## The safe use and management of transportable and portable electrical appliances

<table>
<thead>
<tr>
<th>Scope</th>
<th>This Standard details the process for ensuring the safe use of portable and transportable electrical appliances commonly used in the University by staff, students and contractors. This document does not include the use of portable and transportable electrical appliances on construction sites or the maintenance and inspection of fixed electrical equipment.</th>
</tr>
</thead>
</table>
| Law | Electrical Equipment (Safety) Regulations 1994  
Supply of Machinery (Safety) (Amendment) Regulations 1994  
Provision and Use of Work Equipment Regulations 1998  
Management of Health and Safety at Work Regulations 1999 |
| Related H&S Standards |  |
| Training/information/instruction required | General risk assessment  
Portable appliance testing (if part of duties)  
The visual inspection of portable and transportable appliances |
| Additional sources of information |  |
Introduction

1. Portable and transportable electrical appliances are used by every member of staff, student, visitor and contractor at some time. The University has a duty to prevent, as far as is reasonably practicable, danger to staff, students, visitors, contractors and anyone else using our sites. To fulfil this duty we must ensure electrical equipment is fit for purpose, being used for the intended purpose and in good condition. Manufacturers and suppliers also have a duty to ensure the safety of equipment they supply.

2. The type of electrical equipment and the way it is used has a direct impact on the likelihood of damage. Testing, maintenance and inspection regimes should reflect the likelihood of damage to equipment and this should be identified by a risk assessment. A ‘one size fits all’ approach to ensuring electrical equipment is safe to use is not appropriate and is likely to result in considerable waste of time, effort and money. The following guidance reflects the Health and Safety Executive’s guidance ‘Maintaining portable and transportable electrical equipment – HSG 107’ and will enable you to identify an appropriate testing, inspection and maintenance regime for your equipment.

3. A register of all portable electrical equipment should be maintained. It is usually most practical to maintain this register at a departmental level, a College or School register is likely to be difficult to maintain and keep up to date. Each piece of equipment should be uniquely identifiable and records kept of all formal visual inspections and appliance tests and should include details of any damage and repairs.

Definitions

4. **Portable/transportable**

Equipment that is not part of a fixed electrical installation but is intended to be connected to a fixed installation or generator by means of a flexible cable and either a plug and socket, a spur box or similar means. This includes equipment that is 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 50V ac or 120V dc.

5. **Class I**

Electrical equipment that relies on the metallic (exposed conducting) parts of the equipment being effectively earthed. If the earth connection is lost there is the possibility of the exterior of the equipment becoming live. Under these circumstances anyone coming into contact with live metal will be in contact with electricity and is likely to receive an electric shock that could be fatal.

6. **Class II**

Electrical equipment constructed with high integrity insulation and does not have or need an earth connection in order to maintain safety. Includes double insulated equipment marked □

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1 For the purposes of this document portable will be used to mean both portable and transportable.
Source of equipment.

7. Most portable electrical equipment used in the University has been provided by the University either as part of an office fit out, course equipment or work shop equipment. Some equipment will be bought in by contractors and some by students and visitors. All equipment must be in a safe condition and used for the intended purpose in the intended environment.

8. Any electrical equipment bought on to site should be inspected for safety; with the exception of laptops, tablets, net books and their chargers, or phone chargers. The minimum inspection should be a basic visual inspection. If necessary a more thorough visual inspection or portable appliance testing should be carried out. All inspections and testing must be completed by a competent person and records kept. No unsafe electrical equipment is to be allowed onto University premises. Any equipment from a hire company should have been tested/inspected by the hire company before it is hired out and accompanied by written verification. Table 1 provides guidance of the type and frequency of testing and inspection university equipment should be subject to.

Use of equipment

High  Hand held equipment that is used whilst plugged into the power source and used in areas where it may be damaged or used in such a way as to make it more likely to be damaged, this is particularly the case when equipment is used outside.

Medium Hand held equipment used whilst plugged into the power source but, not likely to be damaged.

Low  Battery operated equipment and office type equipment such as computers and photocopiers that are mains operated but not hand held when operating.

9. Equipment that is hand held or handled when switched on i.e. an iron or mains operated drill presents a greater degree of risk because if it does develop a dangerous fault the person holding it will almost certainly receive an electric shock.

10. Electrical equipment is constructed to be used in certain environments and should never be used in an environment in which it is not designed to be safe. All electrical equipment will be marked to indicate the environments in which it is safe to use. This information should be available for all new equipment and should be taken into account when completing the risk assessment to ensure that the equipment is safe to.

Use of single and multi plug extension leads

11. The use of extension leads should be kept to a minimum. Cube adapters must never be used and should always be removed if found. If the fixed electrical circuits in a room are inadequate for the activity in that room they should be modified rather than rely on extension leads. If the use of an extension lead is required to meet short term needs the following factors must be considered:

Written by:
- Extension leads should be fused.
- Extension leads should be either switched or have a visual indication if they are live.
  - If it is not easy to turn the supply of at the wall socket to which the extension lead is attached the extension lead must have an on/off switch, preferably one for each socket in a multi-gang extension lead.
  - If it is easy to turn the supply off at the wall socket the extension lead should have a visual indicator that it is live or dead. This is usually a light.
- Equipment should be suitable for the environment in which it is to be used and the amount of damage likely to be sustained.
- All equipment, including extension leads, lent out to staff or students from central equipment stores should be subject to a visual inspection when returned, or before being lent. Records should be kept, each piece of equipment should have a unique identifier.
- Extension leads that are likely to be damaged should be tested at no less than three month intervals and, if used outside in circumstance likely to result in mechanical damage, no less than monthly.
- Extension leads must not be overloaded and must not overload the wall socket.
- The shortest extension lead, with the minimum number of additional sockets required, should be used. Cable drum extension leads must be fully extended when in use. If not there is a risk they will overheat and cause a fire.
- Extension leads must never be daisy chained i.e. one extension lead must never be plugged into another to provide additional sockets or length.

**Maintenance**

12. As with all work equipment electrical equipment must be subject to routine maintenance to ensure it remains in good working order. Any defects should be identified in a timely manner and the equipment taken out of use until repaired or replaced. A good initial level of safety can be achieved by correct selection and use of equipment.

13. Lasting safety can only be ensured by ongoing and effective maintenance and responsible usage. Users should treat equipment reasonably, only use equipment for its intended purpose and report any damage, defects or failures to the responsible person i.e. a technician in a workshop, academic member of staff or member of staff working in the central store. The first level of maintenance of portable electrical appliances is a visual inspection by all users before use. Appendix 1 is a visual reminder of the most obvious and common causes of damage that should be checked for in a visual inspection.

14. Maintenance can include visual inspection, testing, repair and replacement. Not all equipment requires portable appliance testing but all should be subject to some form of visual inspection. There are three parts to effective maintenance, some or all of which may be suitable for a particular piece of equipment, frequencies are determined by usage and likelihood of damage and the inherent risk of the equipment.
User checks (visual)

15. People using equipment should be encouraged to check it visually to check for signs that it may not be in a sound, safe condition. These checks should be included in student inductions and reminders placed in workshops with visual-aide memoirs to remind students and staff of what to look for (appendix 1).

16. All users should be instructed to report any defects and not use damaged equipment.

17. If it is not appropriate to rely on users to visually check equipment before use visual checks should be carried out by the supervising member of staff every day (or before equipment is likely to be used if this is less frequently than daily). In this circumstance records should be kept that visual inspections have been completed.

18. If equipment has been leased the leasing company should ensure the equipment is in a safe condition before supplying it, however visual inspections should still be undertaken before use.

What to look for

- Damage (apart from light scuffing) to the cable sheath.
- Damage to the plug, for example if the casing is cracked or the pins bent or missing.
- Inadequate joints, including taped joints in the cable.
- The outer sheath of the cable is not effectively secured where it enters the plug or equipment. Obvious evidence is if the coloured insulation of the internal cables are showing.
- Equipment has been used in conditions for which it is not suitable i.e. wet or very dusty conditions.
- The equipment is dirty or dusty.
- Damage to the external casing of the equipment, loose parts or screws.
- Evidence that there has been overheating i.e. burn marks or discolouration.

The checks should apply to extension leads and all associated plugs and sockets.

19. Equipment that is found to be faulty must be taken out of use and clearly labelled as faulty. It should not be put back into use unless repaired by a competent person. If it is not possible or economic to repair it must be disposed of through the appropriate waste stream, contact the Facilities team for details and to make arrangements.

20. If equipment found to be faulty is not owned by the University i.e. belongs to a student, visitor or contractor, then it must not be allowed on site and the reason for failing the visual inspection explained to the owner. A record should be kept of the reason why the equipment failed inspection and that the article was returned.

Formal visual inspection

21. This is considered to be the most important component of a maintenance regime by the HSE and should be carried out routinely by a competent person. Formal visual inspections can pick up most potentially dangerous faults. The maintenance regime should always include this component. See below for details.

22. To control risks and monitor the effectiveness of user checks a competent person should carry out regular inspections that include the user checks detailed above with the additional checks
listed below. These checks should be carried out regularly, be systematic and formally documented. The frequency of formal visual inspections should be determined by risk assessment taking into account the equipment, usage and environment in which equipment is used. Equipment manuals may provide guidance on inspections and maintenance regimes. (Table 1 provides guidance on frequency of all inspections and testing)

- Ensure the correct fuse is being used. This may require the plug cover to be removed.
- Check the cord grip is effective and the cord is held firmly in place.
- Check the cable terminations are secure and correct, including an earth where appropriate.
- There are no signs of internal damage, overheating or ingress of liquid or foreign matter in the plug.

The formal inspection should not include taking the equipment apart (with the exception of the plug, when appropriate, see above)

Who can carry out formal visual inspections?

- Usually a member of staff who has sufficient information and knowledge of what to look for and what is an acceptable condition. Should be someone who has been given the task as part of their work duties.
- The decision of the person tasked with carrying out formal visual inspections to fail a piece of equipment should not be second guessed; further inspections or testing may be carried out by a competent person. If a piece of equipment has been found to be unsafe it must be taken out of use until such time as it is repaired or found safe to use.
- The person must be aware of the limits of their knowledge, to be able to identify when a piece of equipment is not safe to use and should be subject to further tests, taken out of use, repaired or replaced. Additional training may be necessary.

Portable Appliance Testing

- Portable appliance testing (PAT) is the term used to describe the examination of electrical appliances and equipment to ensure they are safe to use. Most electrical safety defects can be found by visual examination but some types of defect can only be found by testing.
- Portable appliance testing usually includes basic safety checks; an earth continuity test, insulation resistance test and the ability to check the wiring of detachable mains cords. They are usually pass and fails and unable to diagnose the cause of a problem or suggest repairs. They should always be done in conjunction with a formal visual inspection.
- PAT does not need to be carried out by a qualified electrician however the person carrying out the tests must be competent to do so having completed training enabling them to use the test equipment properly and understand the test results. They must also have the correct equipment to carry out the tests.
- Portable Appliance testing can be arranged through the Facilities Department but can also be managed locally if this is a more practical solution, which is likely for equipment requiring more than annual tests, equipment loaned out by a central equipment store for example.
Table 1 Combined inspection and tests

<table>
<thead>
<tr>
<th>Equipment / usage</th>
<th>User checks</th>
<th>Formal visual inspection</th>
<th>Combined test and inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment hire</td>
<td>Instructions on appropriate user checks to accompany equipment and be explained to lendee at time of loan</td>
<td>Before issue/ after return</td>
<td>Before issue</td>
</tr>
<tr>
<td>Equipment from a College loan store.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High risk of equipment damage, equipment used off site.</td>
<td>Daily, or before use if used less than daily.</td>
<td>Weekly</td>
<td>6 monthly</td>
</tr>
<tr>
<td>Workshop equipment that is moved around and/or subject to mechanical damage i.e. domestic irons</td>
<td>Daily, or before use if less frequently than daily</td>
<td>Termly</td>
<td>12 monthly</td>
</tr>
<tr>
<td>Office information technology e.g. desktop computers, photocopiers, fax machines</td>
<td>Generally only necessary after an office move, visual checks to be carried out by the person setting up the desk/re-attaching equipment</td>
<td>1-2 years Unless an accident or near miss indicates a problem with a particular piece of equipment or layout.</td>
<td>None if double insulated, otherwise 3-5 years depending on movement of equipment.</td>
</tr>
<tr>
<td>Double insulated equipment not hand-held e.g. fans and table lamps</td>
<td>No</td>
<td>2-3 years</td>
<td>No</td>
</tr>
<tr>
<td>Hand held double insulated (Class II) equipment e.g. some floor cleaners, kitchen equipment</td>
<td>Yes</td>
<td>Termly if heavily used 6 monthly is used occasionally</td>
<td>No</td>
</tr>
<tr>
<td>Earthed (Class I) equipment e.g. electric kettles, some floor cleaners</td>
<td>Yes</td>
<td>6 months in areas where heavily used by lots of staff and students.</td>
<td>Annually for heavily used equipment Bi-annually for other situations</td>
</tr>
<tr>
<td>Cables, plugs and extension leads (not in areas of heavy use or likely to be subject to mechanical damage, see above)</td>
<td>Yes</td>
<td>1 year</td>
<td>2 years</td>
</tr>
</tbody>
</table>
User checks for electrical appliances.

Check out equipment and tools every time you use it

Never use faulty or damaged equipment

Ensure the plug is not damaged. There should be no cracks or bits missing, all screws and fastenings should be in place and working.

Check the no part of the cable, sockets or plugs have been repaired with tape or any type of connector.

Check the cable is in good condition with no wires showing and the outer layer in one piece.

Check the outer cover of the equipment is not damaged in a way that will give rise to an electrical or mechanical hazard.

Ensure the cable is correctly secured in the plug with no internal wires visible.

Never wire more than one appliance into a plug.

Do not overload extension leads. Only use extension leads if there is no other option.

Hint: All of these pictures show wrong conditions.

If equipment is broken give it to:

They will arrange for repair or disposal.

Never leave faulty equipment for someone else to use.