The Preventative Role of Portable Appliance Testing – 25 Years of the Electricity At Work Regulations 1989

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Seaward Group

Who are Seaward?

- Market leaders in the manufacture of electrical safety testing equipment.
- Established in 1982 & continually provides test solutions to enable companies and organisations to comply with the demands of meeting all types of safety legislation.
- Seaward Electronic covers a wide range of product from our popular PATs and Installation equipment to High Voltage Testers.
- Seaward operates from purpose built premises in Peterlee, County Durham in the North East of England and is still a family owned business.
- Seaward are proud to promote the fact that we are 100% British with the majority of product used in assembly being UK sourced.

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30 Years of PAT innovation

- The first handheld tester
- The first battery-powered tester
- The first tester with memory
- The first accurate and reliable earth continuity test (patent pending)
- The first integral camera
- The first built in risk assessment

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Why customers choose Seaward

- British made quality
- 30 years of PAT innovation
- Free technical product support
- Host of online support materials
- Carefully selected range of accessories
- Complementary software packages
- Comprehensive product range

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Introduction

- Before the EAWR 1989 testing the electrical safety of equipment was only common practice in government properties
- EAWR 1989 set out to raise standards in electrical safety
- No specific requirement for testing of portable appliances
- Onus on duty holder to ensure that equipment in the workplace is maintained so as to prevent danger (EAWR 1989 section 4)
- This implies the requirement to perform in service inspection & testing

The Law

- 4. (1) All systems shall at all times be of such construction as to prevent, so far as is reasonably practicable, danger.

- (2) As may be necessary to prevent danger, all systems shall be maintained so as to prevent, so far as is reasonably practicable, such danger.

- (3) Every work activity, including operation, use and maintenance of a system and work near a system, shall be carried out in such a manner as not to give rise, so far as is reasonably practicable, to danger.

- (4) Any equipment provided under these Regulations for the purpose of protecting persons at work on or near electrical equipment shall be suitable for the use for which it is provided, be maintained in a condition suitable for that use, and be properly used.

Electricity at Work Regulations (1989)

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Industry guidance and existing practice

- HSE Guidance Note HS (G) 107 (1994) 1st comprehensive guide on in-service inspection & testing.
- IEE Code of Practice soon followed with a clear message of importance of regular testing & inspection routines.
- HSE Guidance Notes are published alongside IEE (now IET) updated Codes of Practice.
- In 2012 the Löfstedt Review looked into a number of H&S requirements with a view to reduce over compliance.
- It was claimed that the implied legal requirement concerning maintenance of electrical appliances was being applied ‘too widely & disproportionately’.

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Recent health & safety trends

- Government pressure to reduce the burden of over compliance
- HSE asked to review regulations / amend if necessary

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Löfstedt changes status quo

HSE report that issue is not the Regulations but the way in which they are applied

IET Code of practice 4TH Edition - Nov 2012

HSE guidance for low risk environments

AIM TO ADDRESS "OVER COMPLIANCE"

Reinforcement of the need for RISK BASED APPROACH

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Assessing the risk

- 4th edition IET Code of Practice focuses on the importance of taking a proportionate response to ensure compliance.
- Maintenance regime should be proportionate to the risk
- Highlights the importance of taking a structured approach to risk assessment for the determination of retest periods.
- Risk based assessments are the responsibility of the duty holder.
- Duty holder may enlist the services of a competent person
- Risk assessments should be reviewed regularly

Influencing factors

- The environment
- The users
- The equipment construction
- The type of equipment
- The frequency of use
- Type of installation methods
- Previous records

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Risk assessment

‘A systematic process of evaluating the potential risks that may be involved in a projected activity or undertaking, considering what could go wrong and deciding on suitable control measures to prevent loss, damage or injury in the workplace. An assessment should include any controls required to reduce, minimize or eliminate any risk.’

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Performing a Risk Assessment

1. Potential hazards are recorded
2. Probability of an event is estimated by the assessor
3. Severity of harm is estimated by the assessor
4. Risk is calculated
5. Action is determined

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Who performs portable appliance testing?

- An analysis of the data associated with the purchase of portable appliance testing instrumentation shows that the type of users can be broken down into two groups:
  - Around 65% of users are individual organisations or companies who perform their own in-house testing
  - 35% are contractors (electrical, specialist PAT, facilities management, health & safety etc.) providing a test service on a sub-contract basis.

- Organisations that perform their own tests tend to integrate portable appliance inspection and testing into broader health and safety asset management policies.

Training Requirements

- Identification of equipment and appliance types to determine the test procedures
- Awareness of the risk assessment process for determining the frequency of inspection and testing
- Familiarity with the test instruments and their limitations and restrictions
- Able to fill in records and sign to take responsibility for the work.
- An understanding of how electrical, mechanical or thermal damage can occur to electrical equipment, flexes and plugs and connections

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Training Requirements

- Industry qualifications for in-service inspection and testing of electrical equipment, alone, do not necessarily demonstrate competency.
- Must have an understanding of basic electrical and electronic principles, safe isolation procedures and safe systems of work, which, in some cases, may only be derived from previous knowledge, training and/or experience

Experience

Test operative should have:

- Experience and technical knowledge to perform the inspection and testing without putting him/herself or others at risk
- Technical knowledge or experience may consist of adequate knowledge of electricity and adequate experience of electrical work
- An adequate understanding of the equipment to be worked on and practical experience of that system

Experience

Test operative should:

- Be aware of the hazards that may arise and the precautions that need to be taken
- Be able to recognize at all times whether it is safe for work to continue
- Be prepared to advise on suitability of equipment for the particular location and should be replaced with a more rugged item
- Be prepared to advise on a cost-effective maintenance regime

Rates of test failure

- Number is always likely to be higher during initial test programme.
- Clearly the rate of test failures is likely to decline during subsequent reviews as more potentially defective equipment is routinely identified and rectified..
- average proportion of defects discovered during ‘first time’ appliance testing of a range of electrical equipment was 12%.
- Typical office-based working environments had a failure rate within the range of 0.5% to 1.5%.
- Educational and training establishments the rate was higher at between 0.5% and 3.3%.
- Industrial workplaces was higher still at 1.0% to 24%.

The nature of electrical faults

- A high proportion of appliances that failed an initial visual inspection due to defects in the cable, appliance enclosure or the mains plug.
- 1/3 of those items which failed had defective protective conductors or insulation.
- Originally it was recommended that testing should be carried out in four stages - visual inspection, a test to verify earth continuity, a test to verify insulation and a functional test.
- This has been extended to include variations in applied voltages for insulation testing, changes to earth continuity currents and new requirements in relation to checking cables, leads, and RCD trip times.

The consequences of electrical faults

- There is considerable evidence that faulty electrical appliances continue to post a real threat to people and property.
- 1,000 workforce accidents and 30 fatalities involving electric shock and burns that are reported to the HSE each year.
- Although the HSE is unable to provide detailed data on electricity-related fatalities, accidents and injuries going back 25 years, it seems clear that since the introduction of the EAWR 1989, the incidence of workplace accidents linked to electricity have shown a gradual decline.

The consequences of electrical faults

- Recent figures extracted from RIDDOR4 dating back to 2001/2002, for contact with electricity or electrical discharge.

	Fatalities	Major injuries	3 day injuries	Total
2001/02	7	131	411	549
2002/03	12	127	447	586
2003/04	9	148	379	536
2004/05	4	118	357	479
2005/06	8	105	354	467
2006/07	11	111	359	481
2007/08	9	83	341	433
2009/10	4	93	320	417
2009/10	3	75	282	360
2010/11	7	88	299	394
2011/12	6	106	299	411
2012/13 (p)	2	90	170*	262

Source: HSE Statistics Unit (p) provisional
*The figure for 2012/13 is for 'over 7 day injuries' as a result of a change in reporting requirements

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Workplace fires

- **1989 UK Fire Statistics:**
  - **45,600 fires** in ‘other occupied buildings (non domestic)’ of which **32,400** (71%) were regarded as accidental.
  - Of these accidental fires, the main causes were faulty appliances and leads with **6,800** incidents (21%) and misuse of equipment or appliances with **6,400** fires (20%)

- **2011/12 Fire Statistics Great Britain:**
  - **24,100 fires** in ‘other buildings’ of which **16,800** (70%) were regarded as accidental. The main cause of accidental fires in other buildings was faulty appliances and leads (24%).
  - This represented around **4,000** fires during the year. The misuse of equipment and appliances was responsible for **2,600** accidental fires in 2011-12 (15%).

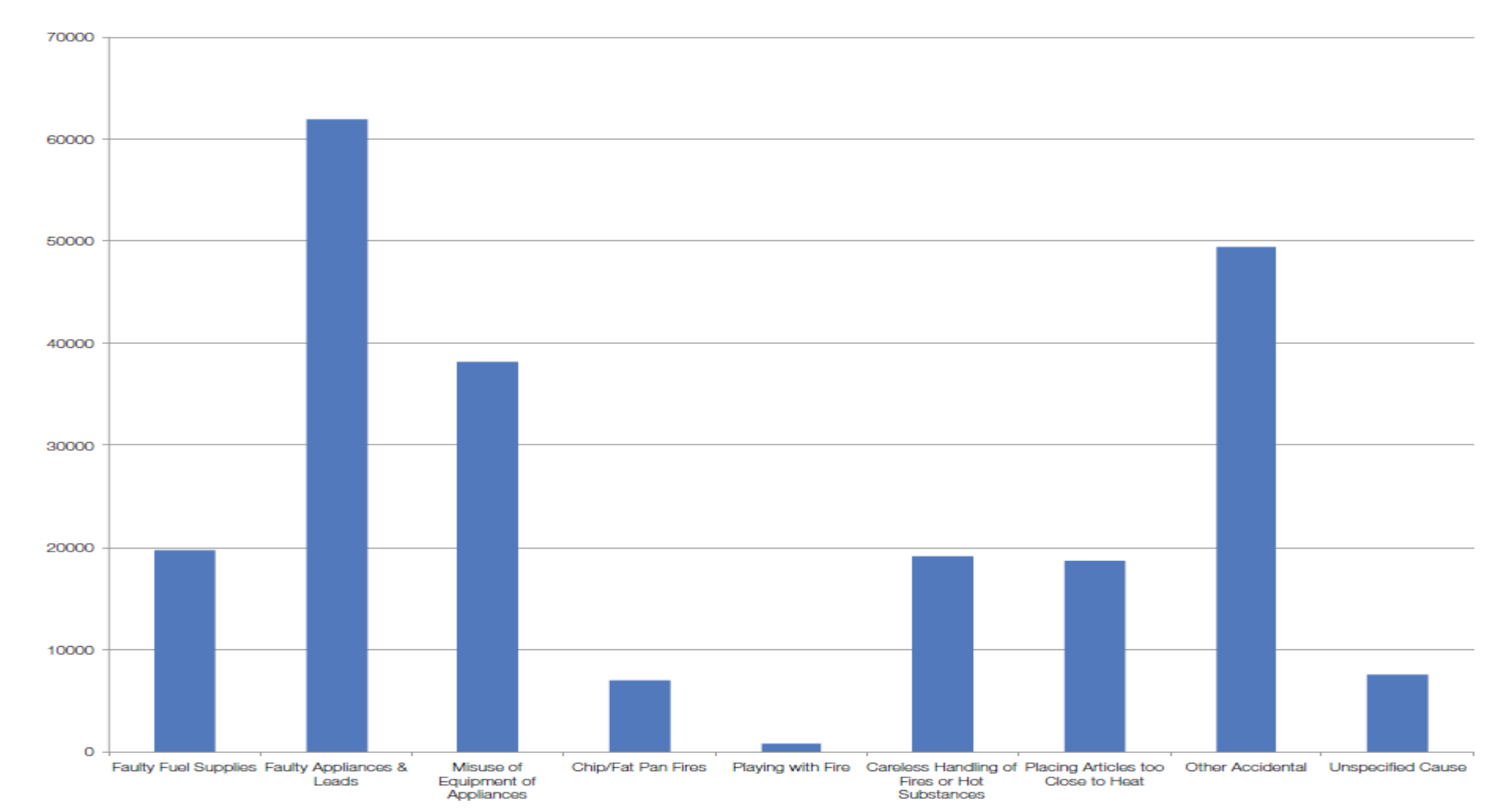
- **Over this 25 year period these figures would appear to show that the incidence of accidental fires in commercial and industrial buildings has reduced significantly.**

Workplace fires

- Included in this overall trend are some interesting facts and figures:
  - The 24,100 fires recorded in ‘other buildings’ during 2011/12 was the lowest for more than a decade.
  - The 4,000 accidental fires in ‘other buildings’ recorded in 2011/12 was a 10% reduction on the previous year and the lowest level in more than a decade.
  - Between 2000/2001 and 2011/12 (excl 2009/10 for which no breakdown is available), each year faulty appliances and leads were identified as the cause of between 24% and 32% of accidental fires in non dwelling type buildings.
  - According to published statistics collated by the Fire Protection Association (FPA)5, between 2000 and 2005, in 346 reported fires that were electrical in origin in business premises, the reported losses totalled over £178 million, with an average loss per incident of over £51,000.

Workplace fires

- Causes of accidental fires in buildings other than dwellings from 2000/2001 to 2011/2012*



*Excludes 2009/10 for which breakdown figures are not available.
From Fire Statistics, Great Britain, www.communities.gov.uk

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Counterfeit electrical goods

- Approximately £30 million of counterfeit electrical products entered the UK market in 2010.
- Counterfeit electrical products include everything from domestic appliances to cables and leads, lighting products, power tools and wiring accessories.
- 15 million counterfeit products have been seized and destroyed in the period 2001 to 2013 – and the number is growing monthly.
- In the UK, Electrical Safety First has campaigned to highlight the risks posed by counterfeit electrical appliances.
- Regular and systematic inspection and testing of electrical appliances used in the workplace provides an effective safeguard against the risks posed by the use of potentially dangerous counterfeit equipment.

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Counterfeit electrical goods

- Even large blue chip global brands are not immune
- In 2013, Apple unveiled a worldwide programme to replace counterfeit power adaptors after a Chinese woman was reported to have been electrocuted whilst using one.
- Ebay (.co.uk) has removed over 1,000 listing for electrical products which have illegal plugs, including over 140 which did not have a fuse.

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Faulty equipment and product recalls

- Genuine products from legitimate sources can sometimes be potentially unsafe and become the subject of product recall notices by manufacturers.
- ESF has warned that millions of potentially dangerous recalled electrical products are thought to remain in use due to a worryingly low recall success rate.
- Average recall success rate is just 10-20%.
- Appliances are mainly used in domestic residential properties - but some of these products are also being used in workplaces, hotels, pubs, restaurants, and similar non-domestic premises.

A common sense approach

- Formal inspection and testing programmes are capable of identifying many situations where defective equipment could have caused electrocution of fire.
- The cost of taking a reasonable approach to inspection and testing can be considerably lower than that associated with other forms of assessing and preventing any health and safety risks
- A basic test instrument, with a training video and test record book, can be purchased for a few hundred pounds. Such a system should have a life of up to 10 years.
- With larger organisations the cost will be proportional to the size and type of industry
- A duty holder can demonstrate compliance with the EAWR 1989 by a variety of means, of which inspection and testing is one, and it is up to the dutyholder to determine how best this can be achieved in relation to the risk posed in their own particular environment.

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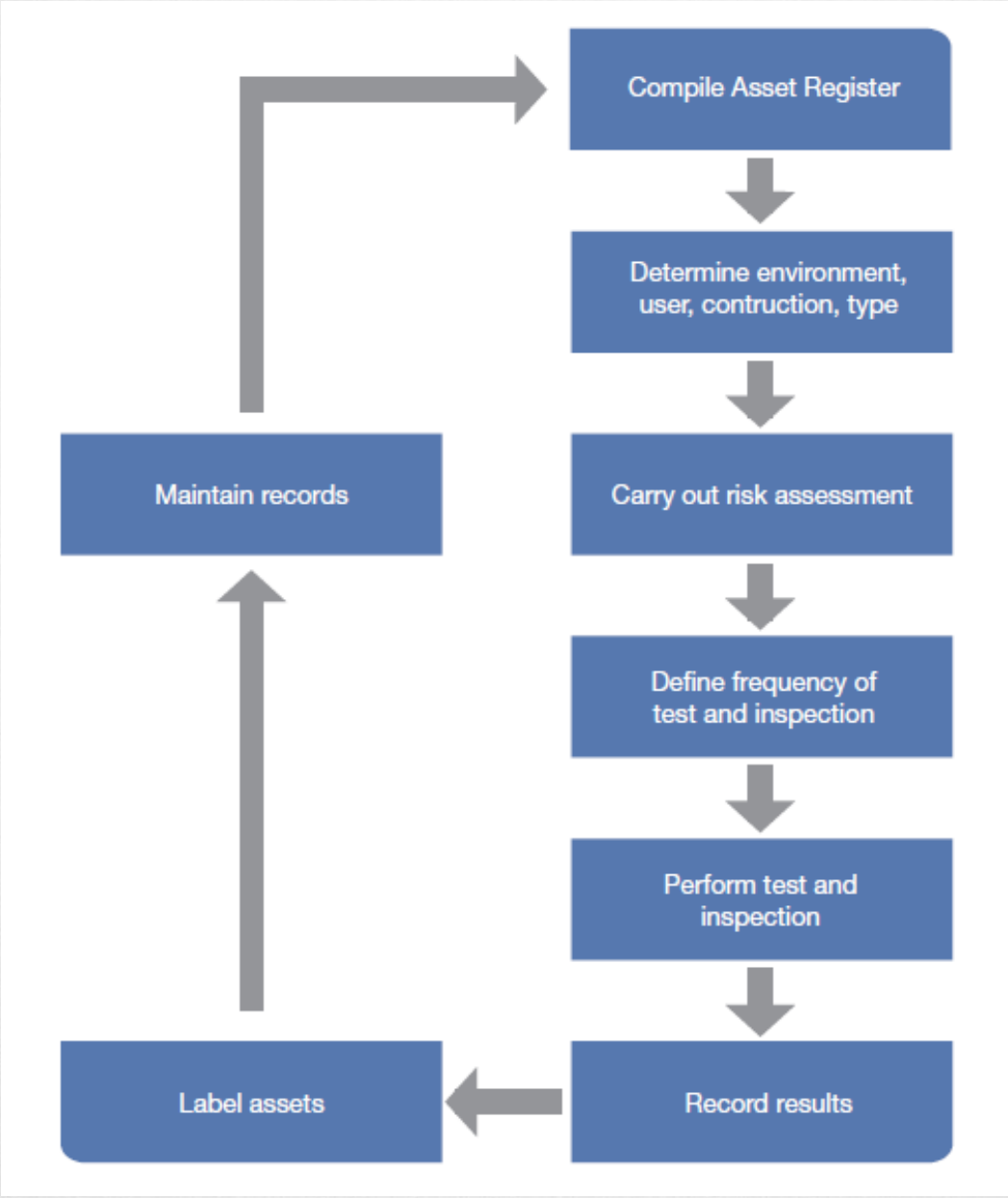
Demonstrating compliance



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Conclusion

- Periodic inspection and testing of portable electrical equipment saves lives and prevents fires.
- It also has an increasingly important role to play in eliminating the risks posed by growing safety problems linked to counterfeit products and inefficient product recall processes.
- EAWR 1989, along with the HSE Memorandum of Guidance and successive IET codes of practice, has consistently provided sound advice based on industry experience and the electrical safety needs of the business community.
- A common sense approach to testing has also been useful in helping to generate a better understanding of portable appliance testing.

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How can Seaward help?

- New instruments for all the requirements of the 4th Edition
- Risk assessment training courses
- Image capture for fully traceable visual inspection and risk assessment
- Fire alarm and emergency lighting reporting & certification
- Comprehensive record management software for complete traceability

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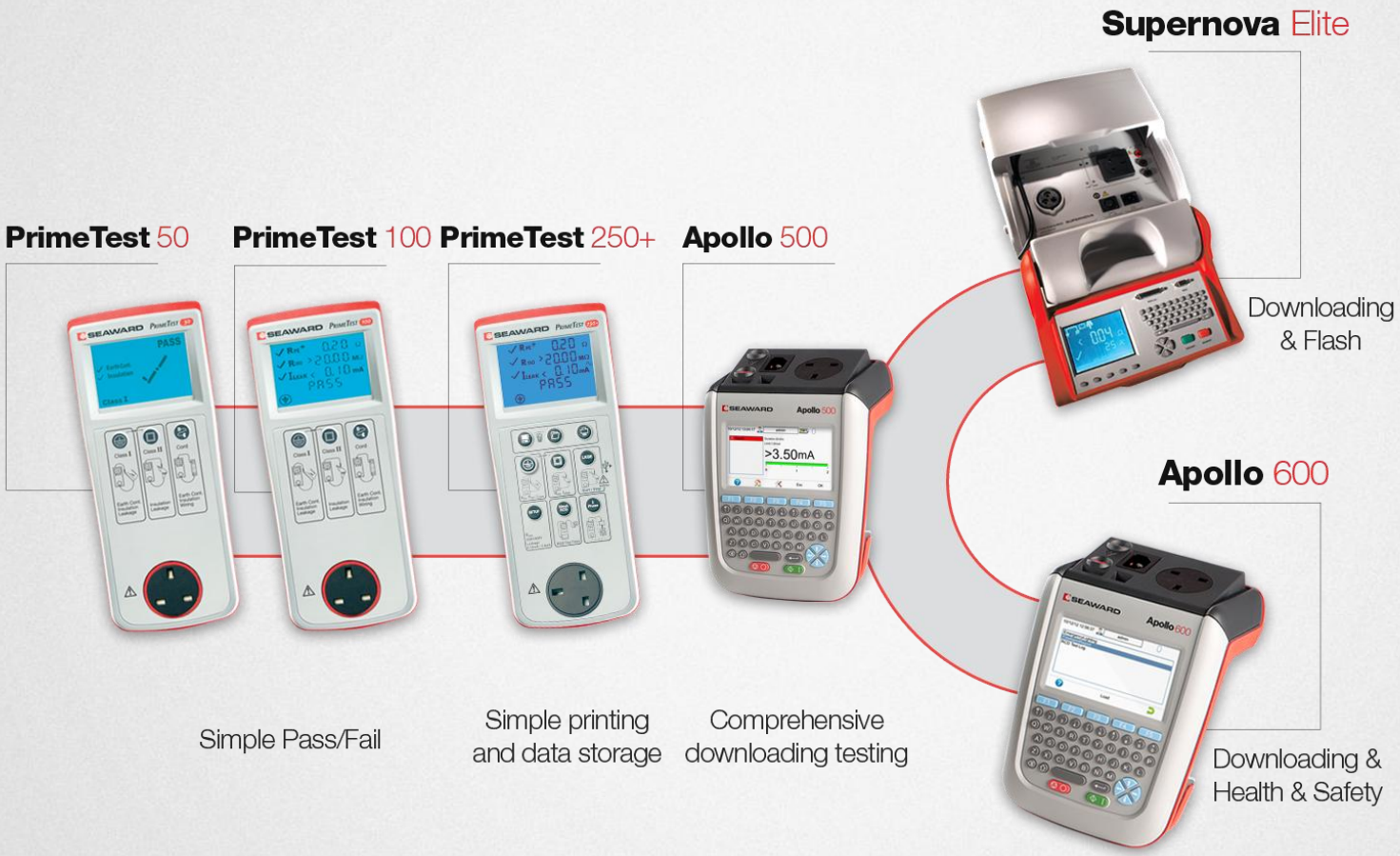
A PATs range to cover all bases



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Download the EAWR white paper from
www.seaward.co.uk/eawr25

And the Guide to PAT Testing from
www.seaward.co.uk/pat-guide

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Thanks for your time

Any questions?

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