

# Safety Screening Report

**Report:** 071-75924520-502 **Date:** 09/01/2014

**Client:** The Electrical Safety Council  
Unit 331 Great Guildford Business  
Square 30 Great Guildford Street  
London  
SE1 0HS

**Product:** Electrical Socket **ESC Sample Number:** 7

**Summary:** TÜV SÜD Product Service was commissioned by The Electrical Safety Council to evaluate an Electrical Socket (see figure 1). The aim of the assessment is to assess the product against the clients Safety Screening Test Plan.

## Summary

The product failed every section of the report except for the screws, current carrying parts & connections, insulation resistance/leakage current & electric strength. The product is not considered fit for purpose and is a hazard to safety.

Figure 1



**Assessed by:**



**Anna Jeeves**  
Consumer Product Technician

**Reviewed by:**



**Greg Plummer**  
Consumer Product Test Engineer

**Colour Code**

**Red** = Fail/Major Fault

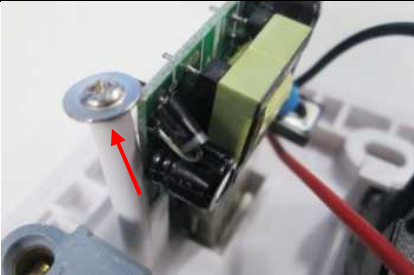


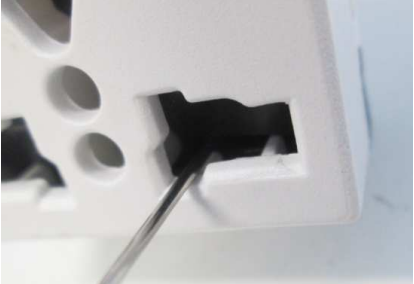
**Amber** = Improvements Required



**Green** = Pass

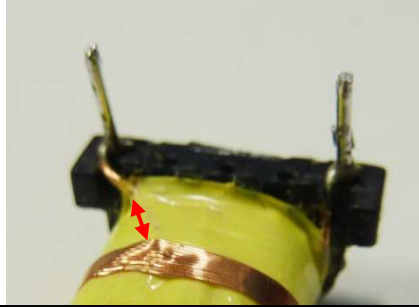


Testing Information	
<b>Testing Laboratory:</b>	TÜV SÜD Product Service
<b>Location:</b>	Octagon House, Concorde Way, Segensworth North, Fareham, Hampshire, PO15 5RL. UK.
<b>Client:</b>	The Electrical Safety Council
<b>ESC Sample Number:</b>	7
Product Information	
<b>Product Description:</b>	Single Wall socket with a USB Port
<b>Rated Input Voltage:</b>	250VAC
<b>Rated Output:</b>	13A, none stated for the USB socket.
<b>Protection Class:</b>	Class I

Findings			
Markings/Warnings (BS 1363-2, Clause 7)			
<b>Marking of Product</b>	<input checked="" type="checkbox"/> -Inadequate <input type="checkbox"/> -Poor <input type="checkbox"/> -Adequate <input type="checkbox"/> -Good <input type="checkbox"/> -Very Good <input type="checkbox"/> -N/A		
<b>Comments</b>	<p>The product as a unit was unmarked. A model reference, distributor name / trademark, WEEE log and CE marking were missing and must be present.</p> <p>The socket assembly was marked with electrical ratings and the CCC mark which could not be verified online. BS 1363 was not present; therefore not considered to be UK approved. The conductor inputs were clearly marked.</p> <p>The switch was also marked with the CCC mark. The switch current rating stated was 10A for a 13A socket. A part reference / manufacturer trademark was missing. The USB output ratings were missing and should be made available / visible to the end user.</p> <p>There were no instructions supplied with the product to enable an assessment. Information covering general safety, installation and operation should be made available to the installer / end user. The packaging stated that the product was suitable for digital products including mobile phones, cameras and MP3s.</p>		
<b>Markings/Photo</b>	<input checked="" type="checkbox"/> -Yes <input type="checkbox"/> -No <i>If yes see last page of report</i>	<b>CE Marking</b>	<input type="checkbox"/> -Yes <input checked="" type="checkbox"/> -No
Construction (BS 1363-2, Clause 13)			
<b>Product Build Quality</b>	<input type="checkbox"/> -Pass <input checked="" type="checkbox"/> -Fail		
<b>Comments</b>	<p>The external construction was of an adequate standard. No sharp edges or burrs were found. The mouldings were considered to be of a lesser standard in comparison to similar products already on the market. The PCB was slotted into the mouldings. This was retained by the outer rims of screws which were inserted into pillars either side. The use of the metal screws in close proximity to the PCB and metal pattress (if used) was not considered appropriate.</p>		

	 <p>BS 6004 electrical cable was fitted to the sockets conductors in addition to the connections already in place to the PCB. However it was difficult to retain both due to the differing gauges. It was noted the switch to one of the samples had been fitted incorrectly which prevented access to the screw. The PCB required removal to gain access to the conductor socket screw.</p> 
<b>Accessibility of Live Parts (BS 1363-2, Clause 9)</b>	
<b>Constructional Quality</b>	<input type="checkbox"/> -Pass <input checked="" type="checkbox"/> -Fail
<b>Comments</b>	<p>Only the live and neutral sides of the socket were shuttered. Further inspection revealed that these did not operate simultaneously as required by the standard.</p>  <p>Access to internal live parts was achieved when applying a 1.0mm to the live and neutral output conductors with calibrated test pin. Further inspection revealed that the shutters could not fully close when a plug was extracted due to the form of the internal mouldings.</p> 

Terminals & Terminations (BS 1363, Clause 11)	
<b>Constructional Quality</b>	<input type="checkbox"/> -Pass <input checked="" type="checkbox"/> -Fail
<b>Comments</b>	<p>A number of BS 1363 approved plugs failed to fully fit into the socket. It was found that the earthing pin required some manipulation to enable it to fully insert. This movement caused some deformation to live and neutral output conductors, potentially causing stress on to the attached input conductors.</p>  <p>The copper part of the earthing conductor was pressed onto the brass part and not welded as expected. This assembly was also noted to be loose within the moulding.</p> 
Internal Wiring / Separation (BS EN 61558-1, Clause 21)	
<b>Constructional Quality</b>	<input type="checkbox"/> -Pass <input checked="" type="checkbox"/> -Fail
<b>Comments</b>	<p>The output (SELV) circuit was found to be adequately separated from the input circuit. The PCB was fully exposed with no form of insulating material or encasement; therefore it is considered that live parts of the SELV circuit could come into direct contact with the protective earth if installed into a standard 35mm galvanised patress box.</p> <p>There was insufficient information on the wiring to enable verification of any 3<sup>rd</sup> party approvals.</p>
Screws, Current Carrying Parts & Connections (BS 1363-2, Clause 13)	
<b>Constructional Quality</b>	<input checked="" type="checkbox"/> -Pass <input type="checkbox"/> -Fail
<b>Comments</b>	The connections to the PCB were found to be mechanically secured and soldered.

<b>Creepage Distances, Clearances &amp; Distances Through Insulation (BS EN 61558-1, Clause 26)</b>	
<b>Constructional Quality</b>	<input type="checkbox"/> -Pass <input checked="" type="checkbox"/> -Fail
<b>Comments</b>	<p>The minimum creepage / clearance distance measured between the primary and secondary side of the circuit board (2.5mm) with a 1.3mm slot was found to be within the limit of the standard. There was a minimum distance measured between the primary and secondary transformer windings (3.7mm) therefore did not meet the requirement of the standard. A minimum of 5mm is required.</p> 
<b>Short Circuit, Overload and Thermal Protection (BS EN 61558-1, Clause 15)</b>	
<b>Constructional Quality</b>	<input checked="" type="checkbox"/> -Pass <input type="checkbox"/> -Fail
<b>Comments</b>	It is good practice to incorporate a fuse to the primary side of AC / DC circuit; however this was not present. Although not a requirement it is recommended that a thermal protective device is incorporated into the circuit.
<b>Mechanical Strength (BS 1363-2, Clause 20)</b>	
<b>Result</b>	<input type="checkbox"/> -Pass <input checked="" type="checkbox"/> -Fail
<b>Comments</b>	A standard USB connector was placed in to the socket. This was subjected to an impact test of 5Nm to each side and around the facia / switch. No damage was observed to the USB port or socket face; however the switch assembly was forced inward on the first impact.
<b>Insulation Resistance / Leakage Current (BS EN 61558-1, Clause 18.2)</b>	
<b>Result</b>	<input checked="" type="checkbox"/> -Pass <input type="checkbox"/> -Fail
<b>Comments</b>	The product was subjected to an insulation resistance test with a voltage of 500VDC applied. This was measured between live / neutral and the USB output. A measurement of >999MΩ was recorded across each path; therefore meeting the requirement of >5MΩ.
<b>Electric Strength (BS 1363-2, Clause 15 / BS EN 61558-1, Clause 18)</b>	
<b>Result</b>	<input checked="" type="checkbox"/> -Pass <input type="checkbox"/> -Fail
<b>Comments</b>	The product was subjected to an electric strength test to 1500VAC. The output was tested to 4242VDC. No breakdown or flashover occurred.

**Output Voltage & Current Under Load  
(BS EN 62684, Clause 5)**


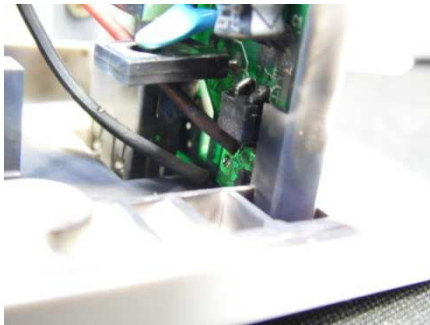
**Result**       -Pass    -Fail

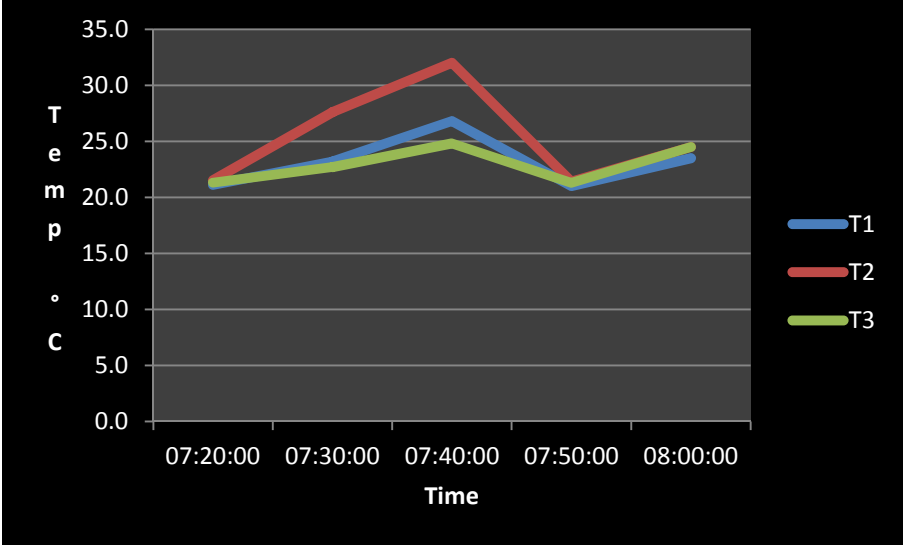
**Comments**

The device was plugged in and the open circuit voltage measured across the USB ground and supply. It was found to be 5.229 VDC and was between the limits of 4.75 – 5.25VDC.

There was no stated maximum output current for the USB socket. No short circuit test was possible as the sample had exploded before it could be completed.

The device was setup with a load bank and the load slowly increased to 0.5A. The temperature was monitored around the device. After about 1.5 hours the sample exploded and the test was stopped. Both USB socket wires were blown off the PCB and it appeared an 8.2Ω surface mount resistor exploded.



Time	T1 (°C)	T2 (°C)	T3 (°C)
07:20:00	21.0	21.0	21.0
07:30:00	23.0	27.0	23.0
07:40:00	27.0	32.0	25.0
07:50:00	21.0	21.0	21.0
08:00:00	23.0	23.0	23.0

T1=Left of USB socket  
T2=Right of USB socket  
T3=Base

The maximum recorded temperature was 32.0°C.

**Product Images**

**Internal Overview**



**Internal Face**



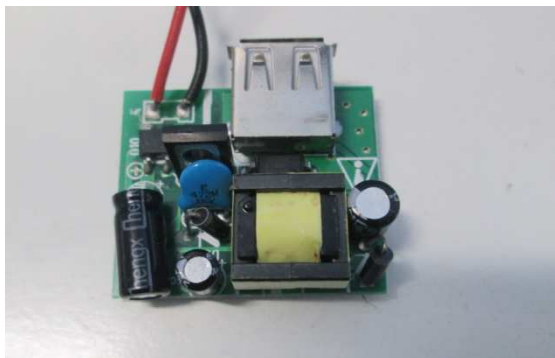
**Packaging**



**Markings**



**Internal Construction**



**Internal Construction**

