undertake this activity, they will be trained accordingly. Details on the training required can be obtained from the Health & Safety Office.

Formal visual inspection involves a lot more work than simple user checks and includes procedures such as dismantling plugs to check connections, fuses, etc., looking for signs of overheating, checking cable runs to make sure that they do not have heavy equipment placed on top of them, making sure that items such as filing cabinets are not blocking access to the socket, plug and switch, etc. The following schedule is recommended.

Plug	Mains Lead	Appliance
<ul style="list-style-type: none"> <li>• Cracked casing</li> <li>• Bent pins</li> <li>• Incorrectly rated fuse</li> <li>• Incorrectly connected wires</li> <li>• Loose connections</li> <li>• Loose cable clamp</li> </ul>	<ul style="list-style-type: none"> <li>• Cuts, fraying, brittle</li> <li>• Kinked, coiled</li> <li>• Taped joints</li> <li>• Overloaded (overheated)</li> <li>• Male connector (if fitted)</li> <li>• Non-standard (IEC 320, BS4491, CEE22)</li> <li>• Not secured by grommet/clamp on appliance</li> <li>• Damaged cable covered with tape</li> </ul>	<ul style="list-style-type: none"> <li>• Suitability for the environment or work being undertaken</li> <li>• Damage/faulty operation of off/on switch</li> <li>• Damage to casing</li> <li>• Loose parts</li> <li>• Missing screws</li> <li>• Evidence of overheating</li> <li>• Evidence of moisture</li> <li>• Missing double insulation mark  on insulating casing (where appropriate)</li> </ul>

Plug	Mains Lead	Appliance
		<ul style="list-style-type: none"> <li>• Accessible fuse holders: damage or removal of carrier permits live part to be touched</li> <li>• Exposed output connections have marked voltage rating &gt; 50V</li> </ul>

In addition to formal visual inspection, specialised electrical test instruments are used (usually a dedicated portable appliance tester) to test for things such as earth bonding, insulation strength, touch current, leakage current, substitute leakage current and functional (running) tests. Specific training will be required for using such equipment. It is important that the person performing the tests understands the test results and that *formal recordings are taken for each test, even where no faults are found*. It is suggested that combined formal visual inspection and testing ('PAT Testing') will be carried out in accordance with Clause 6.4.

The important thing to remember is that, by law, the electrical equipment in the workplace has to be, in simple terms, '**safe, well-maintained and suitable for the purpose for which it is being used**', and at all times. Again: whilst formal visual inspection and testing (PAT Testing) will help to determine whether the equipment meets these criteria (at the time of testing), these procedures will not, in themselves, keep the University compliant with the law; the law requires that the equipment, at all times, must be safe, well-maintained and suitable for the purpose for which it is being used. For example, if an item is inspected and tested and is shown to be safe but, however, becomes electrically unsafe a few months later, then it is illegal to have this item in commission, reinforcing the importance of regular visual as well as documented inspections.

Finally, it is important to point out that the frequency of inspection and testing must be kept under review, especially when factors such as the environment or frequency of use etc. change. The last period of testing undertaken within the university proved that there was a very low failure rate of equipment which has influenced the decisions on ongoing testing frequency.

## 6.2. Schedule of inspection and testing

The following schedule is recommended, carried out in the order as written (greater detail is provided in the IET: Code of Practice for In-Service Inspection and Testing of Electrical Equipment, including pass/fail criteria).

### 6.2.1. Class I appliances

#### ***Earth Continuity / Bonding Test***

This test is for checking the earth lead continuity and earth connection (or bonding) to the metal casing of an appliance is sound.

#### ***Insulation Test***

This test checks the integrity of the appliance's insulation. For Class I appliances the test voltage is applied between the appliance's mains supply plug P (phase) and N (neutral) pins connected together, and the E (earth) pin which is held at earth potential

### ***Earth Leakage Test***

This test shows the level of leakage current in the appliance by monitoring the difference in currents flowing in the phase and neutral connections; any difference must be flowing to earth. This provides a useful way of predicting approach of appliance breakdown since the level of leakage current is a guide to the condition of insulation. Since many appliances are designed with earth leakage, this test is not mandatory; faults are indicated in the Insulation Test described above.

### ***Operation V/A Test (optional)***

This test indicates that the appliance is in good working order and not drawing excessive current.

## **6.2.2. Class II appliances**

Test as for Class I Appliances, except with the omission of the Earth Continuity / Bonding Test.

## **6.2.3. Very Sensitive Electronic Equipment**

Earth Continuity / Bonding Test ONLY – **PAT device not to be used**. Using a **multi-meter** able to read to 300 milli Ohm, the resistance between the earth pin and any exposed metal (Not signal sockets) should be less than 300 milli Ohm.

## **6.2.4. Three Phase Equipment**

The inspection and testing of three phase equipment is a specialist task which must be carried out, either:

- under service contract
- by Property & Facilities

## **6.2.5. Extension leads**

These should be tested by connecting, in turn, to each of the sockets an electrical appliance that has already been shown to be electrically safe, and then performing the usual electrical tests (depending on whether the extension lead and appliance are Class I or Class II). Extension leads should never be 'daisy chained' (e.g. extension leads connected to another extension lead).

## **6.2.6. Power leads**

These should be tested by being connected to an electrical appliance that has already been shown to be electrically safe, and then performing the usual electrical tests (depending on whether the extension lead and appliance are Class I or Class II).

### 6.3. Testing equipment

A commercially available Portable Appliance Tester (PAT) is used for electrical testing of robust appliances. Some PATs have a facility for testing 110V equipment. All University PATs must be calibrated annually and records kept.

**A portable appliance tester should not be used** on very sensitive electronic equipment, as permanent damage may be caused by the high-test voltages and currents. All such sensitive electronic equipment must be clearly marked to prevent inadvertent testing.

### 6.4. Categories of Equipment and Frequency of Inspection and Testing

Portable appliances shall be inspected prior to being put in to use within the University and thereafter the frequency of inspection and testing will be carried out in accordance with the timescales detailed in table 1 below. The University will continually risk assess the following factors (the environment, the users, the construction of the equipment and how the equipment is used) to determine whether the frequency intervals need to be changed.

**Table 1: Categories of Equipment and Frequency of Inspection and Testing**

Equipment / Environment		Examples	User Checks	Formal Visual Inspection	Combined Inspection and Testing
Battery-Operated: (less than 40 volts)		Cordless garden equipment, mobile phone / iPad / tablet charging equipment	No	No	No
Extra low voltage: (less than 50 volts AC):		Telephone equipment, low-voltage desk-lights			
Double insulated equipment (Class II)	<b>Category 1: Hand-held. Portable equipment</b> , which is held in the hand while in use	Electric drills, portable saws, soldering irons, inspection lamps, vacuum cleaners, floor polishers, kettles, toasters	Yes	Yes, 6 months - 1 year	No
	<b>Category 2: Not hand-held Portable equipment</b> used in fixed positions but moved occasionally during use, or which is used in wet or hazardous locations	Desk fan, table lamps, laboratory bench top equipment, electric heaters, kitchen equipment, mixers, slicers, etc.	No	2 - 4 years	No
<b>Category 3: IT Equipment</b> (rarely moved and not hand-held in use or less hazardous items, this includes ENU own equipment for use at home)		Desktop terminals, printers and PCs, photocopiers, calculators, fax and telephone answering machines, TV and radio receivers and other video and audio equipment	No	Yes, 2 - 4 years	No if double insulated, otherwise up to 5 years
Earthed equipment (Class I)		Electric kettle, some floor cleaners and power tools, irons	Yes	Yes, 6 months - 1 year	Yes, 1 - 2 years
Cables (leads and plugs connected to any of the above equipment), and mains voltage extension leads and battery charging equipment should be maintained as part of the that equipment.			Yes	Yes, 6 months - 4 years, depending on use and type of equipment it is connected to	Yes, 1 - 5 years depending on use and type of equipment it is connected to

**Notes for Table**

1. Cables, leads and plugs not dedicated to an item of equipment should be maintained as individual items as appropriate.
2. The examples given above are not intended to be an exhaustive list but are illustrative of the type of equipment concerned. If there is any doubt as to which category an item of equipment not specified above lies in, please contact Property & Facilities for clarification.
3. Class I – one layer of insulation, Class II – two layers of insulation

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## 6.5. Recording of Inspection and Testing Results

### 6.5.1. Test results

The Electricity at Work Regulations require that the results of electrical safety tests are recorded. Results must be kept of all inspection and test results and recorded on the University asset inventory system. These results will be retained by Property & Facilities so that they are easily accessible for the future. These results can either be paper records or computer records.

A dated test label must be affixed to the appliance (and to the plug if the lead is detachable). The label should show the following:

- a) PASS or FAIL
- b) Test given (e.g. Combined Inspection and Test)
- c) Unique identification for the equipment (e.g. School/Service inventory number)
- d) A "do not use after 'date'" warning or the "last test 'date'"

Note: No Combined Test is required provided the new equipment is purchased from a reliable source and new equipment is visually inspected for signs of obvious damage. New equipment will be tested during the next round of PAT testing at a frequency determined depending on the use/environment etc. it will be marked accordingly of the date of next test.

### 6.5.2. Equipment failure

Equipment, which fails the test, shall be:

- a) Clearly labelled with a FAIL label
- b) Cable or plug removed to ensure it cannot be used
- c) Removed from area and service immediately by the Competent Person/School/Service
- d) Shall not be put back into service until fault rectified and retested
- e) Equipment is deemed redundant and disposed of by the Competent Person in accordance with the University Waste Disposal Policy
- f) Details removed from the Asset list and any associated paperwork updated

**All "failed" equipment must be removed immediately for repair or disposal.**

## 7. Monitoring compliance

Any management system, if left alone, will deteriorate over time. The Health & Safety Office will periodically monitor that this statement remains relevant and effective.

## **8. Guidance notes**

### **8.1. General**

Nearly a quarter of all reportable electrical accidents involve portable equipment. The majority of these accidents result in electric shock; others result in fires. A major cause of such accidents is failure to maintain the equipment. The likelihood of accidents occurring and their severity will vary depending on the type of electrical equipment, the way in which it is used, and the environment in which it is used.

Under no circumstances should a person use electrical apparatus if they have any doubts as to its safety. If in doubt they should consult their Supervisor, Tutor or School/Service Safety Co-ordinator as appropriate or the Health & Safety Office directly.

Specialised appliances frequently require special precautions to be taken and reference should always be made to the manufacturer's instructions.

If any person has concerns about the safety of connections to the electrical supply, Property & Facilities will give advice. Flexible leads should not be clipped to walls to form quasi-permanent extensions to the electrical installation. Where Schools/Services wish to extend the fixed wiring system within the University building, this must be done by or in consultation with Property & Facilities.

If any doubt exists about the safety of a piece of electrical equipment, it must be taken out of service immediately and labelled 'Not for Use'. It should be removed immediately from the area concerned and repaired or disposed of safely. If any dangerous equipment is found, this must be recorded as a near miss on the Health & Safety accident form and Property & Facilities central records updated.

### **8.2. Assessment of risk**

#### **8.2.1. High risks**

High risks would result from the use of an electrically powered pressure water cleaner outside, powered by 240 volt electrical supply, with the cable trailing on the ground, where it can be damaged by vehicles and other equipment, and where water is present. Damage to the cable or other parts is likely to result in the operator or others receiving an electric shock. Similar risks result when other electrical equipment such as drills and portable grinders are used in harsh environments or where cables could be run over by forklifts, vehicles, etc. e.g. construction sites, workshops and labs where there is a high probability of mechanical damage resulting in danger.

#### **8.2.2. Medium risks**

Medium risks would result from floor cleaners or kettles which are usually used in a more benign environment, e.g. offices but can be subject to intensive use and wear. This can eventually lead to faults which can also result in a shock, burns or fire.

### **8.2.3. Low risks**

Specialised equipment, e.g. information technology (IT) equipment (computers and printers), photocopiers, fax machines etc. are considered low risk; they are usually double insulated, are used in dry clean environments and are infrequently moved or stressed.

### **8.2.4. Other factors to consider**

Equipment which is held by hand or is handled when switched on will present a greater degree of risk because, if a dangerous fault occurs, then the person holding it will almost certainly receive an electric shock.

The risk of receiving an electric shock will be greater when the equipment user is standing on the ground outside or a concrete floor, scaffolding or similar which is a good conductor, than if standing on a wooden floor or dry carpet and not in contact with earthed metal work (i.e. using double insulated appliances or 110-volt tools which have a centre tapped transformer to give 55 volts between live and earth).

Because the consequences of an accident are so serious - potentially fatal electric shock, or fire affecting the whole premises - the inspecting and testing system is designed to be proactive, i.e. planned to prevent incidents arising, rather than reactive where action is taken following an incident/accident. The frequency of inspection and testing is directly related to risk.

The greatest overall reduction of risk will take place when the inspection and testing regime is first put into practice. Thereafter it will take time to establish the appropriate test frequency based on experience. A low failure rate would indicate that the test interval can be increased and a high failure rate that the interval should be shortened.

## **8.3. Further guidance**

The Institution of Electrical Engineers publish the "Code of Practice for In-service Inspection and Testing of Electrical Equipment" ([ISBN: 978-1-78561-966-3 paperback](https://www.electrical-engineering.com/ISBN-978-1-78561-966-3-paperback)).