smartlife
An IT Solutions Company

Solid Copper vs. CCA

Why the conductor matters, and how to tell what you are getting

Copper-clad aluminum, or CCA, is an aluminum wire with a thin copper coating. It is sold as network cable at a price solid copper cannot match, often with "Cat6" printed on the jacket. It is not category cable, it cannot carry a valid safety listing, and it does not belong in a commercial building. We do not install it.

THE SHORT VERSION

- Category cable must have solid or stranded copper conductors. CCA does not qualify, whatever the box says.
- CCA cannot be listed as CM, CMR or CMP, so it cannot legally be installed where rated cable is required.
- Its higher resistance wastes power as heat, which is a real problem for Power over Ethernet.
- Aluminum is brittle. CCA breaks at terminations and where it is bent.



The same wire, cut through. The difference is invisible from outside the jacket.

What the standards say

- **Performance standard.** ANSI/TIA-568, the standard that defines Cat5e, Cat6 and Cat6A, requires solid or stranded copper conductors.
- **Safety standard.** UL 444, the standard cable is tested to for its fire rating, requires copper conductors. CCA cable is not eligible for the listing.
- **Electrical code.** The National Electrical Code requires the conductors in communications cable to be copper, and requires listed cable inside buildings.

Put together: a cable made with CCA cannot honestly be called Cat6, cannot carry a real CMR or CMP rating, and should not pass an inspection. Printed markings on the jacket do not change what is inside it.

Why it fails in use

Property	Solid copper	Copper-clad aluminum
Electrical resistance	Baseline	About 55 percent higher for the same size
Power over Ethernet	Designed for it	Extra resistance becomes heat in the cable and less power at the device
Maximum reliable length	Full 328 feet	Often well short of it, especially with powered devices
Flexing and termination	Tolerates bending and re-termination	Brittle; conductors snap at jacks and plugs
Corrosion	Stable	Aluminum oxidizes where the copper skin is nicked, and connections degrade
Safety listing	UL listed CM, CMR or CMP	Not eligible
Weight of a 1,000 ft box	Roughly 25 to 35 lb for Cat6	Noticeably lighter

The failures are rarely immediate, which is what makes CCA costly. A link works on the day it is installed. Then a camera reboots on hot afternoons, an access point drops to a lower speed, or a jack stops working after someone moves a desk. Each is a service call, and the cure is to replace the cable.

How to tell what you have

Scrape a conductor
Draw a blade along a stripped wire. Copper is copper-colored all the way through. CCA shows silver under the surface.

Weigh the box
Aluminum is about a third the weight of copper, so a box of CCA is plainly lighter than copper cable of the same length.

Read the fine print
Look for "CCA", "copper clad" or "CCAM". Be wary of cable described only as "Cat6 compatible".

Check the listing
A real UL listing has a file number on the jacket that can be looked up.

Be suspicious of the price
Copper is most of the cost of a cable. Half the going rate is not a bargain on the same product.

Test it
A certification tester measures resistance and length and shows what a visual check cannot.

What Smart Life installs

Solid bare copper cable from manufacturers we know, with the jacket rating the space requires, and the documentation to show it. On a cabling project the cable itself is a small share of the total. Labor is the larger part, and labor is what gets spent twice when the cable has to be replaced.

If you already have CCA in the building

It does not all have to come out tomorrow. Prioritize the runs that carry power to cameras, access points and phones, the longest runs, and anything in an air-handling ceiling. We can test what is there and tell you which runs are the risk.

What we install in its place

Every data sheet states the conductor: solid bare copper.



Cat6 plenum cable
23 AWG solid bare copper
UL listed CMP.
Data sheet (PDF)



Cat6 riser cable
23 AWG solid bare copper
UL listed CMR.
Data sheet (PDF)



Cat6A plenum cable
23 AWG solid bare copper
UL listed CMP.
Data sheet (PDF)



22/2 sound and security cable
Stranded pure copper
CL3R riser.
Data sheet (PDF)

Planning cable for a building? Send us the floor plan or walk it with us. We will mark what belongs where and give you a written estimate.

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Part of the Smart Life low-voltage cabling series: Low-Voltage Cabling · Cable Grades · Solid Copper vs. CCA · CMP vs. CMR · Power Over the Cable · Cabling for Paging and Audio.