



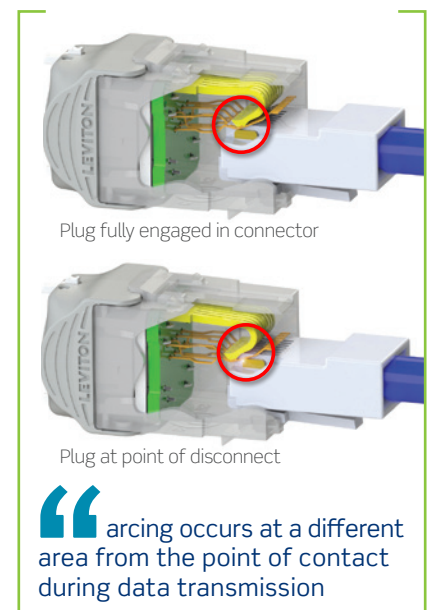
# Choosing Connectors for Power over Ethernet

New standards are under development that will pave the way for Power over Ethernet (PoE) up to 60 and 100 watts, expanding the types of devices and applications supported in the enterprise. However, higher-current PoE brings important cabling and connectivity considerations that should be addressed in order to ensure network performance. Cabling standards bodies are working to expand the potential of PoE while addressing safety and performance issues.

## Connection Integrity and Performance

One concern with higher current PoE is the potential for damage over time to RJ-45 connectors in the network. Specifically, when a patch cord is unplugged while the connection is energized, a small electrical arc can occur between the connector and the plug. During operation, the plug's contacts rest on the "knuckle" in the connector tines. Arcing occurs at the point where the plug's contacts separate from the connector tines during disconnect. While there is no immediate damage (and the arc is not dangerous to users), it can create pitting on the connector tines and patch cord plug contacts over numerous disconnections, weakening the integrity of the connection.

Leviton recommends using a connector that is designed to keep the connection point between the mated connector tines and plug at a distance from the point of arcing damage. Leviton has designed the geometry of its connectors so that arcing occurs at a different area from the point of contact during data transmission.



## Choosing Connectors for Power over Ethernet

Leviton lab testing confirms that the location of the pitting in its connectors is sufficiently far from the point of contact between the tines and plug when mated. This means that the pitting does not affect the electrical performance of the connectors within a channel, providing additional longevity.

Also, connectors and patch cords with 50 µm gold-plated tines should always be used, as specified by ANSI/TIA-1096-A and ANSI/TIA-568-C.2 standards. The cost of the gold is a substantial part of the cost of connectors, and there are companies that cut corners by not using gold on their connectors in order to offer them at a lower cost. These non-compliant options are more likely to fail when used for any application — including PoE.

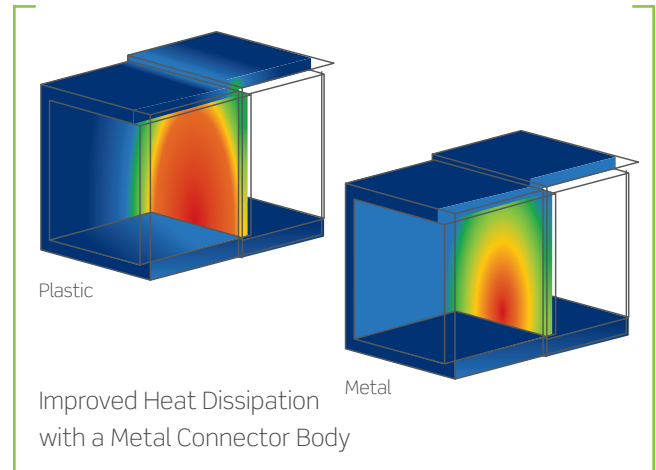
In addition, Leviton connectors include patented Retention Force Technology (RFT™), which maintains constant contact force at the connector and plug interface, preventing inadvertent intermittent disconnects caused by vibration or operational movement of the plug in the critical connector and plug mating region. The result prevents tine damage, saves on costly repairs and increases overall system longevity.

### Connector Performance Under Higher Temperatures

As with cable, temperature rise in connectors can also affect channel performance. Leviton engineers tested Atlas-X1™ connectors and patch cords against standards requirements. The connector was tested to the IEC 60512-5-2 Connectors for Electronic Equipment standard.

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The higher performance in the Atlas-X1 connector is largely due to its unique all-metal-body construction. Leviton testing found that a metal connector body dissipates heat 53 percent more efficiently than conventional plastic bodies.



Leviton also tested Atlas-X1 Patch Cords for compliance with the TIA TSB-184 temperature rise limit of 15 °C above ambient at 500 mA, and found its Cat 6 and Cat 6A cords maintained a temperature rise of less than 10 °C in bundled configurations.

High-quality connectivity is essential for attaining the performance and reliability needed in current and future PoE network operations. System components should be designed to minimize temperature increases and meet industry standards for performance and construction. This ensures system longevity and prepares networks for future upgrades and growth.

Leviton systems for PoE — including cable, connectors, patch cords, and patch panels — are component rated, and third-party tested and verified to exceed industry standard performance. Leviton Atlas-X1™ connectivity was successfully tested to deliver 100-watt PoE, enabling the transmission of power and data to a wider range of remote devices. The ability to deliver 100 watts supports the draft IEEE 802.3bt (type 4) PoE standard scheduled for ratification in 2018. System components have undergone rigorous lab testing to meet the need for higher bandwidth and power, while limiting the temperature rise in large cable bundles and remaining within the cable's listed rating.

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