

Portable Appliance Testing (PAT) Standard

Higher risk environments or activities

This section of the PAT Standard provides information *in addition to* that given in low risk environments and so should be read in conjunction with this and also 'PAT Explained'.

Local rules requiring a higher standard of electrical safety

Local rules may be in place for some *higher risk environments* such as Biological Sciences or Computer Science and Electronic Engineering, Information Systems Services computer workshops or *higher risk activities* such as laboratory work, use of electrical equipment in building or production workshops, work with patients or professional catering wet rooms and kitchens.

Higher risk environments or activities are those where the risk of injury from electricity or fire is strongly linked to where and how it will be used, such as:

- where electrical equipment, including extension leads, are moved often and more likely to become damaged;
- in wet surroundings – unsuitable equipment can easily become live and can make its surroundings live;
- outdoors – equipment may become wet and be at greater risk of damage;
- in cramped spaces – where it could be difficult to avoid a shock if an electrical fault developed;
- in a potentially flammable or explosive atmosphere where electricity could be the source of ignition.

Higher risk environments will require a higher standard of safety precautions against contact with live parts, faults which could cause fire, or electricity as a possible source of ignition. The department or area's risk assessment should detail the electrical risks specific to that area and/or activity and the associated control measures.

The Head of Department / Section / Business Unit, Departmental Health and Safety Officer or person responsible for the area should be able to advise what is required, or see Points of Contact – Electrical Safety.

Does brand new electrical equipment require PAT?

Local rules may be in place which require either a formal visual inspection or combined PAT to be carried out *before* electrical equipment is connected to the mains supply for the first time. Check with the person responsible for arranging PAT in your area.

How often should PAT be carried out?

Catering and hospitality

The Health and Safety Executive have specific guidance on maintenance priorities, including PAT, in catering establishments. See www.hse.gov.uk/pubns/cais12.htm.

Theatres and entertainment venues

Theatres and entertainment venues, have their own industry guidance on electrical safety and PAT, available from the Association of British Theatre Technicians (<http://www.abtt.org.uk/resource/codes-forms-and-updates>) and Health and Safety Executive (www.hse.gov.uk/pubns/indg247.pdf). This guidance should be referred to if you are responsible for a theatre or entertainment venue in order to determine the frequency of PAT and records to be kept. In addition the Health and Safety Executive also publish 'Electrical Safety at places of entertainment' (www.hse.gov.uk/pubns/g50.pdf).

Other common types of equipment in higher risk environments

University guidance is summarised in the tables below. See the Glossary of Terms for an explanation of Class I and Class II electrical equipment. The person responsible for a particular area or electrical equipment may wish to carry out PAT more often, however the frequencies indicated below should be the minimum. See Points of Contact – Electrical Safety should further clarification be needed.

HIGHER RISK ENVIRONMENTS WHERE DIFFERENT FREQUENCIES OF PAT MAY BE REQUIRED				
Area / Work Environment	Examples	Type of PAT and guide frequency		
		Simple Visual Check ¹	Formal Visual Inspection	Combined PAT (Note: may be required earlier in some circumstances. See 'PAT explained')
Information Systems Services	Computer laboratories	Yes	No	Annual
	Rarely moved network equipment (eg mains extension cables) in service risers, plant rooms, ducts	Yes	No	5 years or with scheduled maintenance
Audio Visual Media Services	Teaching rooms Lecture rooms	Yes	No	Annual
	Any audio visual equipment which is hired, leased or loaned	Must be treated as hire, lease or loan equipment as appropriate (see table in PAT Explained)		
Laboratory	Laboratory testing, analysis, research equipment	Yes, before use	No	Annual
	Any equipment issued to students	Must be treated as hire, lease or loan equipment as appropriate (see table in PAT Explained)		
Workshop, eg EMS workshops E15 workshops	Portable drill Soldering iron Portable pump Mains operated saw Mains operated sander	Yes, before use	No	Annual
Estate Management Section (Building Services)	Vacuum cleaners	Yes, before use	No	6 monthly
School of Health and Human Sciences	Medical apparatus used for patient care / monitoring, or for analysis or research	Refer to the relevant Hospital Technical Memorandum		

¹ When installed, moved or may be included as part of an annual health and safety inspection

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Accommodation residences	University owned equipment used by students or residents, eg iron, kettle	Yes, by University staff	No	Annual
	Free standing fridges / freezers in student residences	Yes, before use	No	Annual
	Cleaning equipment: <ul style="list-style-type: none"> ▪ Scrubbers ▪ Vacuum cleaners 	Yes, before use	6 months	Annual
	Any equipment issued to residences or students, eg heaters	Must be treated as hire, lease or loan equipment as appropriate (see table in PAT Explained)		
Wivenhoe House Hotel	Hotel bedrooms	Yes, before letting	No	Annual
	Communal areas Teaching rooms Function rooms	Yes	See Equipment Type	
	Commercial catering equipment	Yes, before use	6 months	Annual
	Any equipment issued for a function	Must be treated as hire, lease or loan equipment as appropriate (see table in PAT Explained)		
Catering outlets	Commercial catering equipment	Yes, before use	6 months	Annual

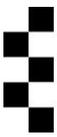
Who carries out PAT?

Those responsible for higher risk environments or activities may choose to appoint University staff to undertake PAT duties for formal visual inspection and/or combined PAT, known as 'PAT testers'. This may offer the advantage of being able to carry out PAT whenever it is required, such as when electrical equipment is used in a work area for the first time, and may be more cost effective in some areas. Examples include:

- Department of Biological Sciences
- Department of Computer Science and Electronic Engineering
- Information System Services
- East 15
- Students Union

Depending on the nature of the task and level of risk, a risk assessment and safe system of work or local rules may need to be in place.

² When installed, moved or may be included as part of an annual health and safety inspection



Minimum requirements for training and experience of PAT testers

Industry qualifications for in-service inspection and testing of electrical equipment, alone, do not necessarily demonstrate competency. PAT testers must have sufficient experience and technical knowledge to carry out a formal visual inspection and/or combined PAT without putting themselves or others at risk. The IET Code of Practice for In-service Inspection and Testing of Electrical Equipment (Fourth Edition) advises the following:

Training

Training should cover the different types of equipment to determine test procedures and frequency of inspection testing, familiarity with test instruments including their limitations and restrictions, the PAT tester's responsibility for sign off of PAT, basic electrical and electronic principles (such as how single phase electricity works and the hazards), how electrical / mechanical / thermal damage can occur, safe isolation procedures and safe systems of work. Examples might include the Level 3 Certificate for the Inspection and Testing of Electrical Equipment (City & Guilds, reference 2377-12), or the Association of British Theatre Technicians CPD course on PAT (part of the Silver Award on Electrical Safety), or an equivalent alternative qualification.

Experience

The PAT tester should have sufficient experience and technical knowledge to perform the inspection and testing without putting the PAT tester or others at risk. This includes an adequate understanding of the equipment to be worked on and practical experience of that system, the hazards and precautions to be taken and whether it is safe to continue. Newly qualified PAT testers will require adequate supervision by a competent person whilst this experience is gained. City and Guilds offer a Level 3 Certificate of Management of Electrical Equipment Maintenance for supervisors of multiple PAT testers.

Persons who repair faulty electrical equipment

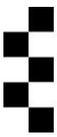
Any person repairing faulty equipment should be able to safely and effectively repair the faulty item of equipment without putting themselves or others at risk. Suitable training and experience will be needed.

Training records for PAT testers must be held by the person responsible for the PAT tester/s in their area. Records, including certificates, could be requested for the purposes of inspection, audit, annual health and safety inspection or as part of an investigation and so should be readily available if requested.

Minimum requirements for PAT testers to be authorised to carry out PAT

The Head of Department / Section / Business Unit is responsible for authorising those individuals who they deem competent to carry out formal visual inspections and/or combined PAT. The names and contact details for authorised PAT testers should be available locally and included in the Health and Safety Management Statement or similar document.

The Head of Department / Section / Business Unit must also notify the Deputy Director of Estate Management (Maintenance) of those personnel, who will keep a central record of authorised PAT testers. Periodical reviews of authorised PAT testers may be carried out.



How should PAT be arranged?

The task of noting the next due date for respective levels of PAT may be delegated to the Departmental Health and Safety Officer (DHSO), similar appointed person or the authorised PAT tester for your area. They will then advise appropriate arrangements for PAT, whether through the Estate Management Section Helpdesk (Colchester campus), the facilities management provider (Southend and Loughton campuses), or the authorised PAT tester for your area. See Points of Contact – Electrical Safety for email addresses and telephone numbers or your DHSO.

Is there a standard portable appliance testing device to be used?

No. The specification and features of portable appliance testing devices varies. The choice of which tester is appropriate will depend on how the electrical equipment is used and the depth of information needed.

The Institution of Engineering and Technology recommend that, “in low risk environments, a properly trained competent member of staff can perform these tests using a suitable ‘off the shelf’ PAT tester on equipment that is disconnected from the electrical supply. In higher risk areas a more highly trained specialist may be needed to disconnect the equipment from the electrical supply, perform complex tests and to interpret the results.”³ Such devices may need calibration and maintenance. Any person using a testing device must be competent in the use of that device and the interpretation of any test results.

Should records of completed PAT be kept by PAT testers?

Yes. Records of maintenance, including PAT results, should be kept for at least three years after the date when portable equipment is removed from the area or responsibly disposed of.

PAT testers may wish to record a summary of the outcomes of formal visual inspections and/or combined PAT on the templates provided. These are available in Word and Excel formats and can be customised to suit users’ needs. See The Institution of Engineering Technology’s Code of Practice for In-service Testing and Inspection of Electrical Equipment for guidance and templates to record detailed inspection and/or test results. Some test equipment offers the facility to download summary and detailed test results directly into a report.

Will there be a charge for PAT?

University owned electrical equipment of a specialist nature

If a department, section or business unit has specialised equipment specific to that area’s activities which requires testing by the Estate Management Section, this will be chargeable. A quotation can be obtained by sending an email to the Estate Management Section Helpdesk (see Points of Contact – Electrical Safety). However, such areas may have their own authorised PAT testers and so costs can be managed internally.

³ The Institution of Engineering and Technology, Portable Appliance Testing, Health & Safety Briefing No. 34c (May 2012)

University of Essex Campus Services / Wivenhoe House Hotel / Student Union

A charge will be made by the Estate Management Section for all levels of PAT required by these Business Units, or by the facilities management provider for the Student Union in Southend or Loughton.