

# UNIVERSITY OF SHEFFIELD

## IN-SERVICE INSPECTION AND TESTING OF ELECTRICAL EQUIPMENT

### POLICY AND GUIDANCE

#### 1.0 INTRODUCTION

- 1.1 The Electricity at Work Regulations 1989 came into force on 1 April 1990. The Regulations are made under the Health & Safety at Work etc Act 1974 and require precautions to be taken to prevent death or personal injury from the use of electricity in work activities. The Regulations impose responsibilities on the employer and employees to conform to these regulations in every respect.

The inspection and testing of electrical equipment is an inherent part of compliance with the Regulations, therefore, The Institute of Electrical Engineers (IEE) have issued a Code of Practice for In-service Inspection and Testing of Electrical Equipment (IEE Code of Practice).

#### Applicable Legislation

- § The Health & Safety at Work etc Act 1974
- § The Electricity at Work Regulations 1989
- § The Management of Health and Safety at Work Regulations 1999
- § The Provision & Use of Work Equipment 1992

#### 2.0 STATEMENT OF INTENT

- 2.1 The University of Sheffield shall take all reasonable steps to ensure that all portable appliances are inspected and tested in accordance with the relevant IEE Code of Practice.

#### 3.0 DEFINITION OF PORTABLE APPLIANCES

- 3.1 Only Class I and Class II (see Appendix 2) electrical equipment fitted with a plug, and allowing disconnection from the electrical supply without the use of a tool, will fall within the scope of this Portable Appliance Inspection and Testing Policy.

There are other classes of electrical equipment but these tend to be specialist items and advice on suitable test frequencies should be sought from competent testers.

All portable electrical equipment should be fitted with a suitably fused, standard UK 3-pin plug. EU to UK plug adapters should only be used for very short-term usage.

All equipment not included in this definition (other than battery powered) must be identified by the Directors / Heads of Faculties / Departments and brought to the attention of Estates Services for inclusion in the Fixed Wiring Testing Register.

The 3<sup>rd</sup> edition of the IEE Code of Practice for the testing of portable electrical appliances states that microwave ovens are to be tested for microwave leakage on a regular basis. Where applicable this should be undertaken by the PAT testing resource for each Department.

- 3.2 The IEE Code of Practice also makes provision for the testing of single and 3-phase equipment, connected by means of a cord or cable, to a fused or un-fused connection unit or isolator (hard wired); or connected using a suitable single or 3-phase industrial plug and socket system. This equipment can be movable, stationary or built in.

#### **4.0 FREQUENCY OF TESTING**

- 4.1 All portable appliances shall be visually inspected or tested prior to being put into use within the University and thereafter the frequency shall be dictated by a risk based approach which will consider the following factors: -

- § User safety.
- § Condition of equipment.
- § Usage of equipment.
- § Movement of equipment.
- § Likelihood that the equipment could become damaged.
- § The environment that the equipment is located/used/stored in.  
(See Table 1 – “Testing Frequencies’ for guidance).

#### **5.0 LABELLING**

- 5.1 Each item of equipment to have the correct colour-coded label attached with the following information: -

- § The month and the year that the next test is due.
- § A unique identifier code on the item of equipment

#### **6.0 RECORDS**

- 6.1 The tests will be recorded to allow for future comparison, for written identification of defects to be remedied and to provide information for an assessment of risk.
- 6.2 Departments shall keep the results, as the Enforcing Authorities etc may wish to inspect them.

#### **7.0 RESPONSIBILITIES**

- 7.1 Portable electrical appliances must be regularly inspected and tested by competent persons to ensure that they can continue to be used safely.

- 7.1.1 The planned inspection and testing will include: -

- a) Visual Inspection for signs of damage or deterioration/ and

- b) Electrical tests, ie:
  - (i) an earth continuity test; and
  - (ii) relevant insulation tests

7.2 The Registrar and Secretary has the ultimate responsibility to ensure that the University of Sheffield complies with all statutory health and safety requirements. This responsibility is devolved to: -

7.3 Heads of Faculties, Departments, Schools etc shall be responsible for making their own inspection and testing arrangements and take all reasonable steps to ensure that: -

7.3.1 all new, on-loan, personal equipment etc that is brought into their University area is inspected or tested and deemed to be safe in accordance with the policy before being put into service.

7.3.2 any electrical equipment that is not deemed 'safe to use' is withdrawn from use into a suitable location to prevent re-introduction to use before it has been repaired/disposed of.

7.3.3 the risks to personnel are assessed and recorded.

7.3.4 records of inspections and tests are maintained.

7.3.5 all inspected or tested equipment displays the relevant sticker.

7.3.6 members of staff who have been appointed to inspect/test portable electrical appliances are competent to undertake the duties imposed upon them.

7.3.7 equipment located in their Faculty/Department etc, which falls outside the scope of this Policy, is brought to the attention of Estates Services.

7.3.8 all Contractors are informed that their equipment, and that of their sub-contractors, must display a current PAT Test sticker, i.e. that all items of electrical equipment display a sticker indicating the next test date is in the future, and that all equipment not conforming to this requirement must be removed from the University

7.4 Duties of Employees

7.4.1 All staff have a duty to take reasonable care for the health and safety of themselves and others who may be affected by their work. They also have a duty to comply with the University's arrangements for health and safety.

The University undertakes to inform all staff of their duties under the Regulations and provide appropriate information, instruction and training where required.

## 8.0 EQUIPMENT SUPPLIED FOR SERVICE (HIRE, LOAN OR OTHER)

- 8.1 It is the responsibility of the Head of Department to inform suppliers that equipment must be tested and labelled in accordance with the University policy prior to the equipment being brought into service.

## 9.0 PERSONAL EQUIPMENT

- 9.1 Any item of personal electrical equipment brought into the University and falling under item 3.1, to be used by staff must have the prior approval in writing from the Head of Department or nominated Deputy; See Appendix 1. Approved items must be inspected or tested in accordance with the University's Portable Appliance Inspection and Testing Policy prior to use and must be fitted with a suitably fused, 3-pin UK plug to BS 1363.
- 9.2 Personal electrical equipment in use in the University which has been brought in from countries outside the EU and is not CE Marked, should be taken out of use immediately, as many operate using different voltages to that in the EU and it can be unsafe, as well as illegal (not CE Marked), to use such equipment in the UK.
- 9.3 Equipment manufactured in the EU since 1995 will be CE marked and can therefore be used legally in the UK, but those fitted with "continental" plugs will not fit into British electrical sockets and you will need to either: -
- a) Remove and replace the continental plug by a British 13 Amp 3-pin plug with the appropriate fuse fitted for the equipment or cables to be protected (to be done by a person competent to undertake such work).
  - b) For short durations only, use a fused 2-pin to 3-pin adapter to enable them to be used with British electrical sockets. However, the adapter should: -
    1. Be CE marked,
    2. Be fused appropriately for the equipment or cables to be protected,
    3. Include an appropriate 'earth' connection,
    4. Have "shuttering" protecting the holes into which the plug is inserted to avoid the potential for accidental contact with live connectors in the adapter. Plug-in adapters (i.e. not extension cables) without "shuttering" should not be used.
    5. Be able to accept a single plug only unless the adapter is an "extension lead" with a suitably rated, and minimum length of cable between the fused plug-head and the multiple continental-socket box. If the continental sockets are not shuttered then the trailing lead must be fitted with a British 13 Amp 3-pin plug that has an integral Residual Current Device (RCD) with 30mA rated residual operating current.
    6. CE-compliant 2-pin to 3-pin adapters are available from CiCS.

## 10.0 STUDENT EQUIPMENT

- 10.1 Any item of personal electrical equipment brought into the University academic areas to be used by students should have the prior approval in writing from the Head of Department or nominated Deputy; see Appendix 1. Approved items must be inspected or tested in accordance with the University's Portable Appliance Inspection and Testing Policy prior to use and must be fitted with a suitably fused, 3-pin UK plug to BS 1363 .

## 11.0 RESIDENTIAL ACCOMMODATION

- 11.1 Equipment owned and supplied by the University of Sheffield as part of the lease agreement with the resident eg fridge, kettles, toasters, microwaves etc shall be tested in accordance with the University's Portable Appliance Inspection and Testing Policy.
- 11.2 Equipment owned by students and brought into the residences for their own use should be tested in accordance with the University's Portable Appliance Inspection and Testing Policy.

## 12.0 COMPETENCE

- 12.1 Inspection or testing of portable equipment must be carried out by competent persons ie staff who have received suitable and sufficient training in either ' Visual Inspection' or 'Portable Appliance Testing'. [*Visual Inspection training is available from Safety Services, email [b.gouldsbrough@shef.ac.uk](mailto:b.gouldsbrough@shef.ac.uk)*]

In the case of inspecting or testing hard wired, single or 3-phase equipment, the persons must be competent to isolate equipment before testing.

- 12.2 Guidance (see item 14.0) as to whether an individual is competent to undertake a particular task is left to the Department Head. It is necessary to assess the job's skill content against the individual's attributes taking into account his/her: -
- a) electrical knowledge
  - b) electrical experience
  - c) understanding the hazards which could arise; and
  - d) the ability to recognise at any time whether it is safe to continue to work

- 12.3 Where commercial external electrical contractors are employed, University staff shall request written evidence of their competence.

## 13.0 EQUIPMENT FAILURE

- 13.1 Any item of equipment which fails the inspection / test, shall be: -

- § Clearly labelled with a "FAIL" or "DO NOT USE" sticker.
- § Removed from service IMMEDIATELY by the Department.

- § Cable or plug removed or Plug-lock fitted, to ensure that it cannot be used.
- § Not put back into service until the fault is rectified and the equipment is re-tested, or
- § The item is deemed redundant and disposed of accordingly by the Department and the disposal registered on the Department's Asset Register.

#### 14.0 GUIDANCE

Portable appliance testing, microwave oven testing or the visual inspection of electrical equipment within your workplace can be carried out by: -

- § The Portable Appliance Testing team within Safety Services.
- § Departmental staff who have been trained and have the required knowledge and experience who are deemed competent to carry the required visual inspection or testing of electrical equipment.
- § A commercial external electrical contractor with the required knowledge, competence and experience.

**Table 1 - TESTING FREQUENCIES\***

Type of Equipment	Class of Equipment	Condition / Usage / Environmental Conditions	Visual Inspection (VI)	Combined Inspection & Test
Handheld	Class I	Heavy / frequent use; harsh environments; high potential for damage / misuse/cable damage etc E.g. Heavy engineering workshops, excavations & other construction-type sites	Daily user check	On acquisition & 3+1 months
		Benign environment, light infrequent use, low potential for damage / misuse etc. Research laboratories, electrical workshops, building maintenance equipment	Daily user check	On acquisition & 6+2 months
	Class II	Heavy / frequent use, harsh environments, high potential for damage / misuse / cable damage etc E.g. Heavy engineering workshops, excavations & other construction-type sites	Daily user check	On acquisition & 6+2 months
		Benign environment, Light infrequent use, low potential for damage / misuse etc. Research laboratories, electrical workshops, building maintenance equipment. Extension Leads.	Formal VI on acquisition & Daily user check	12+3 months
Moveable	Class I	Heavy / frequent use, harsh environment, high potential for damage / misuse/cable damage etc. Heavy engineering & transport workshops	Formal VI on acquisition	6+2 months
		Benign environment, Light infrequent use/movement, low potential for damage / misuse etc. Research & teaching laboratories and associated equipment, light engineering workshops.	Formal VI on acquisition	12+3 months
	Class II	Heavy / frequent use, harsh environment, high potential for damage / misuse/cable damage etc. Heavy engineering & transport workshops.	Formal VI on acquisition	12+3 months
		Benign environment, Light infrequent use/movement, low potential for damage / misuse etc. Research & teaching laboratories and associated equipment, light engineering workshops.	Formal VI on acquisition	24+3 months
Stationary and IT	Class I	Operating in harsh environment or potential for damage / being struck by other equipment /cable damage etc. E.g. engineering workshop,. research & teaching laboratories	Formal VI on acquisition	12+3 months
		Benign environment, low risk of damage. E.g. offices etc.	Formal VI on acquisition	24+3 months
	Class II	Operating in harsh environment or potential for damage / being struck by other equipment /cable damage etc. E.g. engineering workshops, research & teaching laboratories.	Formal VI on acquisition	24+3 months
		Benign environment, low risk of damage. E.g. offices etc.	Formal VI on acquisition	48-60 months
Permanent secure IT installations		Server Rooms etc with restricted access, optimum environmental conditions and no movement of equipment or potential for mechanical damage following testing on installation	12-24 months	On installation & every 60 months
Hard Wired	Single and 3 Phase Equipment	May fall into any of the above categories, but is single and 3-phase equipment, connected by means of a cord or cable, to a fused or un-fused connection unit or isolator (hard wired).	Formal VI per 12 months	On installation 12-60 months Risk Based

\*Based on HSE guidance "Simple precautions – Work using electrically powered equipment"

## **APPENDIX 1 – PERSONAL AND STUDENT EQUIPMENT APPROVAL**

Blanket approval is considered reasonable for personal and student equipment which is in **good condition with no damage** which operates on:-

- c) dry cell battery only,
- d) internal rechargeable battery with a detachable charger having an output of less than 25 volts, e.g. for mobile telephones,
- e) 240 volt transformers for laptops or similar, having an output of less than 25 volts with integral 240 volt lead complying with the requirements of section 9.0,
- f) 240 volt equipment which is double insulated (see below) and operates on very low currents, e.g. radios.

Personal and student equipment with heating elements (e.g. kettles, toasters and other cooking equipment) or likely to create significant disruption for others (e.g. HiFi's or other high noise producing equipment), should not be brought into the University under any circumstances.

## **APPENDIX 2**

### **CLASS I EQUIPMENT – Definition and examples**

These items have live parts protected by basic insulation and a metal enclosure or accessible metal parts that could become live in the event of failure of the basic insulation (indirect contact). Protection against shock is by basic insulation and earthing via casing the cpc in the supply cable and the fixed wiring.

Typical Class I items include extension cables, fridges, toasters, kettles, autoclaves, some electric heaters, most printers, most photocopiers, centrifuges, freezers, microwave ovens, furnaces, lathes and pillar drills etc.

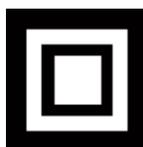
### **CLASS II EQUIPMENT – Definition and examples**

Commonly known as double insulated equipment, the items have live parts encapsulated in basic and supplementary insulation (double), or one layer of reinforced insulation equivalent to double insulation.

Even if the item has a metal casing (for mechanical protection) it does not require earthing as the strength of the insulation will prevent such metalwork becoming live under fault conditions. The cable supplying such equipment will normally be two core.

Examples of Class II equipment would include adaptor/power supply units, radios, TVs, , some electric heaters, desk lamp/fan, some printers, some photocopiers, scanners, relevant mains leads to IT equipment etc. All such items should display a Class II equipment symbol:

**Double Insulated**



If an item of electrical equipment does NOT have this symbol, then you must treat it as Class I electrical equipment.