

Case Study Copper Clad Aluminum

Learning from an Encounter with Counterfeit Cable Certification

Over the past six years, one computer educator and IT coordinator for a small K-8 elementary school, had been pushing for the school to upgrade its aging category 5 cabling infrastructure and limited data and wireless access points (WAPs). In 2013, the school board approved a \$25,000 network upgrade that included removing the old cable and installing approximately 100 category 6 work area outlets. Also included in the project was the purchasing and installing of new WAPs and network switches, removing an old telecommunications room, upgrading the current entrance facility with new network racks and cable management, and other miscellaneous upgrades.

The IT coordinator, who also owns a small company that provides part time support for K-8 schools in the area, was awarded the upgrade project. With an extremely limited budget, he was looking to save the school money anywhere he could. Through an online search and with a recommendation from another installer, he came across some inexpensive cable that claimed to be compliant with the *NEC* and *TIA-568-C* standards and verified by ETL. "I figured that if I could save the school \$50 or \$100 on every box of cable, that would add up to almost a \$2,000 savings that could be used for purchasing more wireless access points or other technology that the school desperately needed," said the IT coordinator. "The online supplier's price was enticing and the description for the cable was convincing—they used all the right terminology regarding compliance. I even contacted the supplier and

they assured me that the cable was of a high quality and that they had never had any issues."

While the cable was identified on the website as 23 AWG copper clad aluminum (CCA), the cable itself was also labeled as category 6 CMP-rated and as being in compliance with the standards. Being unfamiliar with CCA cable at the time, the IT coordinator decided to purchase 15 boxes of the cable.

"I hope others learn from my story and avoid getting into the same situation."

After running approximately 100 cables, he realized during the punch-down termination process that the twisted pairs seemed

rather brittle. It was during the testing of the links that he began to notice a problem.

"Of the approximate 100 cables, we had more than 30 errors, most of which were open pairs [lack of continuity]. Upon inspecting the terminations, we realized that several of the punched-down conductors were broken," he says. "We fixed the problems and started to test again, but more errors showed up on different cables. We then realized that simply moving the patch panel, faceplate or cables caused more pairs to break."

To further his investigation, the IT coordinator decided to terminate the cable on multiple vendor's keystone jacks and patch panels. The conductors continued to break. He then performed the same test with solid copper cable and did not encounter the problem. "I then stripped the CCA cable and bent the bare wire. It broke after one or two back-and-forth bends. In comparison, the solid copper cable took about 10 back-

and-forth bends before it broke,” he says. “This is when I knew there was a problem and that I needed to do some research about the cable I had purchased.”

After researching the cable, the IT coordinator realized that the issue primarily came down to fact that it was made using copper clad aluminum conductors. He came across multiple articles and white papers from the CCCA that provided him the information he needed. “Some of the articles were downright scary, describing the potential fire hazard when using CCA cable with PoE [power over Ethernet] and the liabilities associated with it not meeting fire codes,” he said. “I did not want to be the installer who burned down a school because I installed CCA cable. The day after I found out about the fire hazard risk, I immediately disconnected all the PoE connections. I also spoke with the physical plant manager, the school principle and other IT coordinators in the district, none of whom had ever heard of CCA cable.”

The IT coordinator contacted the CCCA for more information and for advice in resolving the problem. “The CCCA was very concerned about the cable and sympathetic to my situation. They taught me a lot about cables made with CCA conductors and how to verify the ETL and UL marks. I also learned that I was not the only one having issues with this cable. I even sent a few hundred feet of the cable to the CCCA so they could test it themselves,” he said. “Realizing that I had bought fraudulent cable, I contacted the supplier but they stood behind their return policy of 15 days and the fact that their cable description clearly stated that it was CCA cable.”

After several back-and-forth communications, emails and phone calls with the supplier eventually went unreturned. The IT coordinator’s credit card company was unable to remove the charge for the defective product due to the timeline, but thankfully reputable distributor Anixter donated new compliant cable for the school. The IT coordinator contacted ETL, who is looking into the fraudulent cable. He also filed a complaint with the Better Business Bureau and is awaiting a response. “Thus far, the CCCA has been very helpful and understanding to the situation. I am in the process of speaking with attorneys for a possible lawsuit against the supplier, and I am seeking any attorneys interested in taking on the case,” he said. “In the meantime, the only remedy is for me to remove the cable with the CCA conductors and install compliant cable with solid copper conductors—a tedious process that I have to complete at no charge to the school during nights and weekends.”

While the cable supplier in question has since removed its claims of compliance for the CCA cable, the IT coordinator has some words of wisdom for others regarding the purchasing and installing of network cable. “Network cable is a significant investment that will be in a building for many years. It is therefore important that the cable is of high quality and installed correctly,” he says. “The biggest lesson I learned is to never purchase CCA cable and to only purchase high quality cable and IT products from a reputable supplier. Make sure to know what to look for when buying cable, and learn and understand the terminology that goes along with it, such as who ETL and UL are and what the difference is between solid copper cable and CCA. I hope others learn from my story and avoid getting into the same situation as I did.”