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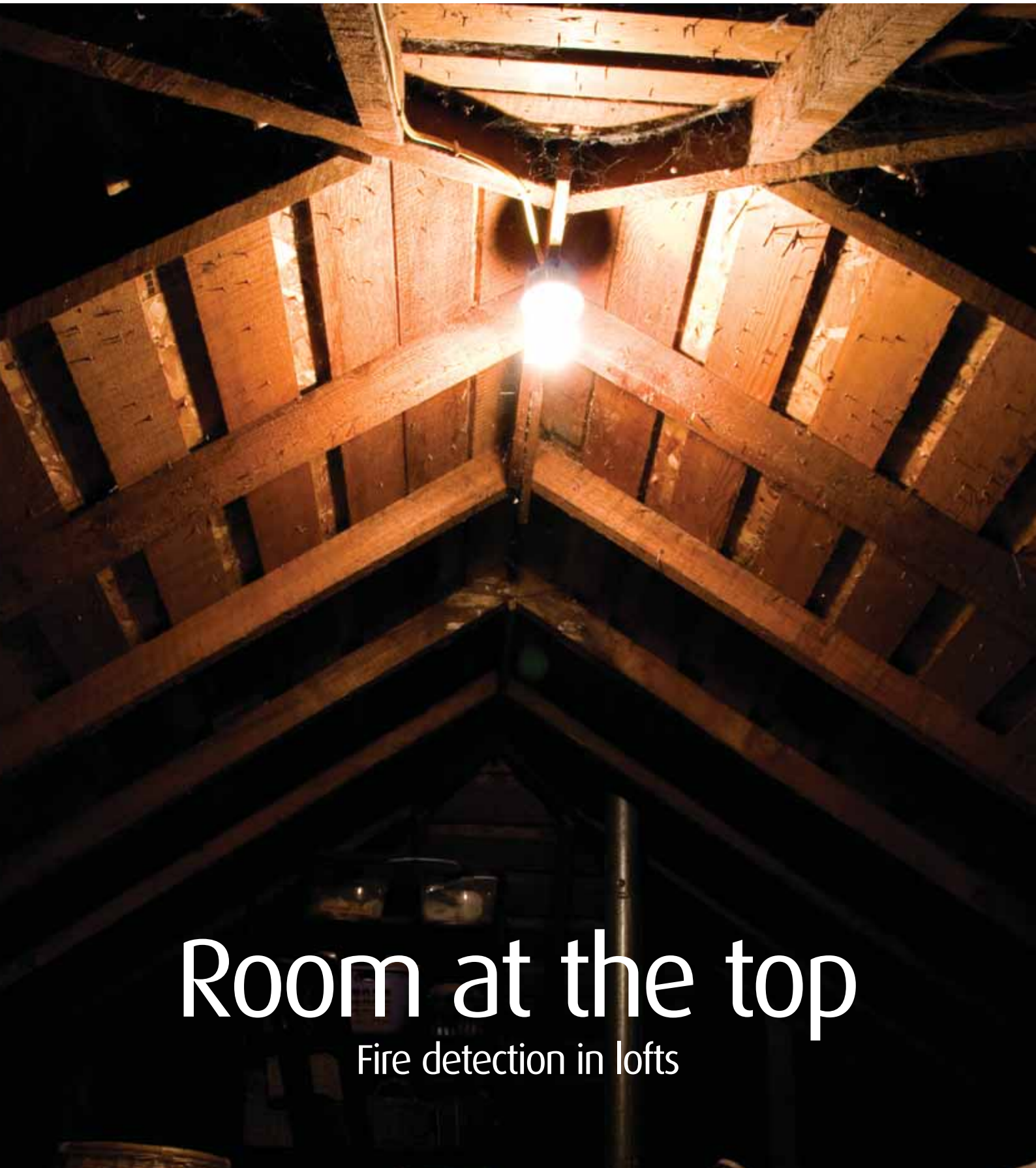
Issue 26 | Autumn 2012 | £5.00

SwitchedOn

News for the industry from **The Electrical Safety Council**

ELECTRICAL SAFETY COUNCIL



Room at the top

Fire detection in lofts

VIEW FROM THE DG'S DESK

I hope that you enjoy this edition of *Switched On*. As you can see from the articles included, the Charity continues to provide a wide range of support to its beneficiaries and continues to work inclusively with its stakeholders and partners.

Underpinning the work we do to help make people safer around electricity is our comprehensive public affairs agenda. By working with politicians on a cross-party basis, and with key civil servants in Government departments such as Communities and Local Government (DCLG), the Electrical Safety Council has been able to influence the policy decisions that could impact on electrical safety.

Tackling the complexities of the UK's political landscape can, for any organisation, seem to be an enormous, if not impossible, undertaking. The outcomes of a public affairs agenda can be uncertain to predict and the time needed to achieve anything meaningful can be difficult to ascertain.

For a niche charity we have been assiduous and agile in pursuing our public affairs strategy. We recognise that campaigning in areas of risk is as important as seeking to influence legislative and regulatory changes that could impact Government policy on electrical safety.

One such example of our work to inform Government opinion was on the review of *Part P*. Working with a number of key stakeholders, including the NICEIC and ECA, we were able to offer an informed view on the review of this important part of the Building Regulations. Our efforts also included hosting a fringe event at each of the Party Conferences. This resulted in a DCLG select committee making recommendations to the Minister for Building Regulations that *Part P* should not be culled as part of his Department's review of Building Regulations. In the Government's response to the Select Committee's report, ESC was acknowledged as an organisation that could act as a conduit to raise awareness amongst the public of the importance of *Part P*.

We are also gaining traction in Scotland and Wales where we are now in direct dialogue with MSPs and AMs respectively. This is helping us to support electrical safety initiatives in the private rented sector and to raise awareness more generally among the key influencers that can bring about real change in the behaviour of people when using electricity and raise the standards of electrical installation in privately rented properties.

Our efforts have not gone unnoticed and while we welcome support from politicians and stakeholders on taking forward the safety agenda that forms the core of our strategy, there is a risk that the space we occupy will become overcrowded if self-interests are allowed to drown out the key messages that we are trying to promote for all users of electricity. The ESC is aware that well-intentioned efforts to bring together interested parties can create "talking shops", which become self-fulfilling but have no direct impact on the real issues that we are trying to tackle and therefore deliver no tangible outcomes.

Aware of this risk, we will be seeking to maintain our policy of engagement with politicians and decision makers but not at the expense of delivering the electrical safety agenda that we have committed to.

As always, we would welcome feedback on *Switched On*, to help us improve the content. Email **feedback@esc.org.uk**

Phil Buckle Director General

Council investigates new measures to ensure safety when charging electric vehicles - Page 13

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your insight into the electrical safety industry

news

technical

Letters

I'm sure that there are many within the electrical industry that will have strong feelings about some of the issues raised in *Switched On*. So feel free to shout about them.

Please email your letters to the **Editor** of *Switched On* at: **andrewbrister@ymail.com**

ELECTRICAL SAFETY COUNCIL

features

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IN BRIEF

Metal theft – BMRA on the lookout for protective conductors

In response to concerns raised by the Electrical Safety Council over stolen cable, the British Metals Recycling Association (BMRA) has asked its members to be on the lookout for persons attempting to sell lengths of single core protective conductors, including short lengths of stripped cable, and to contact their local police if they are suspicious.

For further information, visit www.recyclemetals.org/stolen

ESC's Safe Isolation app now available for Android devices

As reported in the previous issue of *Switched On*, the Council has developed and launched an app on the subject of safe isolation. The app is aimed at anyone who carries out electrical work that requires a circuit or circuits to be isolated in order for the work to be carried out safely.

The original app was suitable for use on Apple devices only but, due to popular demand, a version for Android devices has now been developed. As of mid-June of this year, there had been more than 1,500 downloads so, with the app now being available for use on other types of smart phone and communication devices, many more people will have the opportunity to benefit from using the app.

As is the case for the Apple version of the app, the Android version is available for download in the industry guidance section of the ESC website. Click on "safe isolation", where there is a link to the app in Google Play.

New guidance on electric gates

The tragic deaths of two young children who were crushed by electric gates in separate incidents two years ago has led to new guidance on powered gate safety.

The guidance, endorsed by the Health and Safety Executive, has been produced by the Door and Hardware Federation (DHF) and is available free to download at: **www.dhfonline.org.uk/downloads/pub193.pdf**

The guide aims to help industry meet its obligations by providing a summary of the current legislation and standards.

A six-year-old girl died when she was crushed by electric gates in Manchester in 2010. A few days later, another girl, aged five, was also crushed to death by electric gates in Bridgend, South Wales.

Following those tragic accidents, the ESC highlighted the dangers of electric gates in the autumn 2010 issue of *Switched On* (which can be freely downloaded from the industry section of the Council's website at **www.esc.org.uk**).

ESC EXHIBITS AT THE FIRST ELEX SHOW IN MANCHESTER AT EVENTCITY

The ESC once again exhibited at the Elex show, the first one to take place at Manchester's new EventCity venue. EventCity is the second largest exhibition space outside London and offers all the benefits of being located next to Manchester's Trafford Centre.

The ESC was on hand to provide best practice guidance to visitors and answer a range of questions. The Council's Best Practice Guides (normally download only) were available on the stand and, as always, were extremely popular. There are currently eight in the series, on a range of topics including replacing a consumer unit in domestic premises, guidance on safe isolation procedures and accuracy of test instruments. These Best Practice Guides are used extensively by the industry and downloads from the ESC's website alone amount to 65,000 each year.

In addition, a range of ESC leaflets were available for contractors to use to provide guidance to their customers on common topics such as why earthing and bonding need to be checked, the benefits of having RCD protection and the rules and requirements surrounding *Part P*.

Visitors to the show were also welcome to attend the Industry Forum hosted by the ESC and the IET. The forum brings together experts from ELECSA, ECA, NAPIT and NICEIC, and discusses topics relating to developments within the industry and answers questions on specific areas of the Wiring Regulations.

Held over two days, the two topics discussed at the forum were:

- testing an electrical installation and understanding your responsibilities;
- working with the new Electrical Installation Condition Reports.

With a technical Q&A session in the second half of the forum there was something for everyone, especially those lucky enough to win a printed copy of *BS 7671: 2008 (2011)* courtesy of the IET and a year's subscription to the ESC's online *Essential Guide to the Wiring Regulations*.

The Council looks forward to meeting some more *Switched On* readers at the next Elex in Coventry on 20-21 September. Log on to **www.elexshow.info** to register for free.

LACK OF ELECTRICAL SAFETY ACTION AMONG NESTING PARENTS PUTS CHILDREN AT RISK

New parents and parents of young children are putting their families' lives at risk when preparing the home for children through unsafe DIY, common blunders and an over-reliance on socket covers.

These are the stark findings of a new study carried out by the Electrical Safety Council and in July the ESC launched a media campaign targeting new parents and parents of young children.

The study found that 62% of parents use socket covers, more than any other safety product, including baby monitors and stair barriers. However, the use of covers will not prevent an electric shock if the installation is not safe. Although the use of socket covers highlights an obvious concern for electrical safety among new parents, regular sockets are generally safe and other areas were not being addressed.

For example, the study highlighted the fact that only 38% of new parents' homes have adequate RCD protection, well below the national average (50%). Despite this, three-quarters of new parents felt that they had taken appropriate steps to secure the safety of their children.

The lack of RCD protection is particularly worrying as two-thirds of new parents (67%) undertake DIY in preparation for their child, with 45% drilling into walls or using mains-powered tools. Almost a fifth of young parents (17%) admitted to attempting DIY without being confident of electrical safety.

The study also revealed a lack of awareness of basic electrical hazards in the home:

- 50% did not clear cables, which could cause tripping or strangulation
- one in ten admitted to knowingly using a faulty plug in the home
- only a third (32%) checked plugs or wires for scorch marks or fraying in the last year
- nearly half (47%) used electrical items dangerously close to water.

The ESC's campaign carries the message that the only way parents can protect their children from fatal electric shock and reduce the risk of fire is by having RCD protection – ideally in the fusebox, or as a plug-in. It encourages parents to download the free Home Electrical Safety Check app, which allows anyone to do a quick, visual check of the home to make sure it is electrically safe. It also calls on product manufacturers and parenting advice outlets to offer parents key electrical safety advice, rather than offering socket covers as a one-stop solution.

Meg Mathews: victim of an electrical fire

The campaign is supported by celebrity mum, Meg Matthews, herself the victim of an electrical fire that had a devastating effect on her and her young daughter. Meg said: *"The fire that destroyed my home last year was one of the scariest experiences of my life. Many people just don't understand how dangerous electricity can be. We learnt the hard way, but parents can protect their children and homes now by installing an RCD and downloading the ESC's free app. I'm urging all parents to take action now – it could save you or your child's life."*

The campaign was covered in national and regional media – with a live slot on ITV's *Daybreak* programme and interviews with the ESC's director general Phil Buckle and Meg Matthews broadcast on stations including 13 BBC local radio stations. The story also appeared on ITV Wales and was covered on ITV News online.

For more on the campaign visit **www.esc.org.uk/childsafety**

Home Impro

The Electrical Safety Council recently held two ceremonies to celebrate the awards made to organisations that successfully applied for funding from the ESC's Electrical Fire Safety Fund and Home Improvements Grants Scheme. One was held in London for partners in England and Wales; and the other in Glasgow for partners in Scotland and Northern Ireland. Bob Doris, Glasgow MSP and member of the SNP, gave a keynote speech at the Scottish event, reflecting his strong interest in safety issues relating to private landlords.

Interest was again high this year, with 210 applications received for the two funding programmes. Of those applications, 62 UK-wide organisations were successful and have shared a total of £240,000 between them. In all, 33 partners will receive a share of £140,000 through the ESC's Electrical Fire Safety Fund; and £100,000 will be shared between 29 partners through the Home Improvements Grants Scheme. Applicants come from across the UK: 37 of this year's funded partners are based in England; 16 in Scotland; 7 in Wales; and 2 in Northern Ireland. The map on page 8 identifies the locations of successful applicants.

The ESC's funding schemes, now in their fourth year in this format, are run as part of the Council's commitment to tackling the safety issues associated with electricity. Funding for the Electrical Fire Safety Fund has been made available to community safety services, including Trading Standards teams and Fire &

Partners announced for this year's **Electrical Fire Safety Fund** and **ovement Grants Scheme**

Rescue Services, to deliver fire prevention initiatives at local level that aim to tackle effectively the causes of electrically-related fires.

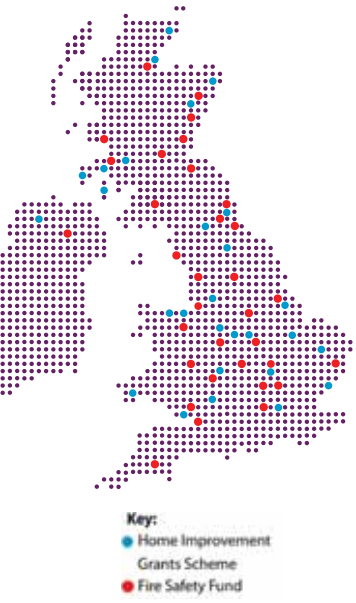
They will deliver projects that include product testing, replacement and market surveillance programmes, as well as raising awareness of electrical safety issues.

Funding for the ESC's Grants Scheme was made available to Home Improvement and Care and Repair agencies across the UK. Finance will improve electrical safety by enabling agencies to provide direct support to older vulnerable and younger disabled homeowners who need to have essential minor electrical works carried out.

Projects will run until the end of March 2013. For further details and information on all of the Electrical Fire Safety Fund and Grants Scheme partners, please visit the ESC website at: www.esc.org.uk/stakeholder/news-and-campaigns.

Last year, £240,000 of funding was awarded to 64 partners UK-wide. A summary of key achievements of their activities is provided in the box overleaf.

There was a diverse range of projects funded within the Electrical Fire Safety Fund, which included testing electrical appliances, resulting in a number of unsafe appliances being removed from use and replaced, as well as a number of activities aimed at raising awareness of electrical safety issues.



Highlights and achievements from funded partners in 2011-12

A total of £240,000 was distributed between 64 partners UK-wide through the ESC's Electrical Fire Safety Fund and Grants Scheme. The range of projects delivered by funded partners included product testing and replacement programmes, awareness-raising activities and minor electrical works carried out in the homes of vulnerable people.

Funding directly benefited over 53,000 people through attendance at awareness events and distribution of safety material and equipment, electrical appliances being tested and replaced where necessary, and essential minor electrical work carried out.

As a result of these activities, achievements included:

897 unsafe products were removed from use as a result of 3400 electrical products tested

352 vulnerable people had essential minor electrical work carried out

698,000 people were reached through a range of co-ordinated activities, such as distribution of safety literature and events

3.4m people reached through co-ordinated media activity

Case study: Aberdeen Care & Repair

One of the Council's 2011-12 funded partners, Aberdeen Care & Repair, was contacted by an elderly gentleman after he received a minor shock as one of his wall lights stopped working. He is the main carer for his wife, who has suffered a stroke. The couple live in a terraced house, built in the 1960s. On inspection, the electrician sent to the property found that the light had been wired unsafely into the adjacent socket. He also discovered that one of the ceiling lights in the hall had exposed bare wires, the consumer unit needed upgrading and several sockets were in poor condition, all of which posed a serious risk of fire.

The electrician discovered that the lights were dangerously wired from a 32A socket circuit. He carried out a periodic inspection of the property and then completed the work required to make it safe. This work, which cost £750, was paid for by a £500 grant from the ESC Grant Scheme, with the balance of £250 coming from Aberdeen Care & Repair's own Hardship Fund.

At the same time, Care & Repair was also able to install a level access shower with the support of the occupational therapist and grant funding from the local authority. Without the necessary electrical upgrades, this additional work could not have been carried out.

The improvements to the property have allowed the couple to continue living independently at home in safety and security.

ESC APPEARS ON BBC'S FAKE BRITAIN

A programme in the BBC's *Fake Britain* series featured a raid on a distributor suspected of dealing in counterfeit and substandard electrical goods. The raid was carried out by Birmingham Trading Standards, accompanied by members of the ESC technical team.

The successful raid resulted in the seizure of over 2000 suspected sub-standard chargers and counterfeit electrical products. Of the products seized, the ESC selected several chargers and a number of leads fitted with *BS 1363* plugs for testing to show the dangers that such products can pose to users.

On closer inspection, all of the plugs had been fitted with counterfeit fuse links – evident by incorrect markings and absence of the sand filler that is required for arc extinguishing.

Each plug was subjected to a high current test representative of a short-circuit fault condition, which a genuine fuse complying with the requirements of the product standard *BS 1362* would have been able to protect against. As expected, the counterfeit fuses failed the test – some in a spectacular and dangerous way, with flames emitted from the exploding plug and damage being caused to the socket-outlet. If the simulated incident had occurred in a household it could have led to a fire or, worse still, could have seriously injured someone.

The Council encourages everyone to only buy electrical appliances and electrical products from a reputable retailer. Also, when buying a replacement charger it is essential to check that they are properly packaged with instructions for use, have the manufacturer or importer's address and are marked with the manufacturer's name or recognised brand symbol. Further guidance on what to look for when buying a charger and guidance for buying electrical goods online can be found in the public section of the ESC's website: **www.esc.org.uk/public/guides-and-advice/leaflets.**

At the time of writing the Council is seeking the BBC's permission to use the video of the testing on its website but in the meantime, the ESC's own footage is available for viewing in the public section of its website: **www.esc.org.uk/public/guides-and-advice/checking-a-plug/testing-sub-standard-plugs**

COUNCIL WORKS ALONGSIDE ELECTRICIANS TO ACHIEVE SAFER HOMES

The ESC has developed an information pack for electricians to work in partnership towards the creation of safer homes. The pack includes the importance of regular condition reporting and the benefits of RCD protection.

Last year over 400,000 consumer units were replaced in the UK – an indication that householders are taking steps to upgrade their fusebox to a modern one offering them greater protection. Nevertheless, over 13 million homes remain without adequate RCD protection.

The Electrical Safety Council is acutely aware that electricians play a very important role in improving safety in UK homes. In fact, as reported elsewhere in this publication (page 11), electricians represent a trusted voice and householders are likely to act on their advice.

Last year electricians helped the Charity to reach close to two million consumers with information about RCD protection. And electricians have told the ESC that they have found the free pack from the Council extremely effective in facilitating discussions with customers about RCD protection. In many cases, customers go on to upgrade their electrics.

To help even more, the ESC has developed an information pack for electricians to promote the benefits of regular condition reporting and RCD protection. The kit includes a range of materials, including:

- an informative downloadable PDF to attach to emails, quotations and invoices;
- artwork and illustrations;
- relevant statistical data on accidents and fires;
- an example template press release;
- a downloadable web banner promoting the ESC's free electrical Home Safety Check app;

You can access the various material at **www.esc.org.uk/industry**

BRITISH STANDARDS COMMITTEES NO LONGER PERMITTED TO INTERPRET OR CLARIFY REQUIREMENTS

A new British Standard has been introduced that dictates that committees responsible for the development of standards will no longer be permitted to interpret or clarify requirements.

BS 0: 2011: A Standard for Standards came into effect in January this year. Since that time, committees responsible for British Standards, including *BS 7671: Requirements for Electrical Installations*, have not been permitted to provide on request any interpretation or clarification of the requirements of those standards, as was the practice previously.

BS 0 now states that: *"Responsibility for interpreting a standard rests with its user, informed where necessary by appropriate expert advice. Ultimately, the only body with the power to give a definitive interpretation is a court of law. BSI does not offer individual interpretations of standards."*

However, if notified of any ambiguities, inconsistencies or possible errors in a standard, BSI will refer them to the committee responsible for that standard for consideration, together with any proposals for changes or improvements. Such notifications are encouraged by BSI as a contribution to the maintenance of a standard.

The change in BSI policy regarding interpretations gives increased significance to the role of the Electrical Installation Forum (see below), which is well placed to provide interpretations and clarifications of the requirements of *BS 7671*.

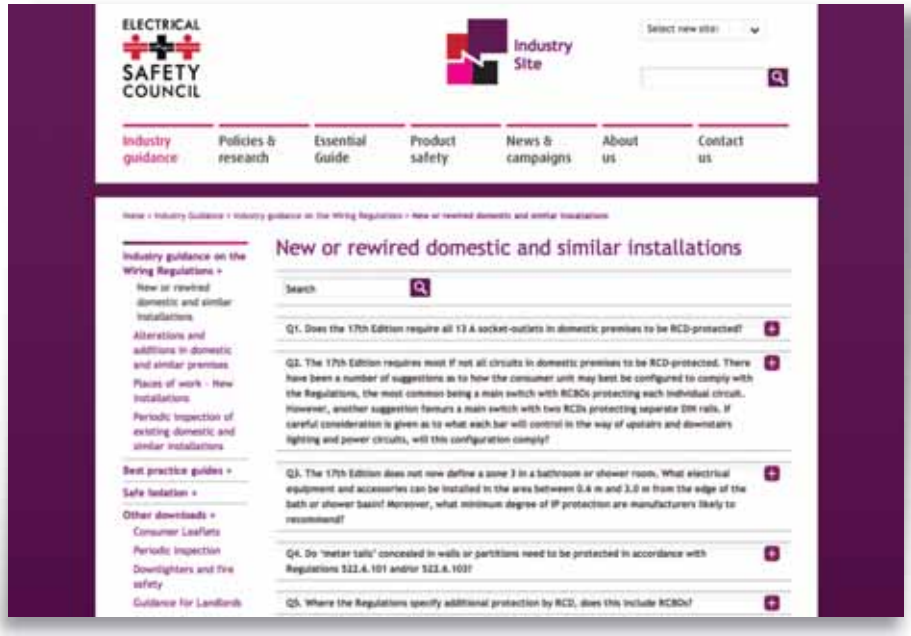
However, it should be noted that the Forum is not able to respond directly to technical questions from individuals. Electrical contractors and installers seeking technical advice on the application of the requirements of the *17th Edition* (as amended) should, in the first instance, contact their registration or trade body.

If the registration or trade body wishes to establish a consensus of opinion on the matter, they may refer it to the Forum for consideration. If the Forum is able to agree on an appropriate answer, it will be published on the Forum's website, which can be found at **www.esc.org.uk/forum**

INDUSTRY GUIDANCE ON THE WIRING REGULATIONS – MORE QUESTIONS ANSWERED

The agreed answers to several new questions have been added to the 'Industry guidance on the Wiring Regulations' section of the ESC website, including:

- Are the relevant tests of Regulations 612.2 to 612.13, for example continuity of protective conductors, insulation resistance and earth fault loop impedance, applicable to parts of systems such as room and cylinder thermostats, motorized valves and programmers?
- A water utility service enters an apartment block in plastic and then metal branches feed individual apartments. To which location(s) should main protective bonding be provided?
- Do blanks fitted in a distribution board or consumer unit that can be removed without the use of a tool or key comply with the requirements of *BS 7671* with regard to access to live parts?
- A number of companies specialising in periodic inspection and testing are offering 'visual only' periodic inspections (also called 'visual condition reports'). As no testing is undertaken, where would the use of such 'visual only' inspections be appropriate?



For the industry-agreed answers to these and many other commonly-asked questions relating to the application of the *17th Edition* as amended, please visit **www.esc.org.uk/forum**

The ESC recommends that those following the guidance provided by the Electrical Installation Forum visit the site at least every couple of months to see what other additions and amendments have been made.

ESC SURVEY FINDS MORE HOUSEHOLDERS USING REGISTERED ELECTRICIANS

While more householders are aware of the importance of using a registered electrician, many still find the costs of equipment upgrades a barrier to improved electrical safety in the home.

Every year the Charity conducts research into people's attitudes and behaviours towards electrical safety issues in the home. This year's results showed that despite a growing understanding of the importance of RCD protection, with 36% of people able to correctly describe an RCD (compared to 30% in 2011), there is still a failure to act on this understanding – with the associated costs of upgrading a consumer unit a barrier.

Alarmingly, 7% of people who frequently use electrical equipment for DIY or in the garden have RCD protection but never use it, showing that there is work to be done amongst all levels of users to move them from awareness to action.

Electricians are still seen as the best source of safety advice, but a fifth of people (21%) will still turn to friends and family members for advice on electrical safety. Importantly, of the respondents who had used an electrician in the last 12 months, 74% had used one accredited with a scheme operator, an increase of 1% from last year.

For the first time this year the Council asked people whether they were carrying out basic visual checks in the home, including making sure sockets were not overloaded or damaged. The study showed that a third of people are not carrying out any checks at all, with tenants significantly less likely to check than homeowners. This is in line with previous research that showed that tenants felt electrical safety was the responsibility of their landlord.

Nearly three quarters of landlords have had a periodic inspection carried out in their properties; with two-thirds (63%) saying this is to fulfil their obligation for maintaining the safety of the installation. Although this is a high figure, it does leave a quarter of landlords not looking after the electrical installation in their property – despite their tenants feeling it is their responsibility.

As well as highlighting the financial barriers, the Council recognises that there is still work to be done to make the messaging around RCD protection clearer and a need to stress the potential cost of not looking after electrical safety in the home.

The results provide useful insights which will be used to support the ESC's campaigning activity over the next 12 months. Initiatives will target groups including homeowners, landlords, tenants, amateur DIY enthusiasts and professional electricians.

ESC TO PRESENT ON SOCIAL MEDIA AT ICPHSO CONFERENCE IN BRUSSELS

The Council will be presenting at the International Consumer Product Health and Safety Organisation (ICPHSO) symposium, to be held in Brussels on 16 -17 October. The theme for the event is: Setting the agenda for international collaboration; the ESC will be giving a presentation on how social media can help to deliver unsafe product alerts (or safety warnings) and can help improve product recall effectiveness.

The intention is to show how regulatory bodies and manufacturers are increasingly using social media platforms, such as Facebook, Twitter and social forums, to communicate with the public in the event of an unsafe product being identified. The presentation will include case studies, drawing on experiences from Australia, USA and the UK.

It is hoped that the session will help to generate ideas for developing best practice guidance for using social media as a tool to support product safety market surveillance strategies.

More information on the ICPHSO symposium, including how to register for the event can be found on the web: **www.icphso.org/conference/2012brussels**

SCOTLAND SET TO SHAKE UP GOVERNANCE OF PRIVATE RENTED SECTOR

The Scottish Parliament is to consult over new proposals designed to achieve more secure tenancies, greater consumer empowerment and better protection for tenants from unscrupulous landlords.

Since devolution mandated the creation of the Scottish Parliament in 1997, successive Scottish Governments have made their mark on various issues, from tuition fees to social care, by forging a different path to the one pursued in England. Now the Private Rented Sector (PRS) is to follow that trend, with new plans north of the border set to differentiate the way that housing is regulated from the rest of the UK.

The PRS Scotland Strategy is, in the words of Housing Minister Keith Brown MSP, designed to "create a private rented sector in Scotland that offers accommodation of a high standard, both in terms of physical condition and management". It will do this by outlining plans for more secure tenancies, greater consumer empowerment and better protection for tenants from unscrupulous landlords.

With some researchers predicting that over 25% of people will be living in the private rented sector by the 2020s, and headlines about a lack of decent and affordable homes surfacing on an almost weekly basis, it is a timely intervention. Furthermore, the 2010 Scottish House Condition Survey found that 67% of privately-rented dwellings showed disrepair to critical elements (which presumably in some cases includes electrical installations), while 3 in 10 were found to be in extreme disrepair. It is clear that there is some room for improvement of physical conditions off the back of the strategy.

Perhaps with these figures in mind, the consultation included specific questions on improving quality in the sector, which the ESC seized as an opportunity to set out the ways it believes electrical safety standards can be upgraded:

- ensuring the proposed new Tenant Information Pack (TIP) provides tenants with information about the age, condition and last inspection of the electrical installation and appliances in properties they are moving into;
- requiring that PRS properties attain the same standards of safety as required for social housing through the Scottish Housing Quality Survey (SHQS), and setting a deadline for when the sector must meet this;
- making the Repairing Standard more explicit in terms of the condition electrical installations and appliances should be in.

This consultation is not the only one that Scotland is carrying out on housing, with the Cabinet Secretary for Infrastructure and Capital Investment recently launching Homes That Don't Cost the Earth, another document which has improvements in safety as well as sustainability at its core.

The ESC will be responding to this exercise in due course and we will post updates in future editions of *Switched On*.

COUNCIL BUILDS RELATIONSHIPS AT SPARKS EXPO

The Electrical Safety Council is working to build closer relationships with the electricians of tomorrow and spoke to many of them at the recent Sparks Expo in Bolton.

The Council's senior engineer Gary Gundry and communications executive Jamie Smith represented the ESC at the event at the Bolton's Reebok football stadium, which was well attended by apprentice electricians and their lecturers.

The aim of attendance at the exhibition was to raise awareness of the work that the ESC does and the resources it has to offer electricians throughout their careers. Many apprentices were interested in the information and guidance available and took away copies of the leaflets on display. In return, the apprentices were required to answer a question about RCDs which helped to facilitate discussions with them about matters of electrical safety.

The Council's senior engineer Gary Gundry gave two seminars.

Raising awareness of Council resources to lecturers was also key, with many lecturers very complimentary about the ESC's publications, including *Switched On* magazine, *Essential Guide to the Wiring Regulations* and its various Best Practice Guides.

Gary Gundry (pictured) gave two seminars on how to safely isolate electrical installations; these were attended by around 50 apprentices over the two days. At the seminars, lock-out kits were handed out to apprentices who contributed and showed an interest in the subject matter. The aim of the seminars was to assure young apprentices that following safe isolation procedures is not only essential for them but important for the safety of their future customers.

COUNCIL INVESTIGATES NEW MEASURES TO ENSURE SAFETY WHEN CHARGING ELECTRIC VEHICLES

With the likelihood that the use of plug-in electric vehicles is to become more widespread, the Electrical Safety Council, along with several others in the electrical industry, has raised concerns about the safety risk to persons where vehicles are to be connected to installations relying on protective multiple earthing (PME).

In these type of installations there is a risk of electric shock if the combined neutral and earth conductor in the distribution system becomes disconnected; for example due to a fault or through metal theft.

As well as contributing to the regulations for electric vehicle charging that are being developed for the next revision to *BS 7671: Requirements for electrical installations*, the ESC is investigating the use of a type of voltage-operated circuit-breaker as a means of automatically disconnecting the supply and protective conductor connections to an electric vehicle in the event of a discontinuity in the supply PEN conductor. The intention is to demonstrate that a protective device of this type could be used as one of the alternatives to changing the earthing arrangement for the installation (or part of) to a TT earthing arrangement.

The investigation is at an early stage but the Council intends to provide an update on how it is progressing in a future issue of *Switched On*.

Fire detection in the lofts of domestic premises

One of the considerations when designing a fire alarm system for domestic premises is whether to include fire detection in the loft. This article looks into the need for fire detection in lofts, and at the choice and siting of a detector.

Given the ever-reducing dimensions of the living space being provided in typical domestic premises, lofts are increasingly used to house equipment such as central heating boilers, inverters of solar photovoltaic systems and aerial boosters.

Lofts are frequently also used for the storage of combustible items. Fires can occur as a result of such items being placed too close to heat-producing equipment. Stored materials can also provide a ready source of fuel that will allow a fire to become rapidly established in a loft.

"The need for fire detectors in lofts might also be indicated by a fire risk assessment of a particular building, such as one with a thatched roof"

The case for fire detectors in lofts

Annex A of BS 5839-6 (the code of practice for fire alarm systems in dwellings) gives information on fire risk assessment. When assessing whether fire detectors are required in any particular part of a dwelling, it is necessary to consider (amongst other things):

- the probability of a fire occurring in each room or other part of the premises, and;
- the probability of any fire being discovered before significant spread occurs.

(Paragraph A.7.4 of *Annex A* refers).

The second factor above is particularly relevant to any need for fire detectors in lofts.

Installing fire detectors in lofts containing potential sources of ignition may be justifiable in order to provide early warning of fire to occupants, giving them vital time to evacuate the building and summon the Fire and Rescue Service. Damage to property due to fire and/or smoke could also be minimised.

The need for fire detectors in lofts might also be indicated by a fire risk assessment of a particular building, such as one with a thatched roof.

Where a Category LD1 fire alarm system is to be installed (a system with fire detectors in circulation areas and all rooms or areas where fire might start except toilets, bathrooms or shower rooms), clause 11.1.1 of *BS 5839 6: 2004* recommends that a fire detector should be sited in the roof void. The only exception is where it has been confirmed that no significant ignition sources are present and no combustible items are stored.

Information on how rapidly fire spread can affect building stability is given in *Best Practice Guide No 5: Electrical installations and their impact on the fire performance of buildings*, produced by the Electrical Safety Council with the support and help of leading industry bodies. This is available as a free download from **www.esc.org.uk**.

Choice of detector

Fire alarm systems in dwellings may include smoke detectors and/or heat detectors. Carbon monoxide fire detectors are available but their use in dwellings is uncommon. (Carbon monoxide fire detectors should not be confused with carbon monoxide warning detectors, which are used for detecting carbon

monoxide in the air from incomplete combustion within a fuel-burning appliance.)

No one type of fire detector is suitable for all applications. The final choice of detector will depend on, amongst other things:

- the speed of response needed to provide safe evacuation of the building;
- the nature of the fire hazard;
- the suitability for the environment, and;
- the need to minimise false alarms.

Smoke detectors generally respond appreciably faster than heat detectors to most types of fire but are likely to give false alarms where significant quantities of dust can enter the detection chamber.

Where a smoke detector is installed in a dusty space, such as a loft, clause 12.1 of *BS 5839-6: 2004* recommends the use of an ionisation type as opposed to an optical type, to minimise the likelihood of false alarms.

For thatched dwellings, a domestic mains and battery powered, interlinked smoke alarm system with one smoke alarm sited in the roof void is recommended in *The Dorset Model – Thatched Buildings*, published by Dorset Building Control Technical Committee. This is available as a free download from **www.dorsetforyou.com/media.jsp?mediaid=167640&filetype=pdf**

Siting of detectors

In all cases, the manufacturer's instructions should be followed when siting fire detectors. Detectors must be positioned so that they are readily accessible to permit routine maintenance and replacement.

No point in the loft should be further than 7.5 m from the nearest smoke detector or, where heat detectors are used, further than 5.3 m from the nearest heat detector.

Ceiling-mounted detectors should be positioned with their sensitive elements between 25 mm and 600 mm below the ceiling in the case of smoke detectors, or between 25 mm and 150 mm below the ceiling in the case of heat detectors.

To avoid the effects of 'dead air' at apexes, detector manufacturers' instructions usually recommend that detectors on a sloping ceiling should be positioned horizontally away from the apex, typically by a distance of 900 mm.

Where ceiling-mounting of detectors is impracticable (for example, when mounting on the ceiling would make them inaccessible), wall-mounting of detectors should be considered, subject to this being allowed by the manufacturer's instructions. Manufacturer's instructions and clause 11.2(k) of *BS 5839-6: 2004* give recommendations for wall mounting of detectors.

Linking of fire detectors

Where a fire detector is installed in a loft, the detector should be linked to other detectors in the dwelling, either by wiring or radio links, so that the detection of smoke or heat by one detector provides an alarm signal in all detectors throughout the premises.

"In all cases, the manufacturer's instructions should be followed when siting fire detectors..."

Picture courtesy: Kee Safety Group

Periodic inspection and testing of PV systems

The small-scale photovoltaic (PV) systems that have become a familiar feature of Britain's roofscape present the electrical contracting industry with a range of challenges with regard to their periodic inspection and testing.

It seems that the rapid growth enjoyed by the sector and the controversy surrounding the reduction in feed-in tariffs (FITs) have distracted many in the electrical industry from considering the ongoing maintenance requirements for PV systems. For example, judging from the available literature, there appears to be little guidance on what needs to be inspected and tested (and how often), and what should be included in a condition report for a PV system.

The long-term guarantees offered by the manufacturers of PV modules may have led some to believe that PV systems will not deteriorate over time or develop faults. This is certainly not the case, so it would be unwise to regard PV systems as being maintenance free.

Indeed, PV systems have some inherent characteristics that, in certain circumstances, can make them potentially more dangerous than mains-powered electrical equipment.

Firstly, as long as the PV modules (panels) are in daylight, they will generate a dc voltage. That is, they are a source of electricity so, even if the modules are isolated from the inverter, the dc section of the PV system will remain energised. Secondly, the dc cables from PV arrays can be subjected to severe external influences including movement and abrasion due to wind and thermal movement. In a worst case scenario, a fault on the dc side of a PV system could lead to a fire, as fuses and circuit-breakers cannot be used to provide protection because of the current-limiting characteristic of the dc source.

Considering that *BS 7671: Requirements for Electrical Installations* requires the frequency of periodic inspection to be determined with regard to the type of installation and equipment, its use and operation, the frequency and quality of maintenance, and the external influences to which it is subjected (Regulation 622.1 refers), it is surprising that the particular needs of PV systems have not yet been addressed in any detail. While *BS 7671* contains many requirements applicable to PV systems, the section giving particular installation requirements (Section 712) includes no guidance on their periodic inspection and testing.

Similarly, although the Microgeneration Certification Scheme (MCS) has produced detailed guidance on the design and installation of PV systems, the MCS standard does not include recommendations for the periodic inspection and testing of PV systems.

One of the few references to the maintenance and routine testing of PV systems is made in clause 6.3 of the Energy Networks Association (ENA) document *Engineering Recommendations G83/2*, which recommends that periodic testing should be undertaken at an interval prescribed by the manufacturer of the PV system, and that this information should be included in the installation and user instructions.

However, *BS EN 62446: 2009 Grid connected photovoltaic systems – minimum requirements for system documentation, commissioning tests and inspection* provides electrical contractors with some guidance as to what should be included in the periodic inspection and testing of a PV system. Clause 5 of that standard, which gives particular requirements for the initial verification of PV installations, also states that the same requirements apply to the 'periodic verification' of an existing installation.

The Electrical Safety Council is developing guidance for the periodic inspection and testing of PV systems as part of its 'safer places' campaign. The guidance might include a model form, based on the Electrical Installation Condition Report, but designed specifically for small-scale PV systems taking into account the applicable requirements of *BS 7671* and *BS EN 62446*.

The Council would welcome readers' input to this development work, in particular constructive suggestions as to what the inspection and testing process should include. Please send your suggestions, together with any other feedback you wish to give, to **pv@esc.org.uk**

Have you ever been asked...

...how often do portable appliances in places like offices and shops need to be inspected and tested?

The Health and Safety Executive (HSE) has recently updated its guidance leaflet on maintaining portable electrical equipment in low-risk environments such as offices, shops, some parts of hotels and residential care homes.

The revised guidance is in response to the Löfstedt review, published in November 2011, which said that the legal requirements concerning maintenance of electrical appliances was "applied too widely and disproportionately", resulting in costly over compliance with the law.

In a press release on 2 May 2012, the HSE said that:

- it's a myth that every portable electrical appliance in the workplace needs to be tested once a year;
- the law simply requires an employer to ensure that electrical equipment is maintained in order to prevent danger - it does not state that every item has to be tested or how often testing needs to be carried out;
- testing appliances to ensure that they are safe to use can contribute to an effective maintenance regime, but in a low-risk environment most dangerous defects can be found simply by checking the appliances for obvious signs of damage such as frayed cables.

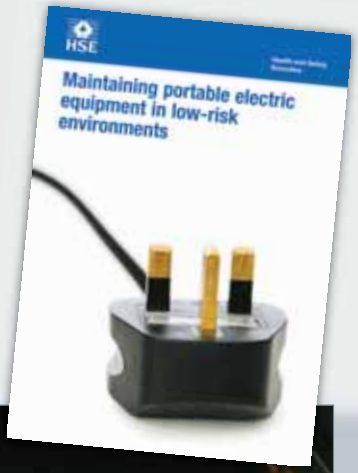
The new guidance leaflet, pictured below, is available as a free download at **www.hse.gov.uk/pubns/indg236.pdf**

The leaflet gives practical advice on ensuring the safety of portable electrical equipment in low-risk environments.

It points out that in some cases, a simple user check and visual inspection is enough, but that for other equipment, such as floor cleaners and electric kettles, a portable appliance test may be needed, but not necessarily every year.

Suggested initial intervals for user checks, formal visual inspections and combined inspection and testing (where applicable) are given in a table at the end of the leaflet.

Further information from the HSE on portable appliance testing, including answers to frequently asked questions and links to some other relevant HSE publications available as free downloads, can be found at **www.hse.gov.uk/electricity/faq-portable-appliance-testing.htm**



Long-term load testing of *BS 1363* plugs and sockets

The Electrical Safety Council has carried out further research to assess the performance of a selection of plugs and socket-outlets of different construction types under prolonged cyclic operation.

In the Spring 2011 issue of *Switched On*, the Council reported on its investigations into the capability of plug and socket-outlets conforming to product standard *BS 1363* to operate safely, repeatedly and reliably at their maximum rated current.

This investigation was carried out in response to discussions within the motor vehicle manufacturing industry concerning the suitability of the UK's existing *BS 1363* 13 A plug and socket-outlet system as a connection solution for charging electric vehicles in the home.

Although the research concluded that 13 A plugs and socket-outlets are capable of continuous operation at their maximum rated current, it was noted that the small sample size and the limited test duration (3 x 8 hour operational runs at 13 A, 230 V) would need to be taken into account when considering the results.

Since then, reports from electricians on electrical installation website forums have indicated that 13 A plugs and socket-outlets used for charging electric vehicles are suffering from thermal damage in the longer-term, and a contributory factor may be their construction type (ie plastic, metal-clad, etc).

Therefore, the Council decided to extend the research carried out previously, to assess the performance of a selection of plugs and socket-outlets of different construction types under prolonged cyclic operation.

An independent test laboratory was commissioned to subject three sets of plug and socket-outlet combinations to the following test programme:

- Each plug and socket-outlet set was operated for 28 days with On and Off periods as described below:
  - Over one 24 period – 8 hours On, 1 hour Off, 8 hours On and 7 hours Off (effectively simulating two months usage of eight hours per day);
- During the On period of operation, each plug and socket-outlet set was loaded at 10 A (resistive) and an identical set was loaded at 13 A for the duration of the 28-day test period.

Test currents of 10 A and 13 A were selected to replicate the lower and upper range of charging currents typically used and specified by vehicle manufacturers for charging electric vehicle batteries when connected to the supply via a *BS 1363* plug and socket-outlet. Where relevant, the cable sizes and the torques applied to clamp the cables were selected using *BS 1363* as guidance.

The pairing of the plugs and socket-outlet sets was as follows:

Figure 1, Set 1: An *IP66*-rated (outdoor use) enclosed socket-outlet and standard moulded rewireable plug.

Table 1: Observations of plug and socket-outlet pairings after after 28 days of test

Loading	Visual or physical damage	Max temperature rise at socket-outlet terminals (Max allowed: 52K)
Set 1		
10 A loading	None	20.1K
13 A loading	None	30.8K
Set 2		
10 A loading	Visible crack in engagement face of the socket-outlet causing misalignment of socket contacts (see figure 4)	17.1K
13 A loading	Visible crack in engagement face of the socket-outlet causing misalignment of the socket contacts	26.1K
Set 3		
10 A loading	None	27.2K
13 A loading	Fuse clip in the plug showed discolouration (see figure 5)	56.6K

Figure 2, Set 2: A moulded plastic socket-outlet and non-rewireable plug fitted to an IEC power lead (0.75mm^2 cable).

Figure 3, Set 3: A metal-clad socket-outlet and heavy duty (rubberised) rewireable plug.

The plug and socket-outlet pairings were selected to reproduce the most likely onerous and favourable combinations of construction type, in terms of thermal performance.

At the end of the 28-day test period, all the samples were visually examined for signs of damage or harmful effects (see table 1). The temperature rise at the socket-outlet terminals was also measured.

Figure 4: Visible crack in engagement face of socket-outlet.

BEFORE

AFTER

Figure 5: Discolouration of fuse clip.

The laboratory concluded that certain combinations of *BS 1363* plugs and socket-outlets subject to prolonged cyclic use at loads of 10 A and greater can result in overheating and damage that may cause the plug and socket-outlet to potentially become unsafe.

BS 1363 allows a maximum temperature rise at socket-outlet terminals of 52K. At 13 A load, the line (L) terminal of the socket-outlet in Set 3 exceeded 52K, which in the long term would be likely to cause damage to the socket-outlet and to the PVC (thermoplastic) insulation of the cable connected to it, which has a maximum normal operating temperature of 70°C.

It was concluded that the crack that formed in the engagement surface of the socket-outlet in Set 2 at a loading of both 10 A and 13 A may well be attributed to the prolonged period of thermal cycling that the material of the front plate was subjected to. The fact that the plug in this instance was wired with a 0.75mm^2 flexible cable may also have contributed to the heating effect on the front plate (a flexible cable size of 0.75mm^2 is rated at 10 A where non-rewireable plugs are used with a maximum cable length of 2 m). Furthermore, the grade of the front plate material may also have played a part in the cause of the cracking.

Although the findings did not single out any particular combinations of plug and socket-outlet construction that performed better under prolonged cyclic use, they did indicate some general performance issues concerning degradation beyond that expected from normal use being observed in some instances. In particular, at 13 A loading, the extent of thermal damage observed on completion of this relatively short test period is cause for some concern, given the expectation that 13 A plugs and socket-outlets are suitable for continuous loading at their maximum rated current within the scope of *BS 1363*.

The ESC continues to liaise with electric vehicle and electrical accessory manufacturers on the findings of this investigation, and will provide an update in a future edition of *Switched On*.

A copy of the laboratory test report is available to view in the 'Industry' section of the Council's website: www.esc.org.uk

COUNCIL PARTNERS WITH TRADING STANDARDS TO IDENTIFY UNSAFE ELECTRICAL PRODUCTS

As part of its continued efforts to reduce the growing number of fake and substandard electrical goods on the market, the Council has been supporting Trading Standards Officers (TSOs) with a range of initiatives. In particular, the sheer number of potentially dangerous chargers flooding the UK, which are a concern due to the risk of electric shock and fire, has driven the ESC to work with key partners in an attempt to remove them from the market and provide advice. This includes working with Trading Standards teams carrying out raids at locations throughout the UK, and developing safety information for consumers and traders.

The ESC's Martyn Allen and Steve Curtler have also featured on *BBC's Fake Britain* (see page 5) – accompanying Trading Standards officers involved in the removal of counterfeit electrical chargers from a variety of retailers in the UK and providing advice to viewers.

With such common objectives, the relationship between Trading Standards and the ESC has become mutually supportive. The ESC has attended The Trading Standards Institute's Annual Conference for the last six years and this year's event proved to be the busiest ever.

Feedback from TSOs during the course of these various initiatives has indicated that guidance in spotting potentially dangerous products would be extremely helpful if made available in a user-friendly format.

In response, at this year's TSI Conference the Council focused on providing such guidance. The ESC seminar session entitled **'Identifying unsafe electrical products – your 10-point checklist'** drew a lot of attention with over 120 attendees – and the Council is pleased to report that it won the Best Session award for its informative and engaging format. The purpose of the session was to give TSOs guidance on how to adopt a consistent approach to identifying those electrical products that may pose a risk to consumers and warrant further investigation or enforcement action.

Seminar attendees and visitors to the stand were invited to provide feedback on the draft checklist for the ESC to take into account when developing the final version, which is likely to be available by the end of the year.

BACK ISSUES OF SWITCHED ON

All the previous issues of Switched On are available to read or download from the 'Business & Community' section of our website.