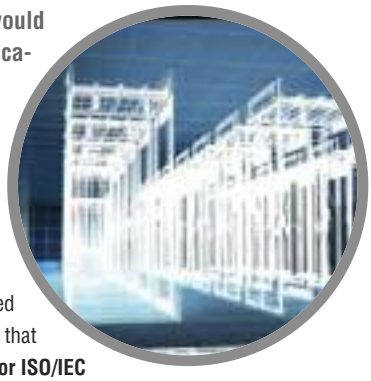
Short Length 26 AWG Data Center Solutions Equal Long Term Risks



Convergence, virtualization, and an improving economy are fueling tremendous data center growth. As would be expected, the increasing number of ports and congestion in today's data centers presents a new set of cabling challenges including:

- **Managing air flow for optimum thermal performance**
- **Maintaining proper pathway fill requirements**
- **Supporting advanced applications such as 10GBASE-T and PoE Plus**

Unfortunately, a recent trend in the industry is to respond to these challenges by deploying twisted-pair cables constructed from 26 AWG conductors over a restricted length channel topology. The trend is based on the idea that these cables' reduced outside jacket diameter will help alleviate thermal and pathway fill issues. The primary concern with this practice is the fact that these reduced-length systems are not Standards compliant. **Cables with 26 AWG conductors do not comply with <u>any</u> TIA or ISO/IEC Standard for horizontal cable requirements, all of which specify a minimum of 24 AWG (0.5mm) conductors. Any claim that these cables are category 6A, 6, or 5e compliant is a violation of the Uniform Commercial Code.**

As a result of the deficiencies imparted by the use of these smaller diameter conductors, the length of channels must be shortened (typically to 70 meters) to satisfy maximum channel insertion loss requirements. While this approach is commonly justified by the rationale that 100 meter topologies are not often deployed in data centers, there are multiple long term risks associated with specifying a cabling system that fails to meet one of the most fundamental mechanical construction requirements.

Risk: Support of Future Applications is Unknown

Should a future application be developed for operation over category 6A cabling, there is no assurance that channels constructed from 26 AWG horizontal cables will support it.

Risk: Power Delivery Applications Generate Excessive Heat

Horizontal cables constructed from 26 AWG conductors have significantly higher per unit length direct current or "dc" loop resistance than the maximum 0.25Ω per meter requirement specified by TIA and ISO Standards. These cables can exhibit dc loop resistance as high as 0.29Ω per meter. Depending upon bundle size, this **increased resistance may result in a temperature rise in excess of the maximum 10° C allowed by IEEE 802.3at for PoE Plus deployment; calling into question the ability of these solutions to adequately support power delivery.**

Excessive heat not only adversely affects the operation of electronic equipment, but can result in premature aging of the dielectric materials that are used in the cable jacket and conductor insulation. As targets for future power delivery applications increase from the PoE Plus level of 30 watts to proposed values as high as 100 watts, **compliance to TIA and ISO Standards requirements for per unit length dc loop resistance becomes extremely critical to avoid excessive heat generation.**

Risk: Reduced Flexibility for Future Growth:

The challenges that data centers are facing today are fueled by growth, but short length channel topologies ultimately restrict flexibility to accommodate data center expansion in the future. This is counterintuitive. **Standards specified cabling topologies provide the most flexibility for growth and support of new applications.**

Solution:

Reducing overall cable diameter is not the only way, nor the best way, to manage airflow and maintain proper pathway fill in the data center. These issues can be effectively addressed without the specification of noncompliant, reduced-length cabling systems that compromise applications support and future growth. Data center products such as Siemon's VersaPOD™ cabinet and cable management solution maximize air flow through specialized design features that include perforated front and rear doors, open base construction, air flow management between cabinets, and provisions for roof mounted cooling fans and additional accessories such as brush guards, blanking panels, and grommets that promote proper air flow and temperature control. VersaPOD also features an array of integrated horizontal and vertical cable management options that support high cable capacity in addition to a concealable pathway for cable routing and slack management. **With so many smart and flexible options available, it just doesn't make sense to take on the long term risks associated with short length cabling.**

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