

## ***PAT Testing (Portable Appliance Testing)***

### **Why PAT Test?**

**Whilst PAT testing is not strictly compulsory, it is generally regarded as being the best way of meeting the electrical regulations that exist to protect employees, customers and tenants. Without it you could be in a very difficult situation if an electrical accident were to occur.**

All portable electrical equipment is subject to getting damaged during use, and this damage could render the equipment dangerous to the user. Without a regular programme of testing and inspection, you have not taken reasonable steps to ensure the safety of users.

Tests and inspections should be made at reasonable and regular intervals, bearing in mind the rate of use of both portable and fixed appliances.

Failure to comply with the Electrical Regulations may constitute a criminal offence under the Consumer Protection Act 1987 which carries a maximum penalty on summary conviction of a £5,000 fine and/or 6 months imprisonment. Landlords and letting agents could also be sued in Civil Law under the duty of care for failure to ensure the tenants safety and and, as a result, face punitive damages.

### **Legislation**

Current legislation demands that employers ensure portable appliances are safe. Here is a selection of some of the relevant regulations.

#### Electricity at Work Act 1989

To meet the requirements of the 1989 "electricity at work regulations it is widely regarded to be necessary to implement a programmed of planned inspection and testing of portable appliances, As may be necessary to prevent danger all systems shall be maintained so as to prevent so far as is reasonably practicable such danger.

#### Provisions & Use of Work Equipment Regulations 1992

Every employer shall ensure that work equipment is maintained in an efficient state, in efficient working order and in good repair.

#### Provisions & Use of Work Equipment Regulations 1998

Every employer shall ensure that the result of an inspection made under this regulation is recorded and kept until the next inspection under these regulations is recorded.

*Are you up to date with your Portable Appliance Testing?!*

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### **The PAT Testing Process**

Portable appliance testing includes a thorough visual check of the appliance and a series of tests on professional PAT testing equipment.

In accordance with the Health & Safety At Work Act 1974, the new 17th Edition Wiring Regulations and your company's Fire Risk Assessment, tests and inspections, etc, the appliance or lead being tested is checked for a variety of faults, and given a pass or fail sticker as appropriate. A certificate of testing is also provided for the business showing the results of all tests. We will effect minor repairs at the time of testing (for example an incorrect fuse rating or damaged plug or IEC lead) in order that the equipment is safe to use and can be passed; more significant faults or damage will be reported to the business manager.

The testing will involve switching items off if they are already on. To minimise disruption to staff and customers, the testing can be done out of hours in most circumstances – contact us for details.

### **Portable Appliance Testing**

The Inspection and tests that are to be carried out are described below, with tests varying dependent upon the class of appliance. However, the testing of all appliances is essential as part regular maintenance to ensure conformity to Electricity at Work Regulations.

### **Inspection**

Without passing the initial inspection, no appliance can be passed as safe. The inspection involves examination of the plug top, lead and the casing of the equipment. The plug top is checked for the correct fuse size, adequate cord grip, correct polarity and tightness of terminations, cracking, heat damage and a plug with insulating pins conforming to current BS standards. The casing of equipment is checked for any visual damage or cracks and any holes or vents that are apparent must not have a radius greater than 6mm. Also there must not be any live parts within 80mm of the aperture.

### **Class of Equipment**

- |          |  |
|----------|--|
| Class 1  | This is any equipment that has an earth connection from the mains supply. In most cases this equipment will have exposed earthed metal work and live parts will have basic insulation, e.g., fan heater, computer etc. |
| Class 2a | This equipment has no exposed metalwork and has two layers of insulation, e.g., desk calculator, dictation machine, etc.   |

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- Class 2b This equipment may have exposed unearthed metalwork, which will be separated from live parts by two layers of insulation, e.g., power drill, etc.
- Class 3 This equipment operates from a power supply less than 50v AC and has basic insulation with no earthed metalwork, e.g., lap top computer, mobile phone, etc.

### **Safety Checklist**

#### Pre-user Checklist for Portable Electrical Appliance Safety

	Yes	No
Is there damage (apart from light scuffing) to the cable sheath?	<input type="radio"/>	<input type="radio"/>
Is the plug damaged (e.g. the casing cracked or pins bent)?	<input type="radio"/>	<input type="radio"/>
Are there inadequate joints, including taped joints, in the cable?	<input type="radio"/>	<input type="radio"/>
Is the coloured insulation of internal cable cores showing where they enter plug?	<input type="radio"/>	<input type="radio"/>
Does the appliance appear to have been subjected to conditions for which it is not suitable (e.g.. is it wet or excessively contaminated)?	<input type="radio"/>	<input type="radio"/>
Is there damage to the external casing of the equipment or are there loose screws or parts etc?	<input type="radio"/>	<input type="radio"/>
Is there evidence of overheating (e.g.. burn marks or discoloration)?	<input type="radio"/>	<input type="radio"/>
Is the main on/off switch damaged, does it operate incorrectly?	<input type="radio"/>	<input type="radio"/>

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Assuming that equipment passes the visual inspection, the equipment can now be tested. Brief descriptions of the tests are detailed below indicating appropriate tests for the different classes of equipment.

Earth Continuity	This test ensures that an earth is present between the metalwork of an appliance and the earth pin of a plug top. This test is carried out on all Class 1 and some Class 3 equipment.
Insulation Resistance	This test is to indicate any breakdown in the insulation protecting the conductors. This test is carried out on all classes of equipment. Electronic equipment is exempt.
Load Test	This test checks that the equipment and fuses operate correctly and applies to all classes of equipment.
Earth Leakage	This test measures the leakage current to earth during the operation of the appliance and once again applies to all classes of equipment.

### **Test Equipment**

All Portable Appliance testing is to be carried out by PHR using appropriate instrumentation that should be calibrated regularly.

### **Key Features:**

Guaranteed Safety Tests

IEE Compliant labels  
Computerised Asset Register (see note)  
Bar Coded labels  
Bound Computerised Reports  
New/Changed Appliance Procedure  
Automatic Retests  
Framed Certificate of Compliance  
Reliable Appliance Searching

Serial numbers recorded as chargeable option.

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### **We...**

Open every plug  
Check every fuse  
Tighten every terminal  
Tighten every clamp  
Check every cord  
Safety check every appliance  
Apply PUWER 98 legislation  
Check Earth Resistance  
Test Incorrect polarity  
Test for Insulation resistance  
Test for function/Load  
Test for current leakage  
Check for shock risk  
Record every (DIGITAL) test result  
Keep your records for 7 yrs

### **Formal Visual Inspection**

A simple **P** (pass) or **F** (fail), not quite.....

The '**formal** visual inspection' as it is called is classed as formal because the inspection is actually recorded somewhere either on paper or computer record.

The appliance inspection will invariably have incorporated the following plus much more:

- Opening of the plug top,
- Checking for plug top damage,
- Checking the correct termination of conductors,
- Ensuring no reverse polarity on primary conductors,
- Tightening of terminals,
- Checking the flex anchorage,
- Checking the effective glanding,
- Checking for safe flex/cable routing,
- Ensuring correct fusing for both appliance and flex capacity,
- Checking current capacity of plug, flex and connectors in conjunction with the appliance load,
- Ensuring no overloading potential,
- Ensuring no damage to flex,
- Ensuring correct IP (ingress protection) of the plug for the environment,
- Ensuring safe location of the appliance,
- Checking for appliance damage,

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- Checking for appliance safe working under PUWER 98 (Provision and Use of Work Equipment Regulation 1998) within the limitations of the inspection
- The appropriateness of RCD protection associated with either the environment and or use to which the appliance is being put

We Provide a Customer Access Portal (WEBSITE) to download previous tests/log.

### **PAT Testing FAQ**

#### **What is a Portable Appliance?**

For the purpose of the legislation, a portable electrical appliance is taken to be an item of equipment which is not part of a fixed installation but is, or is intended to be, connected to fixed installation, or a generator, by means of a flexible cable and a plug and socket. Phew, heavy stuff eh? In layman's terms this means that any item with a plug is Portable Appliance. This would include electric drills, kettles, PCs, printers, monitors, extension lead and even some large items such as vending machines and photocopiers.

#### **Who does this apply to?**

The Electricity at Work Regulations (1989) placed a Legal responsibility on employers, suppliers and hirers etc to take reasonable steps to ensure that no danger results from the use of electrical equipment. This means all Portable Appliances at your place of work have to be regularly tested to ensure they are safe.

#### **How often do I have items tested?**

There is no specific schedule set out. There are however guidelines to help. The frequency of testing depends on the type of equipment and the environment in which it is used. For example a high-risk item such as an electric drill should be tested more frequently than a low risk item such as a PC. Furthermore a drill that is used every day in a high density manufacturing plant should be tested more frequently than a drill used only occasionally in an office environment. Essentially it is the responsibility of the employer to assess the risk involved and implement its own program of testing. Most companies still opt for a blanket test of all equipment on an annual basis to ensure conformity.

#### **Can anyone test items?**

No, the legislation states that the person testing the item must be a competent person.

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### **Is it done during normal office hours?**

This type of testing can be executed either during or outside of normal working hours. If you are in charge of a department budget you should be aware that it is likely that evening work and weekend work would attract uplift in costs.

### **Do we have to unplug the machines?**

Yes. In order to electrically test the equipment it needs to be disconnected from the mains and plugged into a testing device. This is how the electrical readings are obtained and a PASS or FAIL status is defined.

### **What are the implications for our I.T. systems?**

Since the early days of testing, the test equipment that PHR use has been adopted to ensure that no damage can be done to equipment during the test process.

### **What about our servers and critical systems?**

In some environments where it is not possible to turn equipment on and off, such as computer suites and comms rooms, it may only be appropriate for a visual inspection to be carried out. If this is the case, then every effort must be made to carry out a combined inspection and test at the next available times. This would normally be during a scheduled shutdown for maintenance purpose.

### **How long does it take?**

This will obviously depend on the number of appliances within your building and how easily accessible they are. A normal workstation with a computer, printer and extension lead would typically take between 10 and 15 minutes to test and reconnect. If you have any specific timescales to work to you should liaise with us and gain clarification.

### **What is the labelling system?**

All appliances that are tested should be given a unique form of identification. This will normally be in the form of an adhesive bar-code label indicating an asset number, the retest due date and initials of the PHR test engineer.

### **Do I have to keep records?**

Once again, the guidelines are sketchy as to the necessity of testing records. It should be viewed as best practice to adopt a register of all Portable Appliance Testing. In this way we are able to demonstrate that we have safely maintained the equipment within our control.

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### **What happens if an item fails?**

Most failures are found during the initial visual check (i.e. a cracked plug or an incorrectly rated fuse). These minor repairs will be carried out during the course of the works however other failures may not be fixed quickly and PHR would take them out of service to eliminate danger to your staff.

IES -Integrated Electrical Services