ACI/131/12 December 2012

Key issues surrounding CCA Category 5e cables

Here Iain Ballingall, spokesperson for the Approved Cables Initiative re-iterates some of the key issues all should be aware of when working with “so called” CCA Category 5e cables.

1. Low frequency testing issues:

The increased resistance of aluminium leads directly to 2 probable failures when the installed cable is tested in as a longer Permanent Link.

a) Typically with installed links above 70m and sub 90m the link will probably show a Direct Current Resistance (DCR) failure simply due to the higher resistance of the aluminium and the physical length of the cable.

b) The low frequency attenuation or insertion loss of the link will also show failures in the same 70m to 90m range.

It is difficult to define an absolute failure length due to the variation in the types and quality of CCA in the market. The really cheap versions have now less than 20% copper and will fail DCR and low frequency attenuation requirements at even shorter lengths.

The same will also hold true for other low cost solutions purporting to be Category 5e such as CCS (Copper Clad Steel) and CCC (Copper Clad Copper). Perhaps the most compromised in terms of transmission distance is CCS (e.g. < 30m) whilst CCC products employ a copper alloy clad with pure copper will perform similar to CCA.

2. CE Marking Conformity:

Category 5e cabling should be in packaging that carries the CE Mark. The CE marking is to comply with the low voltage directive (LVD) and it is an obligation on the manufacturer, importer and distributor to maintain a “Technical File” of specification and test information for the product. When a product complies with published national or international standards the basis for the EC Declaration of Conformity is quite straight forward. When a product such as CCA is introduced to the market that does not comply with any standards then the burden on the person placing the product on the market or distributing the product becomes more onerous to justify the conformity of their product to the essential safety requirements of the LVD.

3. Conductors breaking during termination:

The reduced strength of the CCA conductor normally leads to poor retention of the wire within the Insulation Displacement Connector (IDC) and consequently poor termination reliability. IDC's are designed for copper; some CCA will snap off immediately or later on, fail.

4. Problems with oxidisation:

Aluminium does oxidise and this will cause low and high frequency problems, which might not occur immediately after testing the installation. After some time the installation could slow down or even fail completely.

5. Cables overheating:

Category 5e cables can carry around 25 Watts of power today for IP phones, wireless access points and cameras. In larger installs the where significant numbers of cables are bundled, the temperature rise generated through bundling together with the increased resistance of CCA will lead to the supported cable length being compromised to below 70 metres whilst also increasing the risk of premature ageing of the cables.

The applications perspective:

Category 5e is a cabling standard developed in conjunction with the IEEE and 802.3 for the purposes of supporting 1000BASE-T or Gigabit Ethernet applications however today the applications have grown to include other applications such as IP video, IP Phones, Wireless, Power over Ethernet (PoE), and more.

It is a virtual certainty that the end user will here will be compromised through the deployment and performance limitations of non-compliant CCA, CCS, CCC and reduced diameter copper cables.

The Approved Cables Initiative is addressing the issue of unsafe, non-approved and counterfeit cable entering the UK marketplace. Anyone with information or concerns about a suspected faulty or counterfeit cable should contact the ACI who will test samples and if found to be unsafe supply details to relevant industry regulators and legislators. ACI can also provide guidance where appropriate to installers.

For suspect importers, manufacturers and distributors, the ACI is direct in its approach to investigate and publicise the results. This is the first initiative of its kind in the electrical industry with the framework to proactively communicate, educate, investigate, eradicate and legislate.

The ACI is an industry-wide working group with supply chain representative bodies including Electrical Distributors Association (EDA); Electrical Contractors Association (ECA); Electrical Safety Council; British Approvals Service for Cables (BASEC); British Cables Association (BCA); Energy Networks Association (ENA); Ascertiva Group; SELECT and JIB.

If you have information regarding the misselling of electrical or data cable or would like some advice on defective cables please contact the ACI on 020 8946 6978 or email info@aci.org.uk. For further information about the ACI visit www.aci.org.uk