Tech Article

Fiber Cleaning Tools and Training Help Ensure 5G Reliability

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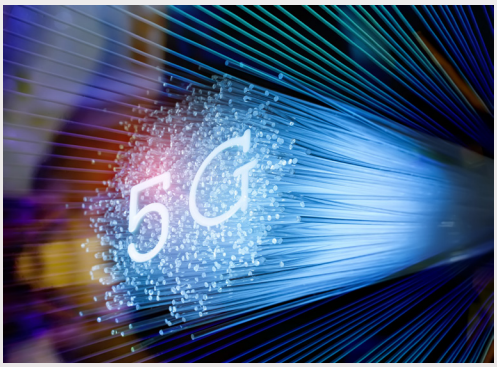

5G will soon reach 65 percent of the world's population.

Training is for anybody who specifies, installs or repairs fiber optic systems.

Fiber cleaning tools and training help ensure 5G reliability. 5G wireless technology is infiltrating networks around the world. Estimates suggest that there will be 1.9 billion subscribers by 2024 reaching 65 percent of the world's population. This makes it the fastest generation to roll out out on a global scale[1]. This new technology requires the extensive deployment of network infrastructure and the fiber optic cable which supports it.

To provide the faultless multi-gigabyte service and seamless streaming that 5G promises, the fiber used in these networks must support it. To ensure good fiber installation and maintenance, it is important to address the need for the trained technicians. The deployment of 5G networks will only be successful if there is a skilled workforce who understand the importance of cleaning and the correct way in which to perform the processes.

Train Technicians in Industry Standards

Contamination is a threat to optical networks. Cleaning fiber is an important task to help a network achieve its performance goals. So, engineers must know 'best practice' cleaning procedures to future-proof each installation. Re-training is needed to end any myths or misunderstandings of fiber cleaning. For instance, wiping a connector on a shirt sleeve or blowing away dust from an end face will not suffice. Each technician should use the same precise cleaning procedures to ensure exacting standards are consistently met.

An important standard which all technicians should know about is the international standard for inspection and cleaning fiber optic connectors, IEC 61300-3-35. This guides the fiber optic industry in determining what kind of contaminants could be on the ferrule end-face and how to clean them.

It defines contamination as a removable defect that negatively impacts the performance of mated connector pairs. A critical aspect all engineers should know is how important it is to inspect each end-face after cleaning and before mating to ensure any contaminant is removed. Failure to remove the pollutant causes cross-contamination of the ferrule end-faces disrupting the optical signal path.

Furthermore, particulate debris in the contact zone causes scratches and pits on both connector end-faces. For this reason, Section 5.3 of IEC 61300-3-35 recommends installers inspect the connector end-face, clean the end-face if necessary, and re-inspect the ferrule before mating. The total inspection process, using a digital ferrule scope, takes less than five seconds for an accurate analysis. The cost of cleaning and inspecting is less than 3% of the total installation cost of a new fiber network. The minutes spent cleaning and inspecting fiber end faces far outweighs the hours spent if the technician has to return to troubleshoot, identify, repair and clean faulty splices and connectors.

Go Back to School

The first step to understanding the IEC 61300-3-35 standards of efficient and effective fiber installation is training. Some technicians train 'on the job'. However, certified courses help ensure a standard operating procedure is applied every time. Plus, it gives engineers the competitive edge when it comes to installing new 5G fiber. There are many good, reputable training companies

A good fiber optic cleaning fluid is essential for cleanliness.

A cassette CleanClicker™ provides hundreds of cleans before needing replacement.

offering training sessions from beginning to advanced skills. Some training classes are online. However, it is important that technicians also attend on-location sessions to learn the “hands-on” skills needed.

Training is for anybody who specifies, installs or repairs fiber optic systems. This includes electricians, IT technicians, and communications techs. With training, students learn how to install and repair fiber optic systems. This includes both inside and outside plant operations. Training also covers using the special tools engineered to strip, clean, splice and test the quality of the connections. Many training companies also teach more advanced topics. Theses include troubleshooting systems, budgeting for damage losses, how to keep records and maintaining necessary documentation about the fiber optic system.

Tools of the Trade

Although training is important, so is using the correct tools for the job. One of the best ways to meet cleanliness standards like IEC 61300-3-35 is to use cleaning tools made for fiber optic applications. Better cleaning tools and procedures enable technicians to clean quickly and thoroughly, saving both time and money.

So, what are the essential ‘tools of the trade’? Let’s start with optical grade cleaning fluid. The easiest way to end contamination caused by an electrostatic charge is through a wet-dry cleaning process. Wet/dry clean with an appropriate, non-alcohol based optical-grade cleaning fluid. Select a cleaning fluid that will not leave residue, is static dissipating and comes in a hermetically-sealed container to prevent cross-contamination and spills. Also ensure it is fast-drying and nonflammable.

Use fabric optical-grade cleaning wipes and either a single-use connector cleaning stick or a more advanced “clicker” type cleaner. The clicker cleaner provides hundreds of cleans before needing replacement. Each type of cleaner fits the specific size connector in the network. Using the right cleaning stick or clicker ensures the absorbent tool removes oils and particulate contamination from the surface of the end face. They are soft enough not to scratch the ceramic or composite ferrule end face. Plus, they do not generate lint.

Finally, make sure to inspect the fiber. It is important to always inspect, clean and re-inspect the termini on both ends of a connector pair. Inspection should be performed even on brand new components since they often come from the factory needing cleaning before installation. The inspection process helps visually identify problems like permanent defects or any contamination that can interfere with, or damage, the surface of the optical termini.

Knowledge is Power

Training cuts future costs by reducing the problems caused by contaminated fiber connectors. By understanding proper cleaning procedures and improving skills and knowledge, technicians can confidently install and maintain 5G fiber and increase its reliability. Assemble the correct fiber cleaning tools required to install and maintain fiber. And provide technicians with the knowledge and training to ensure trouble-free fiber optic networks.

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[1] https://www.ericsson.com/en/mobility-report/reports/june-2019

About the author:

Jay Tourigny is Senior Vice President at MicroCare which offers precision cleaning, lubricating and debinding solutions. He has been in the industry more than 30 years and holds a BS from The Massachusetts College of Liberal Arts. Tourigny holds numerous U.S. patents for cleaning-related products that are used on a daily basis in medical, fiber optic and precision cleaning applications. For more information, visit microcare.com

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