

“What’s in your socket?”



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Background

It's a sad fact that it usually takes a death or serious injury before a glaring safety matter is properly addressed. Unfortunately, when it gets to that stage, the response is frequently a 'knee-jerk' reaction that fails to adequately consider all the issues including the underlying factors that caused the problem in the first place.

Every day thousands of lives are put at risk in the UK, particularly young lives, whenever any one of the hundreds of thousands of cheap unbranded Chinese made AC/DC adapters is plugged into the mains to charge up a mobile phone, I-pod, or games machine.

Fortunately, we in Buckinghamshire Trading Standards do not have a fatality or serious injury to report – but we believe this is probably more luck than anything. We do, however know of numerous near misses – electric shocks and burns, some of which have required medical treatment. Is an inevitable young death just around the corner?

Consumers are happy to pay hundreds of pounds for the latest life-style enhancing technology and £20-£40 on games or upgrades, but peanuts, sometimes as little as 99 pence, on the charger.

Amazingly this is old news. We are but one of a long line of Trading Standards Services to have discovered that in this Internet age the market place is flooded with potentially lethal chargers. Traditionally, when a complaint comes in, an investigation is carried out, seizures and recalls instituted with due alacrity, press releases are picked up by the local media and perhaps in the fullness of time, if the evidence sustains it – a prosecution follows. But the problem does not go away!

Each Trading Standards is hindered by the localised nature of their remit and resources. Of course, during an investigation a RAPEX notification will be posted and other services alerted, but the root cause that there is no one agency with national responsibility for overseeing the safety of consumer goods, electrical or otherwise persists. Enforcement is piece-meal when a coordinated inspection regime is required, on a par with the Food Standards Agency or DEFRA with their responsibility for the safety of the food chain.

As a result there is no registration scheme for the multiplicity of importers, wholesalers and retailers of consumer goods. Such a scheme would include an external audit process to ensure that adequate systems are in place to hopefully minimise the risk that unsafe products become freely available on the UK market. Although this may be considered impracticable in a complex free market economy where a culture of relaxed regulatory controls prevails, we believe the scale and severity of the problem warrant this action.

The starting point for this report was June 2008 when an apparently routine referral from another Trading Standards service came to us. A gaming machine charger had allegedly 'blown up', tripping the electrical circuit breaker and leaving a child with blackened fingers, but otherwise not the worse for wear. The distributor of the charger was based in Buckinghamshire and this was where our initial investigation commenced.

What we discovered was a tangled web of distribution, which started some 5000 miles away in China and frequently ended in a child's bedroom having passed through a number of intermediate handling stages. It seems that numerous small to medium size traders are regularly travelling to and from China, haggling over fractions of a dollar in unit costs and arranging for the mass importation of hundreds of thousands of chargers.

The importation, wholesale and retail distribution network seems to be a well oiled machine spreading these chargers far and wide throughout the UK, but without once being subjected to any semblance of the legal due diligence processes that underpin the free-flow of goods in the European Union. During our investigation, when questioned, traders claimed that they simply relied upon the veracity of the CE mark and made no subsequent checks of their own to ensure that the chargers were safe. Any concept of personal responsibility, let alone liability, for the goods they sold was frequently alien to them.

Findings

The UK Market for Mains Chargers:

Statistics gathered from a well known internet auction site for a 3 month period in 2008 revealed total charger sales (both branded and unbranded) of 115,915 chargers in the UK. As the retail price was no more than £2.00, plus p&p. it is likely that most of these sales were for unbranded chargers. Given that this website accounts for approximately 25 % of total on-line sales in the UK, annual on-line sales are estimated to be in the region of 1, 854,640 (1.8 million). The number of sales from more traditional retail outlets can only be guessed at. In a sweep across markets and independent retailers in Buckinghamshire more than 3600 unsafe chargers were seized over a 6-8 week period alone.

Unsafe charger units are being manufactured in China from as little as \$0.46 (Hong Kong Dollar) or £0.03. Fully compliant chargers typically cost from \$2.00 to \$3.00 (HK) (Approximately £0.20). Clearly, the real cost to the importer is the shipping. However, the following taken from The Times for 18 February 2007 is quite revealing:

Take a typical, small plastic toy. It leaves the Chinese factory and goes into a shipping container at the port for a “free on board” (FOB) price of 22p. Daniel (the importer in this case) will pay for shipping, British customs duty, insurance and unloading into a warehouse. His costs bring the price “landed” in the UK to 31.5p.

One correspondent to the service claimed that Chinese manufacturers were submitting well engineered electrical products to obtain conformity testing reports, but then removing non-essential components in production to reduce costs.

Typically we have found that unbranded chargers have a range of generic bodies (see examples in Appendix 1) largely moulded in black plastic and usually heat sealed. White plastic chargers are rarer because white plastic is more expensive to mould. These generic bodies can then support any number of different connectors depending on the make and model of the product the charger is sold to support. Branded chargers are usually unique in their general design. The only identifying information for the buyer of an unbranded charger is a small paper sticker on the packaging (if any) or the charger itself. The good news for the consumer is that there appears to be a cheap charger for any make or model of mobile phone, toy or handheld games consoles that you might require – the bad news is that it could kill you!

Testing

At the beginning of our investigation, we asked the importer to supply copies of the technical file for the exploding games machine charger. We received a very impressive looking multi page test report compiled in China which had been sent to the importer by the manufacturer as a result of our request. Unfortunately, the test report was for a different model and in any event was for a European two-pin adapter. There was no other information available. Sadly we have found this to be the case time and again as our investigations mushroomed.

Therefore we have to date commissioned 27 independent tests. 19 of the tests were for unbranded (classified as unmarked or a minor brand name) and 8 were branded (with a big brand name e.g. Motorola, Nokia, Sony Ericsson). Whilst we are pleased to report that all of the branded chargers passed the conformity tests, not one of the unbranded chargers were considered to be safe, yet all carried the CE mark.

The findings of the test reports on unbranded chargers were depressingly similar and can be largely summed up by this conclusion drawn from one test report:

‘...the departures and observations detailed are such that the chargers in question did not meet with the principal elements of the safety objectives listed in Schedule 3 of the Electrical Equipment (Safety) Regulations 1994.

1. *The internal insulation did not provide adequate insulation between the input and output circuits. A breakdown of the insulation could cause the output circuit to be energised at mains voltage with the risk of electric shock.*
2. *The internal connections relied upon solder to maintain their position. A loose wire could reduce creepage distances and clearances with the risk of electric shock.*
3. *The charger had inadequately sized pins. This could cause overheating or arcing within the socket.*

The charger was inadequately marked. Whilst this did not make the charger unsafe, it was a departure from the British Standard and item 1 (b) of Schedule 3 of the Electrical Equipment (Safety) Regulations 1994 requires the manufacturer's brand name or trade mark to be clearly printed on the electrical equipment. Its absence therefore, is a technical breach of these regulations.

Appendix 2 is an extract from one report, which demonstrates the typical compliance failures that have been revealed in tests.

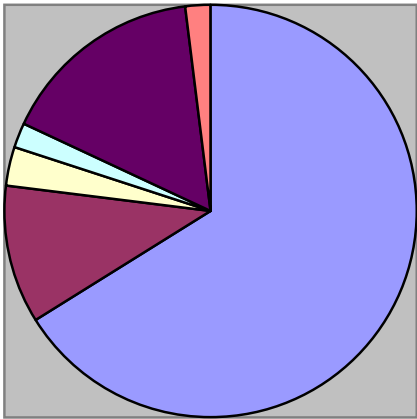
Buckinghamshire Trading Standards has carried out an extensive press campaign to advise and educate consumers about the dangers posed by the unbranded travel chargers. As a result of this and the work of our colleagues in other authorities public awareness is probably higher than at any time in the past, and we have witnessed a 62% drop in sales of travel chargers during July 2008 (compared to the previous 2 months) when our campaign was at its height. Whilst some may argue that this is a natural consequence of the general economic malaise, we would argue that in fact traditionally sales of low-cost items are usually less prone to the vagaries of the market place.

CE marking

Perhaps because it is part of our everyday life we in Trading Standards assumed that there was wide spread understanding of the CE mark and what it generally stands for. Clearly as we previously stated traders take it, rather disingenuously in many instances, as a no questions asked indication of conformity and therefore safety. Consumers, however, are largely ill informed and apparently in the main take little notice of the CE mark in making their purchasing decisions.

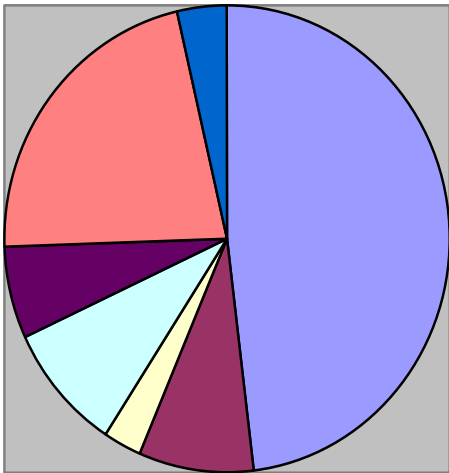
In August 2008 Buckinghamshire Trading Standards carried out a survey to assess consumers' awareness of the CE mark. A cross section of 100 Buckinghamshire consumers were asked the following questions:

What does the CE mark mean to you?



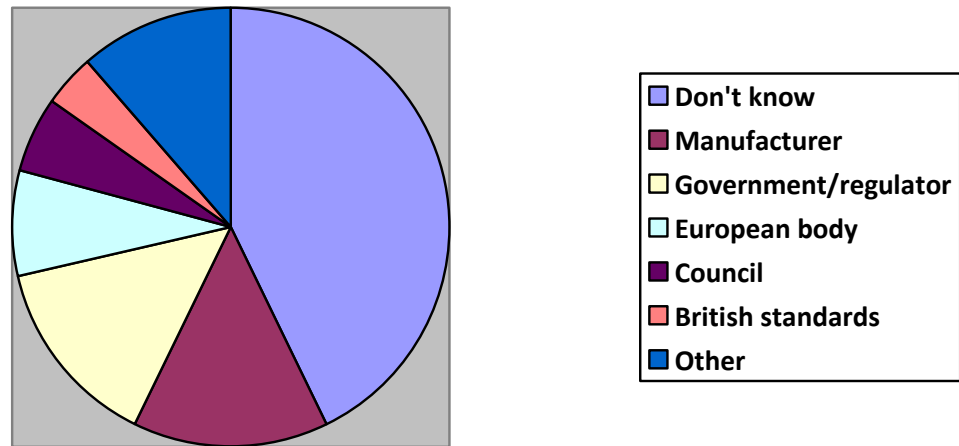
- Don't know
- Quality/ Standard mark
- Kite Mark
- Electrical Goods
- Other varying answers
- Church of England

Where would you find the CE mark?



- Don't know
- Toys
- Food
- Toys & Electrical Goods
- Electrical goods
- Other answers
- Most goods

Who applies the CE mark?



Some of the 'Other' responses were quite entertaining, including a lady who thought the mark meant The Church of England, was found in the Parish Magazine and applied by the Vicar !!!

The Bigger Picture

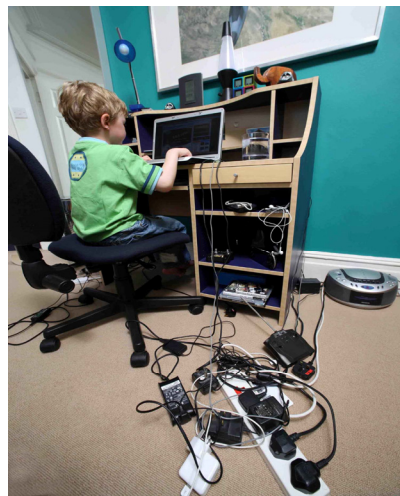
The EU's 2007 Rapex report revealed that almost half of all Rapex notifications across the Union concerned goods made in China and that 19 per cent of these complaints were about unsafe electrical products. There have been 36 RAPEX notifications citing unsafe charger units reported in the last 12 months from 11 member states: Germany, UK, Netherlands, Slovenia, Greece, Spain, Slovakia, Hungary, Denmark, France and Finland. These are in addition to the 19 failed products we are investigating.

In the meantime the Electrical Safety Council (ESC) is warning that many of our most vulnerable consumers are potentially in danger by the sheer volume of electrical gadgetry now located in a child's bedroom.

In June 2008 the ESC released a press release, which contained the following extract:

“Childrens’ bedrooms now contain more electrical gadgets than any other room in the house. ...the average child's bedroom in the UK is buzzing with more electrical gadgets than ever before creating a potential danger zone....

Research commissioned by the charity has found that roughly two in three 4-11 year olds in the UK (63%) now have their own TV in their bedroom. And, nearly half of young children (48%) have games consoles or other electrical toys in their room. 38% were revealed to have a mobile phone charging in their room, and around a third of children (34%) had their own computer set up in their bedroom, many of which are accompanied by printers, scanners and other electrical kit.



This child's bedroom may contain upwards of a £1000 of electrical equipment. We believe the demand for the cheaper chargers is sustained because consumers are unaware of the potential risk of electrocution and fire hazards that the cheaper units can pose. There seems to be a general presumption amongst UK consumers that if a product is on sale in the UK it must be safe! Indeed public knowledge of electrical safety hazards is worryingly low (see the Consumer Survey Results below) It is also believed that only about half of the domestic properties in the UK have RCD circuit breakers installed to protect against faulty or unsafe electrical equipment.

Action

“The single-price buyer is the toughest in the world,” said Daniel. Every cost has to fit inside that magic number: 99p in Britain and 99 cents in America. “It’s a zero-sum game.” (The Times 18 Feb 2007)

Clearly, we are not proposing that all trade relations with China are suspended. In reality given the foreseeable economic situation China will continue to be one of the world’s major workshops, particularly for post-industrial Western Europe. The challenge for government and the enforcement community is to bridge the gap between perceived value for money and safety.

A plethora of approaches to the danger are available, although no one approach is likely to succeed on its own. Given the problem is European wide, coordinated action across borders is paramount.

We believe that adopting the following actions will significantly improve the situation:

National Product Safety Agency (PSA)

First and foremost we urge the creation by government of an independent single agency to protect the public's health and consumer interests, based on risk analysis, in relation to consumer goods. The Food Standards Agency could provide the model which would help promote a positive product safety regime within the UK.

However, although many of the following would ultimately come under the umbrella of the ‘NPSA’ a number of subsidiary actions are also urgently required:

Introduce a Registration System.

In the name of food safety, businesses manufacturing or supplying food for human consumption are required to register with their local authority in order that due diligence processes can be assessed and compliance with food hygiene controls are in place. A similar system would enable local authorities and regulatory bodies to know where the businesses are selling electrical goods and so advise/monitor if needed.

Guidance for Traders / Awareness Campaign.

Improve trader guidance on the steps to ensure due diligence and emphasising their personal liability for the safety of the goods they supply.

Introduce ‘On the Spot Fines’ for non – compliant goods.

A fine for obvious failures for certain breaches of product safety regulations would focus the mind of suppliers on their obligation to supply goods that are safe.

Consumer Education

Given the low levels of understanding about electrical safety there is a fundamental need to educate consumers of all ages. An understanding that the overall price of the goods may be higher due to better testing and/ or quality of manufacture may ensure that consumers are more discerning in their purchasing decisions – hopefully where consumers lead even rogue traders will be forced to follow. The public should also be aware of the risk of overloading multi plug adapters, and the danger of plugs over heating and starting a fire.

Re-instate the HASS and LASS Databases to compile statistics

The HASS and LASS databases (which compiled Home and Leisure Accident Statistics) have been discontinued and this means that statistics are not being compiled showing injuries resulting from electrical goods. Without this important measure there is no way to ascertain if product standards have fallen and more accidents are happening.

Trading Standards Services work more closely.

Our profession should look to itself and improve the sharing of information and routinely undertake more cross boundary and coordinated action in the name of safety. Indeed during the progress of this investigation we have been encouraged by the goodwill and willingness of colleagues in other authorities to provide information and assistance. A more formalised protocol, however is required.

Thanks and acknowledgments

Whilst this is an on-going investigation we wish to acknowledge the support we have had from a number of sources, both inside and outside the Trading Standards community. Many of the people or organisations who have provided us with support and information will wish to maintain anonymous for obvious commercial reasons. They know who they are and we thank them. However, we would also like to extend particular thanks to the following:

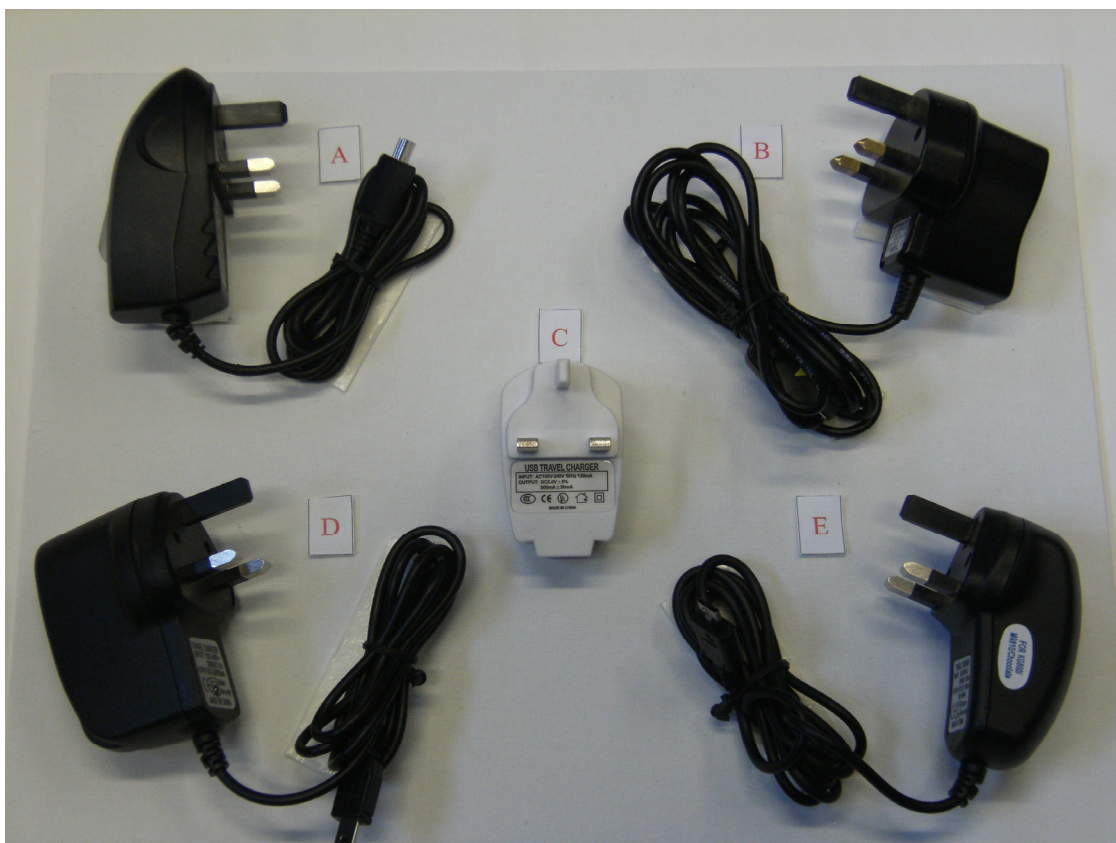
Electrical Safety Assessments Limited

Electrical Safety Council

And all the Trading Standards who have assisted our investigation

Appendix 1

Generic Charger Bodies



Appendix 2

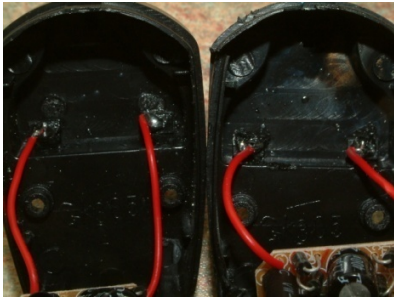

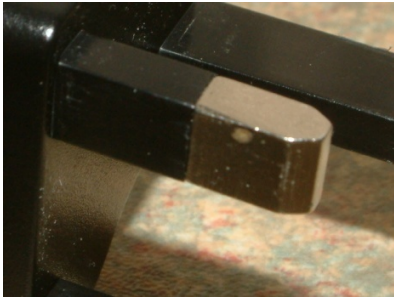
What the Chargers are failing on



Chargers need to comply with the principal elements of the safety objectives stated in the **Electrical Equipment (Safety) Regulations 1994**.

With reference to the following British Standards:

BSEN 60950
BS1363 part 1

The specific areas of concern are illustrated clearly by this recent Report:

<p>1. Clause 3.1.9 <i>This clause requires that for soldered terminations, reliance is not placed upon the soldering alone to maintain the conductors in position.</i></p> <p>On these samples the conductors had not been mechanically retained and there were no barriers to prevent a detached wire from reducing creepage distances and clearances to levels below the minimum required by the standard.</p>	
<p>a. Clauses 12.1 and 12.2.1 of BS1363 <i>These clauses require the disposition of the plug pins to be as shown in fig 4a of the standard and that the pins can fully enter the gauge shown in fig. 5 of the standard when a force of 10N or less is applied.</i></p> <p>On these samples the disposition of the pins was incorrect. The picture shows the limit of entry of one of the samples into the fig. 5 gauge after a force of 10N was applied.</p>	
<p>b. Clause 12.2 of BS1363 <i>This clause states that the dimensions of the pins must comply with fig. 4a of the standard.</i></p> <p>The British Standard requires the breadth of the pins to be no greater than 6.48 mm. The breadth of the live and neutral pins exceeded this limit.</p>	

<p>c. <i>Clause 12.3 of BS1363</i> <i>This clause states that no part of a live or neutral pin shall be less than 9.5 mm from the periphery of the plug measured along the engagement surface.</i></p> <p>The pins on these samples were 2.5 mm from the periphery.</p>	
<p>2. <i>Clause 1.7.1</i> <i>This clause requires the sample to be legible and durably marked with the manufacturer's identity mark, the model number or type reference and its electrical rating information.</i></p> <p>These samples had not been marked with the manufacturer's name or trade-mark or identification mark.</p>	



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