

In-Service Inspection & Testing of Electrical Equipment

A Guide for Duty Holders

Devonia  **Electrical**

Introduction

PAT, or Portable Appliance Testing, is colloquially used to refer to in-service inspection and testing of electrical appliances and equipment.

It is necessary in order to ensure as far as possible that electrical items which can be used by employees of a business, or the public, are safe for use.

Demonstration of adherence to PAT guidelines also helps limit the liability of a business, organisation or individual in the event of an accident occurring. Put simply, correct use of PAT principles can demonstrate to an investigating body or court of law that reasonable efforts have been made to ensure electrical safety.

Scope & Application

PAT applies to any organisation where electrical appliances are used by employees or members of the public. This includes, but is not limited to, shops, offices, construction sites, commercial & industrial facilities, health centres, schools, hospitals, hotels, Bed and Breakfast premises, rented properties, and holiday lets.

Despite PAT standing for Portable Appliance Testing, it is relevant not only to portable appliances, but any other appliance which plugs into, or is permanently connected to, a mains supply, including IT equipment, chargers, multi-way adapters, leads, tools, machinery, fridges, kettles, bathroom hand driers... The IET Code of Practice states that

all electrical systems and equipment should be maintained if danger would otherwise arise

PAT testing is consequently not applicable to some extra-low voltage equipment such as battery-powered appliances. It does, however, apply to mains-powered chargers, including laptop chargers.

Detachable mains leads which provide an earth facility (such as IEC leads, sometimes known as "kettle leads") are tested separately from the appliance they normally supply.

Legislation

PAT is not in itself a mandated requirement. Rather, adherence to PAT can demonstrate that reasonable efforts have been made to comply with specific elements of the following legislation:

- The Health & Safety at Work Act 1974, which states that "It shall be the duty of every employer to ensure, so far as is reasonably practicable, the health, safety and the welfare at work of all his/her employees." The Act also places a duty of care for the safety of non-employees in some circumstances.
- The Provision and Use of Work Equipment Regulations 1998, which state that "Every employer shall ensure that work equipment is so constructed or adapted as to be suitable for the purpose for which it is used or provided".
- The Electricity at Work Regulations 1989.
- Workplace (Health, Safety and Welfare) Regulations 1992, which require you to ensure that workplace equipment is maintained in efficient working order and in good repair.

- The Housing Act 2004 (England and Wales), which is relevant to privately rented homes and Houses in Multiple Occupation.
- The Electrical Equipment (Safety) Regulations 1994, which require landlords to ensure any electrical appliances supplied as part of a tenancy are safe when first supplied: i.e. when new tenants take over a tenancy.

Conversely, an organisation which does not follow PAT guidelines will find it difficult or impossible to demonstrate adherence to this legislation in the event of an accident, and therefore may be held liable.

Disclaimer

Information is provided in this document for convenience. For further information and clarification, consult the IET Code of Practice for In-service Inspection and Testing of Electrical Equipment, or other relevant legislation. The information provided is based around the IET Code of Practice 4th Edition and may be superseded. Errors and omissions excepted. No liability will be accepted for any consequences arising from the information contained herein.

Responsibilities

Individuals responsible for electrical equipment safety fall into three categories:

- **Users** of electrical equipment.
- **Duty Holders** - persons managing a maintenance scheme. If you are reading this, it's most likely because you are a Duty Holder.
- **Competent Persons** undertaking inspection and testing. In this case, this applies to the Devonia Electrical engineer, or qualified & accredited engineer from any other organisation providing PAT testing.

Testing

There are three elements to in-service inspection and testing:

- **User checks**, carried out by the equipment user and not a specialist engineer.
- **A Formal Visual Inspection**, carried out without specialist equipment.
- **A Combined Inspection & Test**, where further testing is carried out using specialist testing equipment.

The last two elements must be carried out by a competent person, i.e. one with a suitable level of training and formal certification, using equipment that is suitable for the purpose and appropriately calibrated. Large organisations may employ personnel specifically for this task, but smaller organisations will normally contract inspection and testing out to a specialist organisation such as Devonia Electrical.

Inspection and Testing Intervals

Inspection and testing intervals are determined by the engineer carrying out the PAT testing, often using the IET Code of Practice as a basis, but taking specific circumstances into consideration. Inspection and testing intervals may vary from 1 month to 60 months, depending on the type of equipment and situation in which it is used.

For example, equipment in hotel rooms, which will be used by the public, will typically have a shorter inspection & testing interval than equipment in a hotel office used only by staff.

Class 2 equipment (fully insulated and not requiring an earth connection) may not formally require the Combined Inspection and Test at all, and may be subject to Formal Visual Inspection alone. However, in practice it often makes sense to carry out testing anyway at the same time as testing Class 1 equipment.

Testing is not normally required for brand new equipment; consult us for a recommendation on first visual & combined inspection / testing intervals, which will vary with the type of equipment and how it is being used.

Many organisations will bring testing intervals forward such that much or all equipment falls into the same testing cycle, for ease of management and record-keeping.

Record Keeping

Record-keeping is not mandatory. However, the IET Code of Practice suggests a pattern of record-keeping as a way to demonstrate compliance with the relevant legislation.

Devonia Electrical recommends the following records are kept, in accordance with the IET Code of Practice:

- An **equipment log**, on which all relevant equipment is recorded, along with its testing interval as determined by the engineer.
- **Testing logs** for each item of equipment.
 - These two logs may be combined for ease of management.
- **Faulty Equipment and Repair registers**, recording that equipment determined to be faulty through testing or otherwise has been dealt with in an appropriate and structured manner.

For large organisations, we recommend that the functions of each of these documents are managed in a centralised spreadsheet.

If you do not already have a suitable framework for documentation, Devonia Electrical will provide appropriate documentation for your requirements at the point of initial testing.

Your Responsibilities

- Ensure all equipment users know that they are responsible for monitoring equipment (including plugs and cables) for obvious visual damage, defects and malfunction. They should be instructed to remove from service and report any defective equipment (IET, 2012).
- When new equipment is sourced, add it to the PAT Equipment Register.
 - Record detachable 3-pin leads as individual items, as they should be managed and tested separately.
 - We recommend you label equipment with an asset number in order to facilitate tracking, in-service testing and lifecycle management.
- Monitor the inspection and testing intervals for each item of equipment and ensure it is tested on schedule in accordance with the engineer's recommendations.
- When equipment is faulty, record it on the Faulty Equipment Register, or the Repair Register, as appropriate.
- When PAT testing is carried out, make these documents available to the engineer in order that they can be updated as appropriate.

If you are part of an organisation sufficiently large that equipment may be procured without your knowledge, ensure that relevant processes are updated such that all new equipment is recorded, and that personnel responsible for this are aware of these requirements.