Fiber Connection Cleaning Best Practice Recommendations

With the deployment of 40G and 100G systems in the data center reliable and efficient fiber installations are critical to the high performance network.

Contaminated fiber optic connectors can often lead to degraded performance and costly, but preventable failures. In industry studies the #1 cause of link failure is a contaminated or dirty connector or fiber. To ensure proper performance and reliability care must be taken with the installation and maintenance of removable fiber connectors. Ideally, a properly maintained and cleaned fiber optic cable will help reduce contaminant transfer to a removable or non-removable optical interface, lessening or removing the need to clean expensive and delicate gear. Cabling industry best practices recommend that both field and pre-terminated connections should be inspected and cleaned prior to mating to other connectors or equipment.

Fiber Optic Cable Cleaning

Dust and oils are the two most common forms of contamination on fiber connectors and can come from a variety of normal maintenance activities. Oils from your fingers will leave a noticeable defect easily seen with the use of a fiber scope, the oil will also tend to trap dust against the fiber, which can result in scratches on both the fiber connector and the optic it is being mated to. Inserting and removing a fiber tends to create a small static charge on the ends, which can result in the attraction of airborne dust particles. Simply removing and re-inserting a fiber has the possibility of contaminating the end of the connector in a facility that may have a higher level of dust (newly constructed or renovated data centers). Fiber caps, which are used to prevent fiber ends from being scratched while not seated in a connector, will collect dirt, oil and dust, transferring those contaminants to the fiber when used. Caps should still be used when storing or pulling fiber cables, but the ends should be cleaned before inserting them into an interface. It is also important to note that a new cable **does not** guarantee a clean cable.

It is not just important to have the proper tools for the job, but also know when to use them. In the case of cleaning the ends of a fiber optic cable, the recommendation is before you plug the cable into a connector, as often as possible. Fortunately the tools to clean fiber connectors are both cheap and easy to use. There are two types of cleaning tools, depending on the need and the type of fiber connectors, a reel cleaner for LC/SC type fibers and an MPO/MTP connector cleaner. A reel cleaner can also be purchased for MPO/MTP cables, but the specific MPO/MTP tool is superior in its ability to clean both the connectors and the endpoints.

Figure 1: Reel cleaner (left), MTP/MPO cleaner (right)

A reel cleaner contains a refillable lint free reel of cloth that is moved after each cleaning, always presenting a clean surface. There are multiple types of cleaners with different reel's that are meant to clean a wide variety of connectors.

The MTP/MPO cleaning tool comes with a barrel on the end for cleaning both connectors and endpoints. It works in the same way as the reel cleaner with a refillable "tape" used to clean but works on both the fiber and the port allowing for quick and easy cleaning.
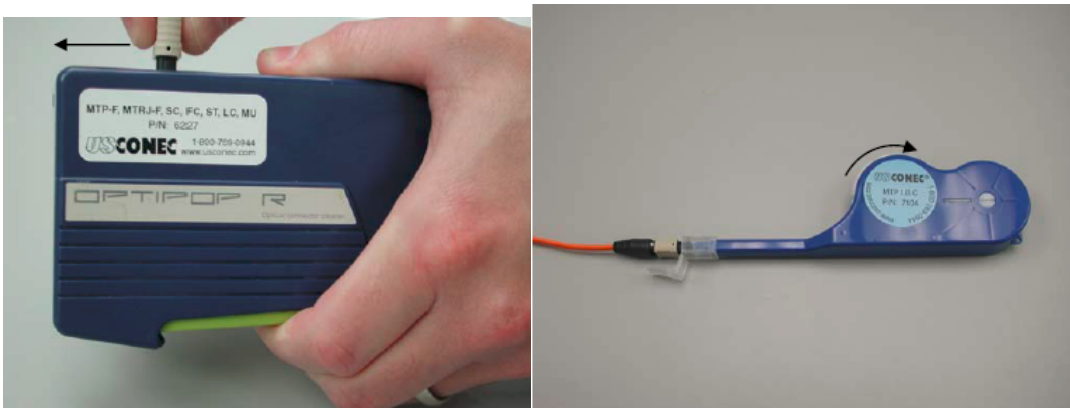

Figure 2: Proper use of reel cleaner (left), MTP/MPO Cleaner (right)

MXP Port and QSFP Connector Cleaning

In most situations it is preferred to focus your cleaning on the fiber connectors themselves. A clean fiber optic cable will help prevent the need to continuously clean the ports optical endpoint removing the chance of scratching or compromising a much more expensive piece of equipment. Cleaning MTP/MPO endpoints was covered earlier, and can be performed with the same tool that cleans the cable ends.
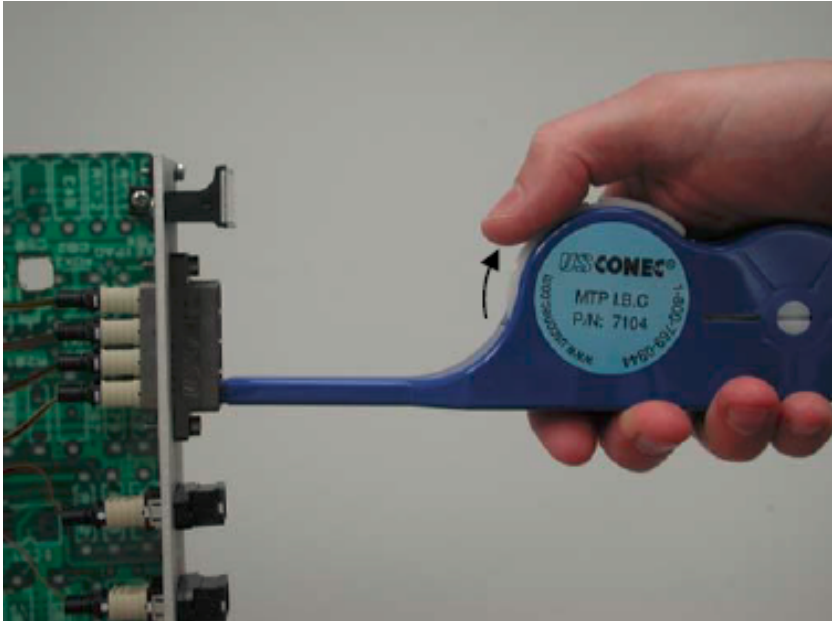

Figure 3: Cleaning the MTP/MPO adapter or transceiver

Cleaning connectors that aren't MTP/MPO, for example LC/SC connectors, can be accomplished by using a similar style connector cleaner that will slide into the port and pressure will cause "click", cleaning the port. Note, for pinned connections a different tool that accommodates the pinned adapter is required.

Figure 4: Connector cleaner for cleaning LC/SC type optical interfaces

Where to Buy Cleaning Equipment

There are many commercial solutions available from many reputable sources that supply test and inspection equipment, and fiber optic cleaning supplies. The following is a short list of suppliers.

http://www.flukenetworks.com
http://www.leviton.com
http://www.te.com
http://www.cdw.com

It is highly recommended that a data center facility implement cleaning procedures for all fiber optic connectors to reduce link failures and unnecessary replacement of expensive and critical network equipment.