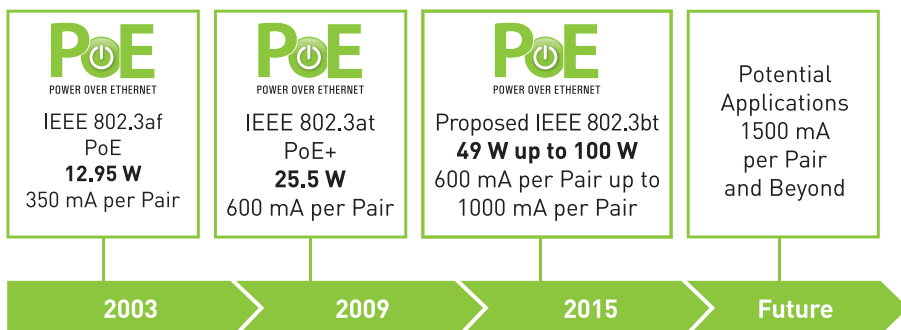


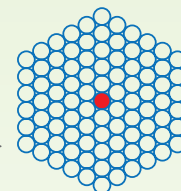
Category Cable Solutions for High-Power PoE Applications

Power over Ethernet technology (PoE) has been quietly gaining traction in the market ever since its launch in 2003, especially in Voice over Internet Protocol (VoIP) telephony & IP Surveillance camera. Today's PoE landscape has effectively split into two broad categories: standards compliant 24.5 W 802.3at and non-standard applications with higher power delivery capabilities such as Cisco's UPoE 60 W and HDBaseT's 100 W. These non-standard applications create a significant paradigm shift in what was thought to be possible with PoE. Power delivery through 1000 mA per pair and beyond is looming on the horizon and steps will be necessary to ensure continued compatibility with this rapidly changing environment.



As power is delivered through cabling, heat is generated in the cable. The method for quantifying cable heating performance is to conduct a 91-100 cable bundle test with a constant test current while

measuring the rise in temperature in the center cable as shown in the figure to the right. TIA has published a technical service bulletin, TSB-184:2009, recommending a maximum of 15°C heat rise in bundled cabling in order to ensure proper transmission performance and to prevent cable degradation. The IEEE 802.3bt standard is now under development with an expected power delivery of 49 W. However, since 2009 the PoE current capacity has increased from 600 mA per pair up to 1000 mA per pair in some applications.



The following table, as presented in IEEE 802.3 Working Group's "4-Pair Power over Ethernet Call for Interest" presentation, represents potential markets and applications of higher powered devices.

Applications	Expected Power Draw	Calculated Current Capacity*
Nurse Call Systems	50 W	500 mA/Pair
Point of Sale Devices	30-60 W	600 mA/Pair
IP Turrets	45 W	450 mA/Pair
Building Management	50 W	500 mA/Pair
Thin Clients, Virtual Desktop Infrastructure Terminals	50 W	500 mA/Pair
Video Conferencing	45-60 W	600 mA/Pair
IP Security Cameras	30-60 W	600 mA/Pair
Industrial	30 W	300 mA/Pair
Television & Media (HDBaseT)**	100 W	1000 mA/Pair

*General Cable calculated numbers based on estimated 50 V power supplying device.

**Example, as incorporated by General Cable, assumes HDBaseT's maximum available power output of 100 W.

The EfficienC™ Max Line of GenSPEED® Products

Cables Designed to Meet Future Developments of Higher Power 4P-PoE

Future-proof your infrastructure's PoE capabilities with the industry-leading performance of EfficienC™ Max cabling, designed specifically to meet the ever-increasing PoE standards and non-standard high-powered applications.

Large-Gauge Conductors for High-Powered Applications

The large-gauge conductors provide reduced heat generation, higher maximum current carrying capabilities and improved attenuation performance. According to TIA TSB-184:2009, minimizing the cabling temperature rise is recommended as it:

- Reduces the impact on the transmission performance (e.g., insertion loss) of the cabling
- Minimizes the need for auxiliary mechanical cooling in cable raceways and pathways
- Allows operation in higher ambient temperatures without exceeding the cable temperature rating
- Permits greater cable density and use of larger cable groups and bundles
- Reduces the overall cost of delivering power by minimizing the resistive heating loss [power dissipated in the cabling]

Cable Temperature Rating Beyond Standard Requirements

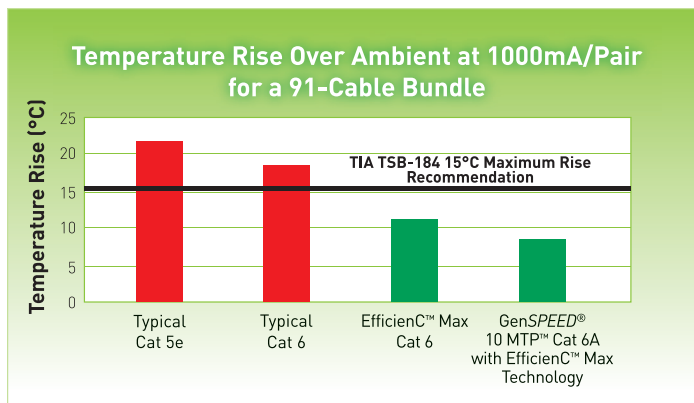
General Cable's EfficienC Max cable is rated to 90°C and constructed of 100% fluoropolymer insulation to offer higher protection against increased operating temperatures and:

- Surpasses the industry standard of 60°C
- Prevents material degradation from elevated temperatures over extended periods
- Reduces impact of high-powered non-standard PoE applications

*100 W value calculated assuming 50 V circuit per TIA TSB-184:2009 test method.



EfficienC™ Max Cat 6
& GenSPEED® 10 MTP™ Cat 6A
Featuring EfficienC™ Max Technology

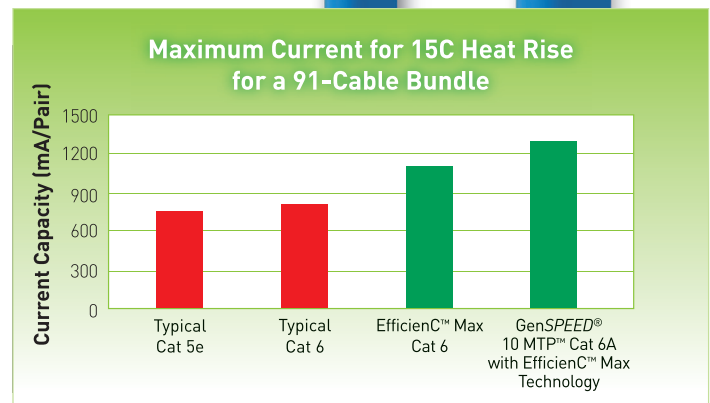


Temperature Rise

Based on 1000 mA per pair, traditional Category 5e and Category 6 cabling exceeds the TIA recommended temperature rise of 15°C. Utilizing General Cable's EfficienC™ Max line of cables, the temperature rise is mitigated based on innovative cable design.

In a 91-cable bundle, typical category 5e and category 6 cabling fails to meet the maximum recommended heat rise of 15°C at 1000 mA. **EfficienC Max Cat 6** offers a low-cost solution of efficient power delivery with performance exceeding the TIA recommended heat rise figures without having to incur Category 6A pricing.

If superior cable transmission performance is needed, as well as enhanced PoE performance, **GenSPEED® 10 MTP™ Cat 6A featuring EfficienC Max technology** offers current carrying capacity of 1250 mA per pair, allowing for a theoretical maximum of 125 W @ PSE and assuming 50 V power supply through all four pairs.



Maximum Current

Legacy cabling solutions do not typically have the ability to carry loads of 1000 mA per pair or greater without exceeding the TIA TSB-184 recommended 15°C max heat rise figures. General Cable's EfficienC Max line of products is designed for use in higher current loads while meeting this TIA guidance.