

Application Note: Fiber Cleaning

Best Practices

When it comes to voice, data and video distribution, fiber optic cabling and connectivity provides high bandwidth performance over longer distances. As data transfer requirements **increase** the tolerances surrounding fiber optic connectors **decrease**. This creates special practices and considerations when deploying fiber.

Cleaning, cleaning, cleaning!

One of the most profound issues is fiber cleanliness. One particle of debris interfering with the fiber core of a connector can cause increased insertion loss, back reflection, and even damage the connector or high cost equipment. End caps (often misleadingly referred to as “dust caps”) are meant to protect fibers from debris and damage. While end caps minimize debris from getting to an endface, they also can contribute to contamination and do not guarantee a clean connector.

One common misconception is that pre-terminated “plug and play” fiber is automatically ready for use without any onsite preparation. While cleaning is performed before factory testing and packaging, there are many opportunities for the introduction of dirt, moisture and debris to contaminate end faces of fiber connectors and couplers once product is onsite.

Cleaning Best Practices

Before you patch, remember to:

- Inspect each fiber
 - Important - inspect ports in cassettes and coupler panels as well
- If dirt or debris is present, clean the fiber end face
- Re-inspect the fiber
- Make the connection

Cleaning Facts

- The most common cause of fiber system failures is contamination
- TIA, ISO and BICSI standards state that both field and factory terminated connectors, tests leads and jumpers shall be inspected and if necessary, cleaned prior to mating to other connectors or equipment
- Cleaning fiber is accomplished with a wet and dry system using 99% isopropyl alcohol and a lint free wipe or an approved cleaning system.

Cleaning and Testing during the manufacturing process

- Leviton’s manufacturing process includes use of the JDSU CleanBlast™ cleaning system on all pre-terminated assemblies and meets IEC 61300-3-5 standards to achieve the following tests:
 - 100% insertion loss testing on all pre-terminated assemblies
 - 100% return loss testing on all pre-terminated singlemode assemblies
 - Endface geometry analysis on all MTP connectors after termination
 - Polarity for multi-fiber assemblies

Application Note ID:
NSAN-13-0001-051413

Date:
05-14-13

Product Line:
Fiber Optics

Part Numbers Affected:

Opt-X Standard, E2XHD,
Opt-X HD and Unity
Cassettes

FastCAM, FastCure,
Threadlock and Secure
Keyed LC connectors

All pre-terminated fiber
optic cable assemblies
and patch cords

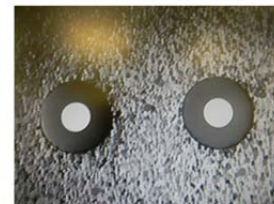
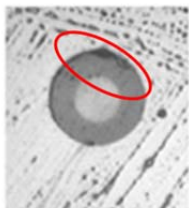


JDSU CleanBlast system

Onsite factors

- Dust (due to construction or high traffic)
- High humidity (airborne contaminants mixed with condensation) or Low Humidity (very dry climates leaving dust in the air)
- Dirty or contaminated end caps
- Improper handling, cleaning methods or cleaning products
- Oils, moisture or other contaminants due to contact with skin or saliva

Video scope captures of a dirty and clean fiber optic SC and MTP connectors



Inspection in the field

- Prior to final testing optical fiber installations and/or performing patching, all optical connectors shall be visually inspected with a microscope (min x200) to ensure that the end-face is smooth, clean and free of scratches, fractures, or contaminants



200x Inspection Scope
#49886-FSP



MTP Scope Adapter
#49886-MCS



LC Scope Adapter
#49886-LCS



Duplex LC Scope Adapter
#49886-LCD

MTP connectors

- MTP connectors contain multiple fiber strands in each connector
- The surface area is larger providing an even greater possibility of contamination
- Sequential failed test results when testing strands within the same connector often indicate a dirty end face

MTP cassettes and Fiber Optic adapter plates

A common oversight is not cleaning the adapters and connected fibers in cassettes and patch panels

- Pre-terminated cassettes can contain contamination on the internal connectors
- Fiber strands connected to the backside of an adapter plate may transfer contamination to the connector being inserted or vice versa
- Cleaning tools are available to clean a connected fiber through an adapter such as the MTP cassette cleaning tool and LC/SC cleaning tools below

Leviton cleaning products

Leviton offers a complete line of cleaning products both “wet and dry” and dry systems for all connector types and cassettes.



Alcohol Cleaning Pads
#49886-APD

Lint Free Wipes
#49886-DWP



MTP Cassette Cleaning Tool
#49886-MCT

LC Cleaning Tool #49886-LCT

SC Cleaning Tool #49886-SCT

MTP Cleaning Tool #49886-UxT
("F" for female, "M" for male)

Summary

While it would appear to be time consuming and expensive, proper fiber cleaning and maintenance practices will minimize troubleshooting, replacement of products and associated downtime. Consistent, best practices will ultimately lower installation and ownership costs. For more information or assistance with fiber optic solutions, contact Leviton Technical Support.

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