

## Health and Safety

# Fact sheet

## Number 08

Issue 05/13

### Portable electrical appliances - inspection and testing

Portable electrical appliances are generally classed as equipment that has a lead (cable) and plug. Equipment includes: -

- Computers.
- Tools.
- Portable heaters.
- Lamps.
- Mobile phone chargers.
- Power cables for laptops.
- Extension leads.
- Residual current devices (RCDs).
- Floor cleaners.
- Kettles.
- Electrically powered cement mixers.
- Photocopiers.

Injuries from using electrical equipment include: -

- Electric shock.
- Electrical burns.
- Loss of muscle control.
- Thermal burns.

- Secondary injuries from fire or falling, e.g. being jolted away by the electricity.

The Electricity at Work Regulations require “all systems to be maintained, so far as is reasonably practicable, to prevent danger”. This requirement includes all items of electrical equipment. There are no legally defined procedures for maintaining equipment, only industry guidance.

Although manufacturers and suppliers of electrical equipment have legal duties to supply safe equipment, including suitable protection against electrical hazards, employers should have proven systems for maintaining portable appliances. The type and frequency of equipment inspection and maintenance should be based on risk assessment and manufacturer’s recommendations. The level of inspection and maintenance for equipment in a high-risk environment, e.g. construction will be more stringent than for a low risk environment such as an office. However, even in a low risk environment electrical equipment can still cause serious injuries.

## **INSPECTIONS**

Industry guidance recommends three levels of inspections for portable electrical equipment: -

### **1. User checks**

Users of portable appliances should be encouraged to visually inspect the equipment before and during use, checking for the following: -

- Damage to cables, e.g. cuts, abrasions and to the electrical equipment itself.
- Damage to the plug, e.g. cracking, bent pins.
- Cable sheath or wires, e.g. not fully secure within the plug.
- Signs of overheating, e.g. burn marks or discolouration.
- Ensuring suitable environment for use, e.g. avoiding wet or contaminative conditions.
- Loose screws or casing.

### **2. Formal visual inspections**

As part of a maintenance system, a trained person should regularly undertake a formal visual inspection of the equipment to check for potentially dangerous conditions. A trained person can include someone that has been provided with sufficient information and knowledge to know what to look for and what is acceptable.

The aspects covered in (1.) above should be included under this section. In addition, the following should be inspected: -

- Plugs, excluding moulded plugs, should be removed to ensure the correct fuse is being used and fitted correctly.
- The cord is secure within the plug.
- The wire terminals are tight and correctly connected.

The equipment itself is not required to be dismantled for this level of inspection.

The frequency of formal inspections depends on the type and age of the equipment, the environment in which it is used and the frequency of use. The manufacturer may assist in deciding the frequency of inspections but the employer should also consider past history or faults found with the equipment. It is recommended records be kept of formal visual inspections undertaken.

### 3. Combined inspection and testing

This level of inspection normally requires a greater degree of competence than in parts (1.) or (2.) above, by someone with more electrical knowledge. The inspections undertaken in (2.) should be undertaken as part of this combined inspection and testing. Consideration should also be given to dismantling and inspection of the electrical equipment.

Testing of portable electrical equipment is also recommended. Testing is sub-divided into two types and each one requires a different standard of competence.

Type 1: A pass/fail portable appliance testing, PAT kit which is used by a trained person (not necessarily skilled in electrical work) following documented procedures.

Type 2: Specialist testing equipment is readily available in the market that can provide more detailed information about the condition of an electrical item. A competent person with electrical skills who is able to interpret the test results should only use this equipment. This level of testing is undertaken less frequently if the other inspection criteria described above i.e. (1.) or (2.) are performed.

The tables below provide guidance on the level of inspections that can be performed for certain types of portable electrical equipment. Where equipment is used in demanding environments or where the environment is likely to be poor, the periods recommended between inspections should be reduced. In addition, if the equipment is thought to be faulty, damaged or contaminated then testing should be carried out. The manufacturer or employer's trade association could also provide advice on the level and frequency of inspection and testing. Guidance provided by the HSE and trade associations vary slightly but the following tables are a starting point for inspection and testing and over time, analysis of the results may allow refinement of practices.

Documented records of results of inspection and testing should be kept. These records can be useful in monitoring and reviewing the effectiveness of the maintenance scheme. The records can also be useful as an inventory of electrical equipment.

**TABLE 1** – Suggested inspection intervals for portable electrical appliances used in low risk environments, e.g. offices.

Item	User checks	Formal visual inspection	Combined inspection and tests
Battery operated (less than 40 volts)	No	No	No
Extra low voltage (less than 50 volts AC), e.g. telephone equipment, low voltage desk lights	No	No	No
Information technology, e.g. desktop computers, VDU screens	No	Yes, 2-4 years	No if double insulated, otherwise up to 5 years
Photocopiers, fax machines ( <i>not</i> hand held – which are rarely moved)	No	Yes, 2-4 years	No if double insulated, otherwise up to 5 years
Double insulated equipment (Class II) <i>Not</i> hand held – which <i>is</i> moved occasionally, e.g. fans, slide projectors	No	Yes, 2-4 years	No
Double insulated equipment – (Class II) which <i>is</i> hand held, e.g. some kitchen equipment, and some floor cleaners	Yes	Yes, 6 months – 1 year	No
Earthed equipment (Class I), e.g.	Yes	Yes, 6 months – 1 year	Yes, 1-2 years

electric kettles, some floor cleaners, irons and some kitchen equipment			
Equipment used by the public, e.g. in hotels	By member of staff	Yes, 3 months	Yes, 1 year
Cables (leads) and plugs connected to the above, extension leads (mains voltage)	Yes	Yes, 6 months – 4 years depending on the type of equipment it is connected to	Yes, 1 – 5 years depending on the type of equipment it is connected to

**TABLE 2 –** Suggested inspection intervals for portable electrical appliances used in higher risk environments, e.g. construction sites.

Item	User check	Formal visual inspection	Combined inspection and test
Equipment hire	N/A	Before issue/after use	Before issue
Light industrial	Yes	Before initial use then 6 monthly	6-12 months
Heavy industrial/ high risk of equipment damage	Daily	Yes, weekly	6-12 months
Construction - indication only but see table (below) for more detail	110v weekly  230v daily/every shift	110v monthly  230v weekly	110v before use on site then 3 monthly  230v mains before first use on site then monthly

Equipment/application	Voltage	User check	Formal visual inspection	Combined inspection and test
Battery operated power tools and torches	less than 25v	No	No	No
25v portable hand lamps (confined or damp situations)	25v secondary winding from transformer	No	No	No
50v portable hand lamps	Secondary winding centre tapped to earth (25v)	No	No	Yearly
110v portable and hand held tools, extension leads, site lighting, moveable wiring systems and associated switchgear	Secondary winding centre tapped to earth (55v)	Weekly	Monthly	Before first use on site then 3 monthly
230v portable and hand held tools, extension leads and portable floodlighting	230v mains supply through 30mA RCD	Daily/every shift	Weekly	Before first use on site then monthly
Equipment in site offices	230v office equipment	Monthly	6 monthly	Before first use on site then yearly

Note : inspection and testing frequencies shown above are not legal requirements and are recommendations only.

As user checks, formal visual inspections and tests are performed, trends may appear which indicate that certain electrical items may need an increase or decrease in the number of checks and tests needed. This would be dependant on the environment in which the electrical equipment is being used and any problems found with the equipment over time.

Organisations may choose to test their portable electrical items all at the same time or perhaps test groups of equipment at different times. Groups could include all items situated in certain areas of the premises. Where items are grouped, then the frequency of testing should be based on the shortest testing interval, as stated in table 1 and/or 2, rather than the longest to ensure that all items are tested within a reasonable timescale.

A more effective method of testing would be to group items by the recommended frequency of testing stated in the above tables, e.g.: -

- Test all earthed equipment (Class I), e.g. electric kettles, some floor cleaners every 1 – 2 years.
- Test all 110v power tools used on construction sites on a 3 monthly basis.
- Annually test all equipment in a hotel used by members of the public.

Organisations that ignore the guidance on testing intervals are at risk of unnecessary testing and overspending.

In addition to the above it is important that electrical equipment is regularly serviced in accordance with the manufacturer's recommendations.

#### **4. Managing inspection and testing systems for portable appliances**

Organisations should consider implementing the following: -

- Identify equipment used in the workplace, where it is used and what it is used for.
- Agree a policy for unauthorised electrical equipment brought into the workplace.
- Implement a system for inspecting and testing electrical equipment and documenting results.
- Provide documented arrangements and procedures for inspection, testing and fault finding.
- Provide information, instruction and training for use, inspection and testing of equipment.
- Ensure competent persons undertake the inspection and testing.
- Monitor the findings of inspections and testing and consider any actions required from the results.

## AMENDMENTS

Issue 07/08: Updated to include grouping equipment for testing and clarifying parts of Table 1

Issue 07/12: Reformat to layout only

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