

A short guide to PAT Testing

1) Why portable appliance test?

PAT testing is not a legal requirement. However the Electricity at Work Regulations requires employers to provide safe electrical equipment for their staff and public to use. PAT testing is the most practical method for proving this.

This is to ensure that there is no risk of electrocution from exposure to live conductors, fire from high resistance faults and arcing due to intermittent connection.

The point of portable appliance testing is to confirm that an electrical appliance is safe and serviceable at the time of testing. For that reason a record should be kept of the test and a pass label adhered to the appliance when it passes its test.

2) What is a portable appliance?

There is an official definition of portable, static, fixed and built-in appliances. But it can be taken as anything that is connected to the mains electrical supply by means of a plug or flexible wire.

This includes drills, soldering irons, hair dryers, irons, heaters, kettles, computers, lamps, televisions, music players, office, kitchen and laundry equipment, etc., and their power cords. If power cords are detachable they should be tested both alone and with the equipment they serve.

Also requiring testing are items such as extension leads with or without RCD protection, multi-way and RCD adapters.

Equipment such as hand dryers that are connected to the mains should also be tested but personnel trained in safe isolation techniques should test these.

3) Who is responsible for the equipment being safe?

The whole line of management from owner to machine operator, and of course, the person undertaking the Formal Inspection. There is special responsibility placed on the Duty Holder, usually a line manager, or director to maintain records and to do risk assessments to establish the suitable inspection frequencies, to repair faulty equipment and interpret the results.

4) Who can PAT test?

A "Competent Person". This is defined as a person possessing sufficient technical knowledge or experience to be capable of ensuring that injury is prevented. The competent person must have an understanding of the types of electrical, mechanical and thermal damage of electrical equipment which may be encountered in any environment.

5) What tests or check should be done?

Operator checks each time the kit is used – there is no record if it is ok

Formal visual inspection – recorded

Combined visual inspection and electrical testing – recorded

6) How often should the tests be done?

Ask the duty holder, they should have done a documented risk assessment to establish the suitable frequency of inspection based on the asset, its location, the type of equipment, class of construction, frequency of use, competence of the user, how it's installed and previous test performance.

The IET publish a guidance table.

7) Does class matter?

Yes, the type of test and the frequency of tests you perform are dependent upon the construction class of an item.

Class I – does not rely solely on insulation to keep exposed metal safe, but they are connected to earth via the supply cable. Unless they have a class II or III symbol, they should be considered as Class I.

Class II – has extra insulation to keep things safe, it usually has a 2-core supply cable and should bear this mark 

Class III – equipment is supplied from a separated extra-low voltage source (SELV) and displays this mark . It can be tested using an insulation test and a check on the output voltage.

Extension leads and power cords – tested not only for continuity and insulation but also for the polarity of the line and neutral connections. Surge protected devices should be insulation tested at 250 V

8) How to do the tests?

Operator checks

When the operator starts working on kit they should look at the mains plug, flex and appliance for signs of damage or degradation. If signs are found they must be reported and recorded.

Formal visual inspection

Performed by the competent person at risk assessed intervals, the inspection should confirm that equipment is correctly installed, has sufficient ventilation, suitable for the application and environment in which it is operating, correctly guarded by switches, and that there are no known faults.

The inspector should then check the asset for damage and corrosion, over-heating and ingress of fluids or foreign bodies, the mains plug for damage over-heating, that the terminals and cable grip are properly secured and wired correctly with the right fuse.

The inspector should then look at the mains cable, confirm it is correctly rated for the equipment, the right length for the application, and without cuts, fray or unsafe joints.

It is recommended the Duty Holder keeps a record of results of the visual inspection.

Electrical tests

Part of the combined inspection, the construction class of the asset under test should be ascertained. It should then be connected to the tester, the correct test class key pressed (for IT and surge protected equipment the button should be held down for more than 2 seconds to switch from 500 V to 250 V insulation test) and the metal parts probed with the earth bond lead and insulation test probe as required. The tester will indicate whether the asset has passed or failed. Check your user guide for details.

If required by the duty holder results should be recorded and an appropriate test label affixed.

9) What records need to be kept?

The HSE guidance documents HSG107 and INDG236 advise that although not a legal requirement, it could be useful to keep a record of the visual and electrical results for future reference. The IET Code of Practice provides additional recommendations on record keeping and should include:

A register of all equipment

A record of formal visual inspection and combined visual inspection and electrical tests

A register of all faulty equipment

A repair register

A third party testing company should at least hold:

A record of formal visual inspection and combined visual inspection and electrical tests

A register of all equipment repaired

Templates for these can be found in the Code of Practice for In-service Inspection and Testing of Electrical Equipment Edition 4.

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