

# Partnering for Performance

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Structured cabling practices are overseen by the “Big Kahuna” of all standards, ANSI/TIA/EIA-568-B, Commercial Building Telecommunications Standard (which replaced the original TIA/EIA-568A in 2001). This specification was developed through the efforts of more than 60 contributing organizations, including manufacturers, end-users and consultants.

Our industry uses standards as a guideline to enable interoperability. The best known features or goals of the standards are to define cabling types, distances, connectors, cable system architectures, cable termination and performance characteristics, cable installation requirements and methods of testing installed cable.

Standards-built cable and connectivity products are designed to meet the minimum standards, which are defined as an open architecture. This means that any cable vendor’s products will work with any connectivity manufacturer’s patch panels, jacks and patch cords, as long as those individual components are built to meet the specified standard. And, when tested as a system (or channel), they will meet minimal channel parameters. Yet, sometimes meeting minimum is not quite good enough for emerging applications. Therefore, manufacturers have created technology partnerships to give customers better performance and increased warranties.

As an end user, specifier or installer, what should you be looking for in a structured cabling solution in regards to meeting (or exceeding) the TIA building standards?

## SHALL, SHOULD, MAY, MUST

First, let’s look at the rhyme and reason of building regulations. The very root

of TIA standards is to “enable the planning and installation of a structured cabling system for commercial buildings.” TIA/EIA-568-B standard “specifies a generic telecommunications cabling system that will support a multi-product, multi-vendor environment.”

TIA standards are guidelines and SHOULD be followed. But, these often get confused with codes, which MUST be followed. According to the BICSI *Telecommunications Distribution Methods Manual* (TDMM), codes have the force of law and regulatory powers. The purpose of codes, such as the National Electrical Code (NEC), are to provide “criteria to minimize the risk of electricity as a source of electrical shock or as an ignition source of fires and explosions due to electrical installations.”

NEC also requires material testing to meet specific test standards (such as cable jacketing) for flammability, smoke generation, opaqueness of smoke, and amount of toxic gasses under flame. These test standards provide uniform rules on materials and provide acceptable results. All products installed in commercial build-

ings must conform to the safety codes and are application independent. The TIA-568-B standard does not purport to address all safety problems associated with its use or all applicable regulatory requirements.

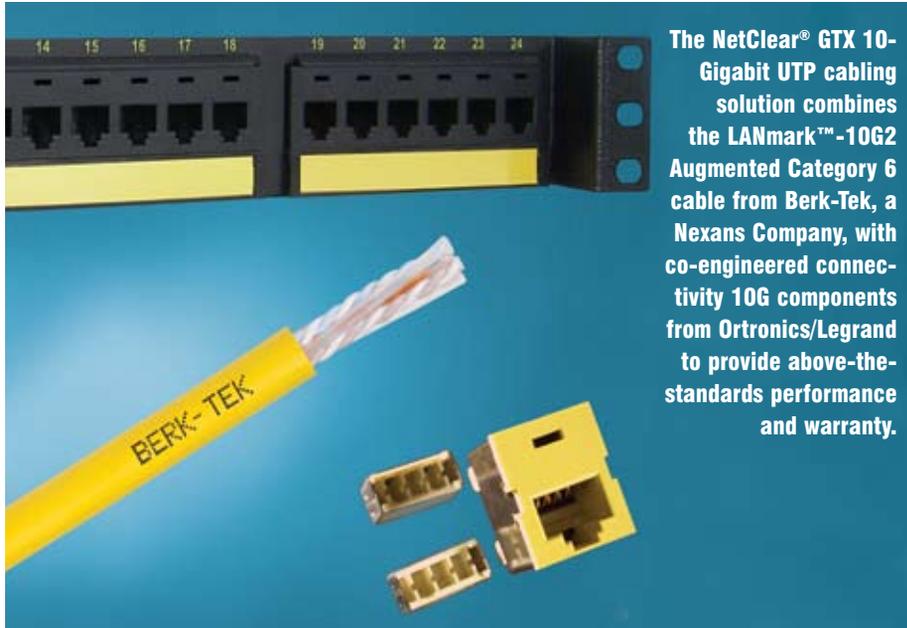
## STANDARD PARAMETERS

However, the TIA standards are application-independent and an addendum gets added each time technological advancements for the cabling system are made or required. The TIA-568-B is a living document and there are many addendums, along with many subcommittees (known as TR-42.x) that continue to update requirements, as needed. The original -B.1 defines general requirements, while -B.2 focuses on components of balanced twisted-pair cable systems and -B.3 addresses fiber optic cable and components in the structured cabling environment. The different B.2 classifications specify the performance of the cables as defined through frequency and bandwidth. B.2 addresses Category 5e (100 MHz), B.2-1 addresses Category 6 (250 MHz) and the proposed B.2-10 for proposed Category 6a (500 MHz). Table 1 details the different performance specifications for the UTP cables.

**TABLE 1: INDUSTRY STANDARDS PERFORMANCE COMPARISON**

FREQUENCY RANGE (MHZ)	CATEGORY 5E 1-100	CATEGORY 6 1-250	CATEGORY 6A 1-500
INSERTION LOSS (DB)	24.0	21.3	20.9
NEXT (DB)	30.1	39.9	39.9
PSNEXT (DB)	27.1	37.1	37.1
ACR (DB)	6.1	18.6	18.6
PSACR (DB)	17.4	23.3	23.3
RETURN LOSS (DB)	10.0	12.0	12.0
PSANEXT (DB)	N/S	N/S	60.0

# Reel Time



**The NetClear® GTX 10-Gigabit UTP cabling solution combines the LANmark™-10G2 Augmented Category 6 cable from Berk-Tek, a Nexans Company, with co-engineered connectivity 10G components from Ortronics/Legrand to provide above-the-standards performance and warranty.**

## BEYOND THE STANDARDS

Product quality is the single most important factor that the end user must consider when deciding upon a structured cabling system. Technical performance, as well as return-on-investment, runs a tight second. So, the question is, can standards-based, minimally compliant, structured cabling products provide enough margin to meet future applications? Most of the time, minimal is just not good enough. In addition, standards don't provide warranties.

Comparing standards-based products to products engineered to exceed the standards, may be like comparing apples to oranges, even though both are talking the same language – fruit. All these technology alliances within our industry may have different angles and advantages, but with one main objective – synergy for higher performance.

Whereas, these vendor partnerships have been called “marketing hype,” there are truths, mostly proven by third-party verification, that make a difference in the network's long-term performance, uptime and overall return-on-investment. As technology improves, there is an increase in the demand for bandwidth, which is the amount of data that can be carried from one point

to another in a given time. Basically, more data and faster. And with higher transmission speeds comes a reduction in the noise tolerance of the system. This is generally expressed in terms of signal-to-noise ratio (SNR), which can be improved when the cabling system provides headroom over the standard. The better the SNR, the lower the number of errors.

It's been proven that through co-engineering of matched cable and connectivity better channel performance results with a better performing network that encounters reduced bit error rates. An example of this is center tuning of plug/jack combinations. TIA provides targets (it actually looks like a target) for this component interface. It is up to the manufacturer where within the broad target area that they design their products.. One manufacturer may design to the left of the target while another may design to the right side. When mated, these components should meet the performance specifications, even though they are designed on opposite sides of the requirements.

But when manufacturers work together, as in the case of Berk-Tek, a Nexans Company, and Ortronics/Legrand's NetClear® cabling solutions, performance can be raised higher than the minimum standards. The careful matching of com-

ponents, called “center tuning,” eliminates unbalances between the cord and the connector and reduces the opportunity for noise to be introduced into the system. Co-engineering improves link and channel performance not only in long channels but also in short channels where these unbalances are likely to cause failures.

In addition to a better tuned, higher performing and more versatile systems, these partnerships include system warranties for both product and installation practices. The warranties come directly from the manufacturers. These warranty programs assure that the cabling system is installed and tested per the requirements of the standards and often offer comprehensive training for contractors. The length of the warranties can vary from one year to a lifetime, depending on the manufacturer.

## MINIMALISTS BEWARE

Individual components that are manufactured to standards will meet minimum requirements and test parameters. Even the standards state that “because of the diversity of applications, today and tomorrow, means that there may be cases where standards' limitations may occur. Therefore when applying these standards to the cable system, the user is cautioned to consult application standards, regulations, equipment vendors and system and service suppliers for applicability, limitations and ancillary requirements.”

So, before you select a cabling system, take a look at your network's life cycle. Take advantage of all options and experts available to you to protect your investment. Why settle for less? ■

**“Reel Time” addresses cable topics including both copper and fiber constructions, applications, installation practices and standards updates. If you have a particular cable issue, please send an E-mail to: [carol.oliver@nexans.com](mailto:carol.oliver@nexans.com) and we will feature the solution in an upcoming issue.**