

Application note

Three reasons cabling certification is more important than ever

Every time you complete the installation of a structured cabling system, you can choose whether to certify it. All links in the system should be tested in some way to make sure that they're connected properly, but is it necessary to measure and document the performance of every link?

All cable suppliers say that if you want a long-term warranty on your installation, certification is required. There are other benefits for you as the installer, too: protection in case of disputes, quality control, even your reputation among your customers and the competition. Let's look at the value of certification for your projects in different situations.

What is cabling certification?

Certification involves connecting a device to each end of the cable, performing the appropriate measurements, and comparing those measurements against the limits described by the applicable standard or the customer's requirements. If all the measurements pass, the installed link passes. These results are typically documented in a report.

Certification testers are an investment, but they last a long time, so their cost can be amortized over hundreds of thousands — or even millions — of cables. (Contractors who don't test in volume can avoid this capital expenditure by renting testers or even hiring third-party firms to perform the certification.) The labor to perform and document the testing typically adds about 5% to the cost of a typical cabling installation job. Remember, however, that even basic connectivity or wire map testing requires a significant fraction of that labor to connect and test every link.



What are the standards for copper certification?

Certifying copper cabling is the process of determining whether the installed cabling performs in accordance with industry standards. In North America, the relevant organization is the Telecommunications Industry Association (TIA). Internationally, it's the International Organization for Standardization (ISO). For the TIA, these are commonly called "category" standards; the ISO calls them "classes." Cabling standards are related to, but not the same as network standards.

For a cabling link to be certified, it must be assembled from components (primarily cable and connectors) that have been certified to meet the appropriate standard. Testing of the installed link is critical to ensure that workmanship issues don't significantly impact the link's overall performance.

Cabling standard*		Max frequency specified	Supported network standards**					
TIA	ISO		10BASE-T	100BASE-TX	1000BASE-T	2.5GBASE-T 5GBASE-T	10GBASE-T	25/40GBASE-T
Cat 5		100 MHz	•	•				
Cat 5e	Class D	100 MHz	•	•	•	with limitations		
Cat 6	Class E	250 MHz	•	•	•	•	35 m max	
Cat 6A	Class EA	500 MHz	•	•	•	•		
Cat 8	Class I, II	2000 MHz	•	•	•	•		30 m max

Table depicting supported TIA and ISO network standards by cabling type

*TIA and ISO standards are not necessarily completely equivalent

**Support for 100 meter channels unless otherwise indicated

What are the standards for fiber certification?

While copper certification uses a small number of link performance limits, there are three different ways to specify limits in installed fiber cabling.

1. Reference the Institute of Electrical and Electronics Engineers (IEEE) fiber standards for different applications, such as 40GBASE-SR4. These standards aren't commonly used by installers, however, because upgrading to faster applications in the future would require retesting the system to those new limits.
2. Calculate the limits based on TIA specifications for the length of the fiber and the number of connectors in the link.
3. Calculate the limits based on the manufacturer's specifications for the fiber and connectors. These "engineered" limits are typically stricter than the TIA specs and support high-performance (low loss) fiber and connectors.

When cabling certification is required

If the job requires you to certify the cabling and report the results, there isn't much room for debate. Some customers demand the certainty that certification brings; others may want a long-term warranty (in many cases, 20 years or more) from the cabling supplier, which they can't get without a certification report.

When cabling certification isn't required, it's still beneficial

Is there any reason to certify a job when the job spec doesn't demand it? Certification offers benefits to the contractor, even if it's not required by the customer.

- It provides insurance to protect the installer from product failures and future disputes.
- It gives you the information you need to ensure that your installations — and your technicians — perform at the highest level.

The benefits of certification for the cabling contractor

We've all heard that most network problems are related to cabling. In the event that those problems appear, your customer will likely call you to help solve them. Certification provides a significant level of protection if things go wrong.

1. Proof that the work was done correctly:

Cabling problems can appear right away if the customer starts using the new system and experiences network problems.

Issues may also occur months or even years later. Network switches, routers, and servers get replaced many times during the life of the cabling infrastructure. You can count on any new networking equipment to demand more of the cabling system (requirements always get tighter as time passes). If what worked before works no longer, the cabling is likely to get the blame — and you'll be called in to help.

Certification reports can protect you by proving the work was done correctly. They can demonstrate to your customer that the cabling plant is as good as it was required to be. If a check of the cabling now indicates the performance doesn't match what you installed and tested, a money-losing callback can become a revenue-generating repair.

- 2. Finding bad cabling:** Bad cabling is out there, and certification provides additional protection against them. Some customers like to save money by specifying questionable materials. On rare occasions, a reputable manufacturer can produce a batch of marginal cabling. When you certify the cabling, you know what you're installing — you can even catch problems before you get too far into the job.

Testers such as the Fluke Networks DSX CableAnalyzer™ series will diagnose the problem in the connectors or the cable itself. If you end up in a dispute with a customer or a supplier, producing a passing certification report will usually end it. And if your DSX identifies the cabling as a source of the problem, most manufacturers will accept the result; if they show up to investigate the problem, it's likely the same tester that they'll bring.

- 3. Quality control:** Cabling manufacturers won't stand behind their warranties without proof of certification. It's the only way to assure that installation best practices are followed, and that installer workmanship meets standards. If you certify, you can stand behind your work the way the manufacturers do. You can even use certification as a point of differentiation from your competition. Certification data is also useful when it comes to assessing the performance of your team; it can help you identify your top performers and who needs additional training.

When is cabling certification worth it?

Many professional contractors always certify — not just for the reasons we've already cited, but also because a consistent approach to every job leads to higher quality for all jobs. Explaining the value of certification to a customer may let you include it your estimate and eliminate lower-quality competitors.

Even if you can't convince your customer, we hope we've convinced you: The protection and quality control that certification provides make it worth the modest cost. As one contractor told us years ago, "Certifying cables is like flossing your teeth: you only need to do the ones you plan to keep."

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