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GREEN NETWORKS



BUYER BEWARE

WHAT CAN BE DONE
ABOUT CCA CABLE?

DESIGN AND BUILD

THE LONG-TERM
APPROACH TO
DATA CENTRE
CONSTRUCTION

The danger of cutting corners



The availability and use of copper clad aluminium (CCA) cable is a continuing cause for concern. Inside Networks has assembled a panel of industry experts to explain whether we are any closer to winning the war against CCA and suggest ways to avoid being duped into buying and using it

▶ While it's nothing new, copper clad aluminium (CCA) cable has become a genuine problem for the network infrastructure industry – one that in some quarters is yet to be fully understood and addressed.

Cables containing CCA conductors are still being sold as standards compliant products and their low price point can easily tempt installers to use them. There are documented cases of distributors supplying low-cost 'own brand' products and supplying CCA patch cords and solid-core horizontal cable stated as ISO 11801, TIA-568C or EN50173-1 standards compliant. To further enhance the deceit some have even been supplied with fake component compliance certificates.

Whether installers are buying them in the belief that they are the real deal or not is something of a moot point but the bottom line is that CCA cables are not compliant with recognised cable standards and, more worryingly, their installation can have disastrous consequences. Quite

simply, they don't perform as a 'proper' copper cable would. A couple of years ago tests on a 90m length of 'Category 5e' CCA cable revealed massive insertion loss and return loss failures and a DC loop resistance four times greater than the maximum allowed in the standards.

That's before we move on to the fact that in PoE applications they produce higher than expected temperature rises and could be a safety hazard. Very few of these cables have any form of genuine fire performance rating and because of a technicality none of these cables are able to conform to the Underwriters Laboratories (UL) fire grades.

Inside Networks has assembled a group of experts to discuss whether the battle against CCA is being won and suggest how to avoid it.

Don't forget, if you have a question that you would like a panel of experts to answer in Inside Networks, [CLICK HERE](#) and we'll do our best to feature it.

IS THE BATTLE TO STOP THE MANUFACTURE, SALE AND USE OF COPPER CLAD ALUMINIUM (CCA) CABLE BEING WON? HOW EXTENSIVE IS THE PROBLEM AND HOW CAN END USERS AVOID BEING THE VICTIMS OF MIS-SELLING?

MIKE GILMORE

TECHNICAL DIRECTOR AT THE **FIBROPTIC INDUSTRY ASSOCIATION**



Is the battle against CCA won?

No – and even if it was there are plenty of other counterfeit options to fight against.

The FIA became involved with CCA in mid-2011 and responded with a snappily titled white paper – The impact of cooper clad aluminium (and steel) conductors within balanced pair cables (intended for use within implementations of generic cabling – in October 2011.

Immediately, links to the document were requested from all over the world and emails from a complaining user base started to flood in both to the FIA and my office. Even now complaints of CCA cables being sold as Category 5, 5e and even 6 products continue to come in and I have a constant stream of cases where litigation is pending or threatened.

The companies distributing these products are well known to the wholesaler industry. The European cable standards body is now preparing documents based on our latest white paper – which may reduce the incidence of this fraud – but the electrical wholesaler community, and indeed the wider electrical contracting



world, is strangely quiet on this subject.

With regard to the extent of the problem, I am advised that in 2012 at least 3.6 million metres of CCA cable masquerading as Category 'X' was sold into the UK market. As the majority of this cable is sold into small installations, lots of potentially disgruntled customers may only discover long after the event that they have problems of connection reliability and excessive cable heating. Although I initially had some sympathy for the installers, who are typically small electrical contractors

who have been tempted to install data cabling, this sympathy has now almost completely evaporated.

How can users avoid being duped? To be completely clear, the construction of Category 5, 5e or 6 cables in accordance with any of the recognised standards for structured/generic cabling systems cannot employ CCA/CCS conductors. The cost of CCA cables is less than a third of the real thing. While we recognise that installation supply chains are complex involving all manner of subcontracts, all the FIA can say is that if something looks too good to be true, it probably is.



'If something looks too good to be true, it probably is.'

ROSEMARY MCGLASHON

EUROPEAN PRODUCT MANAGER AT 3M

“ Stopping the general manufacture of CCA is neither achievable nor desirable, because it is a general manufacturing technique/design used in other markets such as electrical transmission. It has its place, just not in the world of data cabling.

In the data cabling industry, CCA is not suitable for a Class D/Category 5e system nor more recent standards since, by definition, it is not 'solid copper', which is required in European, International and USA cabling standards such as ISO/IEC 11801, EN 50173 series and TIA 568 series. CCA has a number of transmission and physical disadvantages over solid copper which make it unsuitable for 'category' cabling.

Education is the best way to make the unsuitability of CCA cable for applications that conform to these standards apparent and to prevent its inadvertent purchase for data cabling. There have already been a number of relevant warnings and documents issued



from bodies such as the Communications Cable and Connectivity Association (CCCA) and the Fibreoptic Industry Association (FIA).

There are also counterfeit products – cable and components – in the market and avoiding the passing off of CCA as pure copper cable is a different issue to knowingly using it as a cheap alternative.

For the installer, protection comes from proper specification – references to the approved industry standards such as Category 5e and Category 6, etc. should be a sufficiently clear

indicator. Also, knowledge of the expected price for the cable being specified, buying from a reputable supplier or manufacturer, and sample inspection of the purchased cable against specification will help with identification.

For the end user, proper system specification and use of reputable designers and installers is essential. As with all purchasing – caveat emptor – let the buyer beware.

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KEN HODGE

CTO AT BRAND-REX

“ I have to start by saying that, in the right context, aluminium is a good material and finds many applications.

It could even possibly one day be suitable in structured cabling, but today it is not suitable at all. It is not compliant with the requirements or standards of an open structured network system, and presents a risk if installed. At best such cables compromise transmission performance and will deteriorate with time, while at worst they could even present



in a jack you risk the continuity. Moisture in the atmosphere provides the electrolyte and connected parts will corrode, making long-term reliability of connections questionable.

The major point in this argument is that the standards bodies do not allow aluminium conductor cables – there is no support for their use in open, interoperable, backwards compatible networks. Installers of CCA conductor cables are sentencing users to ownership of unsupportable, potentially unreliable, short-life networks that could

‘Installers of CCA conductor cables are sentencing users to ownership of unsupportable, potentially unreliable, short-life networks.’

a potential fire risk.

Aluminium has a higher resistivity than copper, so to achieve the same performance thicker conductors and larger cables are needed. However, purveyors of CCA cables make them the same size as copper ones, increasing the risks.

When used for PoE a typical temperature increase in a cable bundle will be, say, 10°C above ambient, with aluminium conductors that will double or even triple. Cables will therefore become hotter, presenting a risk to the current, and future, owners of an installed network.

At every point where you terminate an aluminium cable to an RJ-45 IDC

have major safety issues depending on current and future use.

Has it got a foothold? Yes, the product has undoubtedly gained ground, particularly in cost conscious Category 5e installations. Purveyors are marking and passing it off as ‘real’ structured cabling, which it’s very difficult to guard against. Some protection can be provided by asking for test evidence on the installation – checking the resistance is compliant – and for assurance that only standards compliant products have been used.

Another way is to simply insist on a good brand from a reputable manufacturer.



JUSTIN ELLIS

DATA CENTRE DEVELOPMENT MANAGER AT **COMMS EXPRESS**

“ The battle to stop the sale of CCA products is by nowhere near being won – in fact I’m not sure that it has even begun! The distribution channel has a vital role to play in this and that why Comms Express has launched its No Way to CCA campaign.

CCA cables are a massive blight on our industry and we should make a concerted effort to stop the manufacture and import of this cheap, inferior and hazardous product.

CCA cables have aluminium cores with a copper coating. Those of us in the industry understand the risks of using products that don’t comply with British or European standards. The poor flexibility of CCA cable results in numerous fractures and combined with aluminium oxidising means performance levels suffer.

Placing aside the inferior performance levels of CCA there is a raft of evidence and research that has highlighted the dangers of installing these inferior cables. Network engineers will tell you that when combined with PoE the higher resistant values of



aluminium will result in an angry can of worms, with the appropriate level of voltage missing.

With the price of copper at a premium worldwide it is absolutely no wonder that CCA cable does prove attractive, with its price point being much lower than solid copper. As with all industries, if there are opportunities to profit from inferior products then there are those willing to manufacture and sell, and sadly those that are willing to purchase it.

It seems that the only way to guarantee quality cable and network performance is to buy from well-known brands, distributors and resellers, not from dodgy websites with no backbone or history!

As the problem is so extensive we believe that by informing as many people as possible about the hazards involved we can help overcome the problem and help to get these products banned. It’s simple to protect yourself from purchasing CCA products – if the company you are buying from has nothing to hide they will not mind you asking ‘is it solid copper cable or CCA cable?’

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FRANK PERI

EXECUTIVE DIRECTOR AT CCCA

“ Four pair UTP category communications cables made with CCA conductors continue to be marketed in the US, despite the fact these cables do not meet TIA specifications nor the NFPA listing requirements for fire safety.

CCA cables are imported into the US from offshore manufacturers under lesser-known brand names. They may be considered counterfeit since they incorrectly show a 'category' designation, an incorrect fire safety listing, such as CMR or CMP, and may also display an unauthorised UL or ETL/Intertek mark. It is important to note that for certain other cable constructions and designs, CCA is permitted and completely functional.

While there is no hard data to quantify actual sales or market share, CCA cable is marketed vigorously in the US via websites, email solicitations and even advertising via LinkedIn. CCA cable has been offered at 50-



CCCA LinkedIn group, posting in other LinkedIn groups, and the sharing of relevant articles and videos with other organisations such as Inside Networks. These communications are available by [CLICKING HERE](#).

CCCA collaborates closely with UL and ETL/Intertek over unauthorised use of marks and possible trademark violations. UL

has been especially proactive in protecting its mark by issuing public notices on cables not authorised to display its mark. ETL/Intertek also started public notification on unauthorised use of its mark, including letters to regulatory organisations in the US and Canada. CCCA has also trained and alerted US Customs and law enforcement

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60 per cent below solid copper cable.

Progress to stem the encroachment of CCA has been made in a number of productive ways. The Communications Cable & Connectivity Association (CCCA) alerts and informs the industry about the problem through press releases, whitepapers, conference presentations, a CableCheck app to verify UL listings, newsletters, a

agencies.

The best protection for end users is to specify and then validate that their communications cable is from a well-known supplier with a well-recognised brand. Knowing and having the documentation to prove the cable's true pedigree is essential.

