Code of Practice for the Inspection and Testing of Portable Electrical Equipment (PAT)

Reviews and Revisions

Action	Date	Reason	Reviewer
Updated details of External PAT Contractor	17/02/16	New contract in place	L Salkeld D Ballantyne
Updated to reflect outsourced arrangements	16/05/16	New contract from 01/06/2016	L Salkeld
To reflect new PAT contractor	28/3/17	Contract with CET has expired and new contract has been awarded to PTSG	D. Ballantyne

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What is Portable Appliance Testing?

Portable appliance testing (PAT) is the term used to describe the examination of electrical appliances and equipment to ensure they are safe to use. Most electrical safety defects can be found by visual examination but some types of defect can only be found by testing.

Legislation

The Electricity at Work Regulations 1989 require that any electrical equipment that has the potential to cause injury is maintained in a safe condition. However, the Regulations do not specify what needs to be done, by whom or how frequently (i.e. they don't make inspection or testing of electrical appliances a legal requirement, nor do they make it a legal requirement to undertake this annually).

Responsibility

Executive Deans and Directors of Service are responsible for ensuring that equipment owned by their departments is tested in accordance with this Code of Practice.

Equipment which is part of the general fixtures and fittings within a building is the responsibility of Campus Services Department .

Equipment which is part of the general fixtures and fittings within accommodation buildings is the responsibility of the third party contract management company.

This Code of Practice will apply in Northumbria University properties whether managed directly or indirectly by a third party. The Responsible Person shall ensure suitable systems are in place to ensure compliance.

How frequently does equipment need to be tested?

The frequency of inspection and testing depends upon the type of equipment and the environment it is used.

For example cleaning equipment used daily could need testing every 12 months whereas equipment that is rarely moved perhaps as part of a desk management system could go up to 5 years between tests.

Another important item to include is a user visual check of the equipment prior to each use.

The best way to manage this is to list all the type of portable equipment in your area and the frequency of testing as indicated below

Equipment	Visual User Checks	Suggested Testing Frequency
Heater	Yes	12 monthly
Kettle	Yes	12 monthly
Lab equipment	Yes	12 monthly
Hidden extension lead	Whenever moved	5 years
Static I.T. equipment	Yes	5 years
Portable extension lead	Yes	12 monthly

These are initial testing intervals that can be reviewed and changed subject to test results.

Further guidance can be found at http://www.hse.gov.uk/pubns/indg236.htm

Do I need to keep records?

There is no legal requirement to label equipment that has been inspected or tested, nor is there a requirement to keep records of these activities. However, we recommend maintaining a record and labelling equipment tested as this is a useful management tool for monitoring and reviewing the effectiveness of the maintenance scheme and demonstrating that a scheme exists.

Do I need to test new equipment?

New equipment should be supplied in a safe condition and not require a formal portable appliance inspection or test. However, a simple visual check is recommended to verify the item is not damaged.

Testing Methodology

There are two approved methods within the university:-

1. Approved Contractor

Contact the approved PAT company Premier Technical Services Group (PTSG) with the following information:

Contact details
Location
Number of items to be tested
Date required allowing at least 2 weeks' notice
Contact – Lee Robinson Tel: 01977 668771 / 07703 701958 or leer@ptsg.co.uk
13-14 Fleming Court, Castleford, West Yorkshire, WF10 5HW

PTSG charge seventy pence for each item tested but this is on the basis that they will have a reasonable number of tests to complete. There is a minimum order charge of £55.00

It is advised that the most efficient way to do this is to test a complete area or building at the same time, it is best not to try to track individual assets as this is time consuming. The best method is to agree the area and the type of equipment to test then ensure that there is no equipment locked in cupboards etc. (this is cost effective and easier to manage test intervals).

PTSG will produce an asset list of the equipment tested along with all of the test results.

PTSG can also repair minor faults e.g.; incorrect fuse fitting

PTSG should be instructed to remove and make any failed appliances incapable of reuse.

2. Authorised Testers

Each Faculty and Service Department should appoint Authorised Testers who should be given a written authorisation and a copy of this Code of Practice, which clearly defines the extent of the electrical inspections and tests they are authorised to do. No Authorised Tester is expected to carry out tests on types of equipment with which they are not familiar, or is expected to make judgements on matters beyond their training or experience.

Authorised Testers should not undertake any repair work required on equipment as a result of these inspection and test other than replacing fuses and mains plugs, unless they have the required specialist electrical knowledge and experience.

The Authorised Testers initials on a PAT label signify only that the item of equipment to which it is attached passed the inspections and tests carried out on the stated date. The Authorised Tester is not vouching that the equipment will continue to be safe after the stated date. Authorised Testers may seek further advice from the Health, Safety & Sustainability Office (ext. 7318).

University Portable Appliance Testing (PAT) Scheme

Portable electrical appliances and equipment include any appliance which connects to single-phase electrical mains supply by a flexible cable and a 13-amp plug, or which plugs into an adaptor supplied from a 13-amp plug. NB - Extension leads and adaptors are included, and must be inspected and tested.

1. Inspection and testing will only be carried out by ***Authorised Testers***

2. All portable electrical equipment in the University is subject to periodic inspections and tests, with the exception of:

   (a) ***Rented or hired equipment or equipment on loan***. No electrical tests should be made, but a visual inspection of the mains lead, mains plug, and integrity of protective casing must be

made, and any defects which cannot be easily corrected should be reported to the owner of the equipment.

(b) ***Personal domestic equipment used by students within their rooms in Halls of Residence*** is exempted, but students are advised to maintain this equipment in a safe condition for their own protection. Students personal equipment in communal areas e.g. kitchens etc., will be subject to testing by Campus Services Department

(c) ***Contractor's equipment***. The safety of this equipment is the responsibility of the contractor, however as a minimum requirement all equipment must be tested prior to use in University premises and labelled accordingly

(d) ***Computers and associated IT equipment*** which is supplied by IT Services should be inspected and tested by them. In general, IT and other electronic equipment should not be tested with the PAT or PAC testers, as the tests is likely to damage the equipment. The mains lead and plug should be inspected, and the outer casing should be inspected for any damage.

3. Staff should be discouraged from bringing personal items of electrical equipment to work (e.g. radios, kettles and fridges). However, there may be circumstances when this is approved by the manager, in which case this equipment must be inspected and tested before use and then at intervals as specified in this Code of Practice.

   Equipment which fails the test must be removed from the University premises.

4. Where personal equipment is brought into the University by Staff or Students for use in an Art Installations or projects then it must be tested as per this Code of Practice.

5. Frequency of inspection and test will vary with different types of equipment and how often, or not, it is used. This should be determined by the owners of the equipment in line with Health & Safety Executive Guidance: http://www.hse.gov.uk/pubns/indg236.htm

6. New equipment, purchased from a reputable supplier need not be tested immediately. It should be added to the Inventory list and a label attached identifying the next date of inspection.

Appendix 1

Procedure for inspections and tests

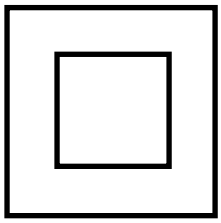
To be carried out only by a competent person who has been adequately trained to do so.

1. Check the electrical rating plate or label for the following:

   Voltage – should be 230 to 250 Vac

   Power Rating – should be less than 3 KW or 3000 W

   Protection Class – should be Class I or Class II (may be IIA or IIB)
   If Class II, the double insulation symbol must be shown as below:



2. Can the PrimeTest 50 be used on the equipment without causing damage to the software or electronics?

3. Inspection – part 1: external parts of flex and plug

   3.1 ***SAFETY FIRST*** – **Disconnect** the equipment from the mains supply.

   3.2 Is the **length of mains lead suitable** and safe for the equipment and the way it is used?

   3.3 Is the mains lead **firmly connected to the equipment** with a rubber or plastic bush if it passes through a metal panel? (Try pulling, pushing and rotating the mains lead).

   3.4 Are there any **kinks or knots** in the mains lead?

   3.5 Are there any **taped joints** in the mains lead?

   3.6 Is the **outer insulation**, including braid if present, intact and undamaged on the whole length of the mains lead?

   3.7 Is the **plug manufactured to British Standard BS1363** and feature **insulating shrouds or sleeves** on the live and neutral pins?

   3.8 Is the outside of the mains plug **cracked, damaged, or very dirty**?

Following this inspection, replace, or arrange to have replaced, any suspect mains plugs and arrange for any faulty mains leads to be replaced by a competent person.

4. Inspection – part 2: inside plug

4.1 Is the inside of the plug, and cover, free from **cracks, burns, or other damage**?

4.2 Is the cable **clamp intact and firmly gripping the outer sheath** of the mains lead?

4.3 Are the cable ends the right length, fully insulated almost to the plug terminals, and firmly attached to the correct terminals in the plug? ***Always double-check this.***

4.4 Is the **fuse correctly rated** for the equipment?

Following this inspection replace the fuse or plug if necessary or arrange for a competent person to do this.

5. Electrical safety tests using PrimeTest 50

Power ON/OFF press ***until a beep is heard the left hand and right hand buttons marked class 1 and class 2***

Warning: do not touch the equipment being tested while the test is being carried out.

5.1 Does the equipment have a 3-core mains lead (Class I) or a 2-core mains lead (Class II)? This will determine which button to press in the test

6. The Seward PrimeTest 50

Please note there is no need to test a mains plug socket

Testing a Class I Appliance

- If the appliance passes a visual inspection proceed with the electrical tests.
- Plug the earth test lead into the 4mm socket on the PrimeTest 50 end panel, the small black socket on the rear of the unit
- Plug the appliance into the PrimeTest 50 front panel mains socket, the three pin socket on the front of the unit
- Connect the earth test probe to an exposed metal part on the appliance, the black covered clip
- If the Appliance under test has an ON/OFF switch, make sure it is in the ON position.
- Press the Class I test key
- The PrimeTest 50 will now test the continuity of the protective earth.

- If the measured value is outside acceptable limits a cross is placed next to the ***Earth Cont.*** enunciator, a FAIL is indicated and the test sequence is halted.

The equipment has failed the earth test.

- If the measured value is within acceptable limits a tick is placed next the ***Earth Cont*** enunciator.

The equipment has passed the earth test.

- The unit will proceed with the Insulation test.
  Note: The power switch on the appliance under test must be in the ON position to perform an insulation test.

- Check that the appliance power switch is in the ON position. The test will automatically proceed if the appliance power switch is placed in the ON position.

- If the ***Check Connections*** enunciator remains on the display, the load presented by the appliance may be too small for the PrimeTest 50 to detect. In this case, press the test key to continue.

- If the Insulation Resistance is greater than the acceptable limit a tick is placed next to the ***Insulation*** enunciator and the ***PASS*** enunciator is illuminated.

The equipment has passed the insulation test

Testing a mains cord

- Plug the mains lead under test into the IEC socket and the front panel mains socket on the PrimeTest 50.

- Press the cords test key

- The PrimeTest 50 will now test the continuity of the protective earth.

- If the measured value is outside acceptable limits a cross is placed next to the ***Earth Cont.*** enunciator, a FAIL is indicated and the test sequence is halted.

- If the measured value is within acceptable limits a tick is placed next the ***Earth Cont.*** enunciator.

- The unit will proceed with the Insulation test.

- If the Insulation Resistance is lower than the acceptable limit a cross is placed next to the ***Insulation*** enunciator and the test sequence is halted.

The cord has failed the test

- If the Insulation Resistance is greater than the acceptable limit a tick is placed next to the ***Insulation*** enunciator.

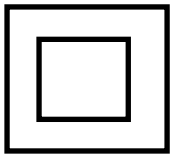
The cord has passed the test

- The unit will proceed with the wiring test, checking the live and neutral conductors for short or open circuits or reversed connections.
- If the wiring is correct a tick is placed next to the cord enunciator and a pass is indicated for the sequence

Testing a Class II Appliance

Check that the outer casing of the appliance is complete and undamaged
Inspect the flex and plug as per sections as above

Please note all class ll appliances MUST have a double square insulation sticker on



- If the appliance passes a visual inspection proceed with the electrical tests.
- Plug the earth test lead into the 4mm socket on the PrimeTest 50 end panel.
- Plug the appliance into the PrimeTest 50 front panel mains socket
- Connect the earth test probe to the appliance. There should be no exposed metal parts
- If the Appliance under test has an ON/OFF switch, make sure it is in the ON position.
- Press the Class II test key
- The PrimeTest 50 will now test Insulation Resistance.

Note: The power switch on the appliance under must be in the ON position to perform an insulation test. If no appliance is detected the PrimeTest 50 will display the following.

PrimeTest 50 Operating Instructions

- Check that the appliance power switch is in the ON position. The test will automatically proceed if the appliance power switch is placed in the ON position.
- If the ***Check Connections*** enunciator remains on the display, the load presented by the appliance may be too small for the PrimeTest 50 to detect. In this case, press the test key to continue.
- If the Insulation Resistance is greater than the acceptable limit a tick is placed next to the ***Insulation*** enunciator and the ***PASS*** enunciator is illuminated.

The equipment has passed the insulation test

Note: Items of ***Class 'O'*** equipment may sometimes be found. These have a metal outer case, a 2-core mains lead, and ***do not*** carry the double insulation symbol. This equipment is of foreign manufacture and ***is not acceptable for use in the UK.***

Class 'O' equipment must never be passed as safe for use by any Authorised Tester.

NOTES

i ***Portable electrical equipment*** is any equipment which connects to single-phase electrical mains supplies by a flexible cable and a 13 Amp plug, or which plugs into an adaptor supplied from a 13 Amp plug.

NB - Extension leads and adaptors are included, and must be inspected and tested.

ii ***Frequency of inspection and test*** will vary with equipment and use (see notes on 'Not to be used after' system).

Iii ***Equipment with a mains lead more than 3 metres long*** e.g. some overhead projectors, may fail the Earth Bond Test on PAT tester because of the resistance of the mains lead. In these cases only, a reading of 0.3 ohms or less will satisfy safety requirements.

iv If all inspections and tests are satisfactory, fix an initialled and dated 'Not to be used after' label to the mains lead near the plug.

v If any inspection or test is not satisfactory, or you are doubtful of the results:

- take the equipment out of use immediately;
- label the equipment to show the reason for failure;
- inform your supervisor that the equipment is in need of repair, or more specialist inspection, before it can be put back into use.

vi Equipment with plug-in, removable, mains leads

This equipment should be inspected and tested according to this Code of Practice, with the mains lead in use at the time of test. If tests are satisfactory, attach a 'Not to be used after' label to the mains lead, and a second 'Not to be used after' label in a conspicuous position on the equipment. This ensures that if labelled equipment is used with a labelled mains lead, it is known that both have been tested. Seeing the label on the equipment will also draw attention to the existence of a removable mains lead.

PASS LABELS

The Health and Safety Office issues rolls of labels for use on appliances that have passed the inspections and tests described above. The label should be securely fixed to the body of the appliance or its flex. Each label contains the following headings to be completed:

- *'Re-test on'* – based on the guidance given by the HSE and included in your training, state the date of the next re-test for this item.
- *Tester'* – the person conducting the test should put his/her initials here.
- *'ID No.'* – means of identifying the appliance.

Recording the results, keeping track of appliances

Where you have to inspect and test a large number of appliances, it is advisable to keep an inventory. Either the staff in a particular area can supply a list of the items for test, or you should complete one as you work through the appliances you have been given. An inventory is useful when keeping track of appliances; using the ID number for each item helps you to avoid confusing one item with another.