Information Sheet – Electrical Inspection and Testing

The Electricity at Work Regulations place a legal responsibility on employers, employees and self-employed persons to comply with the provisions of the regulations and take reasonably practicable steps to ensure that no danger results from the use of electrical equipment. This in effect requires the implementation of a systematic and regular program of maintenance, inspection and testing.

What do we mean by inspection and testing?

Inspection of equipment implies just that. A visual check for obvious defects such as:

- damaged flexes,
- damaged equipment,
- flexes taped over during unauthorised repairs,
- flexes pulling away from plugs,
- signs of overheating (e.g. burn marks or discolouration), cracked plugs.

Opening of the plug cover will enable further checks to be made. However this should be undertaken by a competent person in order to determine if:

- the fuse the correct one?
- the terminals are correctly wired and secured?

Testing involves the use of a device to check the electrical integrity of the equipment. This can highlight faults such as loss of earth integrity or insulation failure which cannot be determined by visual inspection alone. Simple pass/fail type Portable Appliance Testers (PAT) are available for this. There are also more sophisticated instruments available which give readings of various electrical parameters and clearly need more interpretation.

What levels of inspection and testing are required?

Maintenance of portable electric equipment can be achieved by a combination of actions applied at three levels:

a) checks by the user;

b) visual inspections by a person appointed to do this;

c) combined inspection and tests by a competent person or by a contractor (commonly known as the PA test).

Action should be taken where faults are found, particularly where detected fault levels or types of faults are found repeatedly.

User Checks (Visual)

The person using the equipment should be encouraged to look critically at the electrical equipment they use and, after a minimum of basic training, visually check for signs that the equipment is not in sound condition, for example;

- there is damage (apart from light scuffing) to the cable sheath;
- the plug is damaged, for example the casing is cracking or the pins are bent;
- there are inadequate joints, including taped joints in the cable;
- the outer sheath of the cable is not effectively secured where it enters the plug or the equipment. Obvious evidence would be if the coloured insulation of the internal cable cores were showing;
- the equipment has been subjected to conditions for which it is not suitable, e.g. it is wet or excessively contaminated;
- there is damage to the external casing of the equipment or there are some loose parts or screws;
- there is evidence of overheating (burn marks or discoloration).

These checks also apply to extension leads and associated plugs and sockets. The user should undertake checks when the equipment is taken into use and during use. Any faults should be reported to heads of service and the equipment taken out of use immediately. Senior managers should take effective steps to ensure that the equipment is not used again until repaired by a person competent to carry out the task.

Formal visual inspections

This is a process of simply inspecting the appliance, the cable and the plug for any obvious signs of damage. According to the HSE, this process can find more than 90% of faults. The visual inspection is reflective of the users checks above but would include (where relevant) an inspection of the inside of the plug. Note the inside of the plug should be checked unless it is moulded or there is an unbroken seal covering the screws (bad internal wiring or an unsuitable fuse would cause the item to be classed as dangerous). This inspection should be recorded and should take place on an agreed frequency – for example every time there is an inventory check.

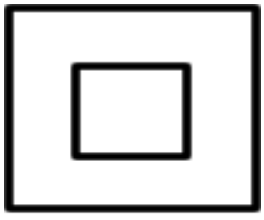
Appliance Testing

At periodic intervals, relevant portable appliances are tested to measure that the expected degree of protection remains in place and is adequate. This process involves a formal visual inspection followed by testing with a specialist machine.

The tests that an individual must carry out to declare an item electrically safe is dependent on the class of construction but would include:

- earth continuity testing
- insulation resistance testing
- polarity of wiring check

The findings of this check must also be recorded. It should be noted that double insulated equipment will not normally need appliance testing. A



Symbol for
double Insulation

formal visual inspection will normally be enough to demonstrate compliance. An inventory of electrical items should indicate which items are double insulated and therefore do not need formal testing.

Note: leads such as kettle leads and PC power leads provide power to double insulated equipment, but are not double insulated themselves and therefore require formal testing at an appropriate frequency.

Who is competent to undertake such tasks?

Visual inspection can be undertaken by an employee who has knowledge and understanding of what to look for. This could potentially be someone who has previous electrical experience or as completed a short training module.

Simple PAT testing can also be undertaken by a non-electrical specialist, provided that person has been trained in how to use the equipment. It is important that where such 'lay-people' are used, that they are empowered to seek further assistance when the limit of their competence has been reached. Any equipment failing such tests should be withdrawn from use and sent to a qualified electrician for further testing and repair or it should be disposed of in a manner that prevents any erroneous return to use.

Developing a Maintenance regime

In order to ensure that legal requirements are met, a system needs to be put in place which ensures that:

- all equipment to be maintained is identified;
- types and frequencies of inspection/testing have been established. An initial check needs to be undertaken;
- staff are discouraged from bringing electrical equipment from home to work. If they do, such equipment must be included in the inspection/test regime;
- those undertaking maintenance have appropriate levels of competence; and
- records of inspections/tests are maintained. It is also helpful to place a marker/sticker on each item which has passed its test, indicating when re-testing is required.

The regime should be regularly reviewed to ensure that the intervals are appropriate. Guidance on frequencies of inspection and testing can be found in Guidance Document (GD22) - Safe Use of Electrical Extension Cables (or similar). General safety inspections will help to identify areas of unsafe practice e.g. trailing cables; equipment whose vents are covered and are in danger of overheating; fan heaters on timers which could switch on when the office is un-occupied etc.

Further Guidance:

AS16 – Electricity in the Workplace;
GD9 – Electrical Testing or Portable Equipment and Fixed Systems
GD22 - Safe Use of Electrical Extension Cables (or similar).

Safety & Wellbeing team healthandsafety@northlan.gov.uk