

Pre-Terminated Fiber Solutions

Data centers are very quickly becoming the greatest opportunity for fiber optic solutions within the enterprise market. With advances in technology and applications that demand much higher bandwidth and connectivity, the data center environment requires higher densities without significant increases to the congestion in cable pathways.

Pre-terminated fiber cables are becoming increasingly popular because they provide higher reliability, greater densities, and manageable modularity – which increases flexibility of the solution. Increased connection densities of pre-terminated fiber cabling have proven to ease the cable load that data centers naturally provoke.



Pre-Terminated or Field Terminated

There are three foremost termination solutions: pre-terminated, field terminated, and spliced to pigtails. Regardless of which method is used, the objective of termination is to obtain the lowest possible signal loss at each connection. The process of attaching the connectors plays a large part in the performance of the fiber cabling. If the cores are not properly aligned and polished, transmissions may fail. In the past, splicing fibers to pigtails was the only way to get the advantages of a factory polished connector.

Correctly attaching connectors to the fiber cable is critical to meeting performance requirements for the installation. To attach a connector, the technician must first strip the cable down to the bare fiber. Anaerobic or heat cured epoxy is used to affix the fiber to the connector. After the connector is attached, the fiber must be scribed and polished. Finally, the entire assembly must be inspected and tested.

If this procedure is done in the field, it adds significant time and cost to the installation. Keep in mind that the amount of activity during the implementation of a data center often precludes having crews of workers installing connectors. In addition, once the data center is up and running, the sensitive nature of the data being processed restricts access to the floor area.

Pre-terminated fiber cables provide a solution to these problems.

Advantages of Pre-Terminated Cabling

Pre-terminated fiber cables are manufactured using precision manufacturing processes in a controlled environment at the factory. Precision and controlled environment are primary advantages of pre-terminated fiber. Factory terminations are much more consistent and use bench-top equipment in lieu of hand-held tools – resulting in lower insertion loss, better attenuation, and overall superior performance.

Pre-terminated fiber cables are typically used where the cable path is reasonably known. This explains why they are so popular in the data center, specifically in the main, horizontal, zone, and equipment distribution areas. Pre-terminated cabling can significantly reduce labor costs and installation time, while increasing port density and reliability.

Pre-Terminated Solution Components

Several components make up the pre-terminated solution for the data center. Pre-stubbed shelves and/or boxes – where a length of cable is pre-terminated on one end, attached to the shelves and/or boxes, and the connectors are plugged into the backside of the fiber adapter panels – offer a great solution when precise cable lengths are undetermined and it is undesirable to load the pathways with too much slack.

Connectors used on pre-stubbed shelves and/or boxes are usually LC, SC, or ST. Pre-terminating only one end of the cable provides most of the benefits of factory termination with the additional flexibility of not having to precisely engineer the length of the cable run in advance. The blunt end of the cable can then be cut to length and spliced into the back of another shelf and/or box that is pre-loaded with fiber pigtailed. This solution reduces the number of splices by half, and that can save a significant amount of installation time.

A pre-terminated cable assembly with LC, SC, or ST connectors on both ends completely eliminates field connectorization or fusion splicing. Shelves and/or boxes filled with adapter panels are installed at both ends of the link, the cable assembly is pulled into place, and the connectors are plugged into the back of the fiber adapter panels. During installation, the cable assembly connectors are protected with a pulling sock. In this case, the length of the cable run must be known before ordering the cable assembly.

The advantage of using this type of solution is the insertion loss of the channel is much lower than using MPO multi-fiber technology. You give up a certain amount of flexibility, but more than make up for it by ending up with fewer components, less cost, and lower insertion loss.

Conclusion

In order to ensure the reliability and scalability of your fiber optic installation, particularly in the data center environment, it is important to consider pre-terminated fiber solutions. The choice of cabling infrastructure greatly affects the cost of the installation in terms of materials, labor, and the potential for improper connectorization. Pre-terminated cables give the installer the best of both worlds, factory polished connectors and easy installation.



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