

Tutorials Of Fiber Optic Products

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CATEGORY ARCHIVES: FIBER OPTIC POLISHING

Fiber Optic Connector Polishing



Overview

In previous articles, we have mentioned of the [connector cleaning](#). And we know any contamination in the fiber connection can cause failure of the component or failure of the whole system. [Fiber optic connector](#) is an important component in fiber connection. And today, I want to introduce the fiber optic polishing in this article. As we know, fiber optic cables require end-surface treatment for proper light transmission. Polishing is an essential step for almost all glass-based fibers with cladding and diameters larger than 200 microns and all fiber optic connectors also need polishing. So, why do we need fiber optic connector polishing and what types are there of fiber optic connector polishing? We will describe in the following.

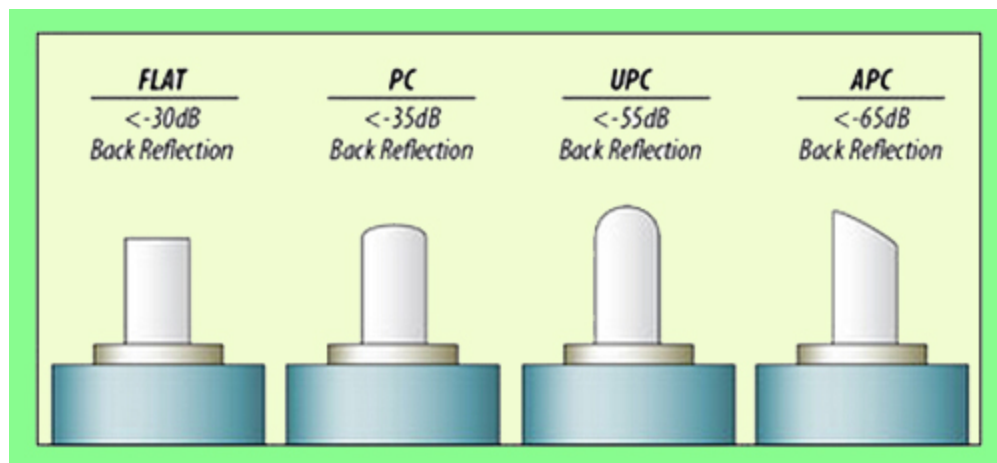
Why We Need Fiber Optic Connector Polishing?

It is known that, once the fiber optic cable is terminated with a particular connector, the connector end-face preparation will determine what the connector return loss (we generally call back reflection) will be. The back reflection is the ratio between the light propagation through the connector in the forward direction and the light reflected back into the light source by the connector surface.

It is very important to minimize the back reflection in high-speed and analog fiber optic links, utilizing narrow linewidth sources such as DFB lasers, which are prone to mode hopping and fluctuations in their output. Polishing is one of the essential procedure to make fiber optic connector work perfect. That's why we need fiber optic connector polishing.

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Fiber Connector Polishing Ways

There are several different polish options on the fiber connectors. Due to the extreme accuracy requirement of today's fiber connections, polishing is mostly done by a machine, especially for the production. But there are also some of non-production types of terminations still done by hand.

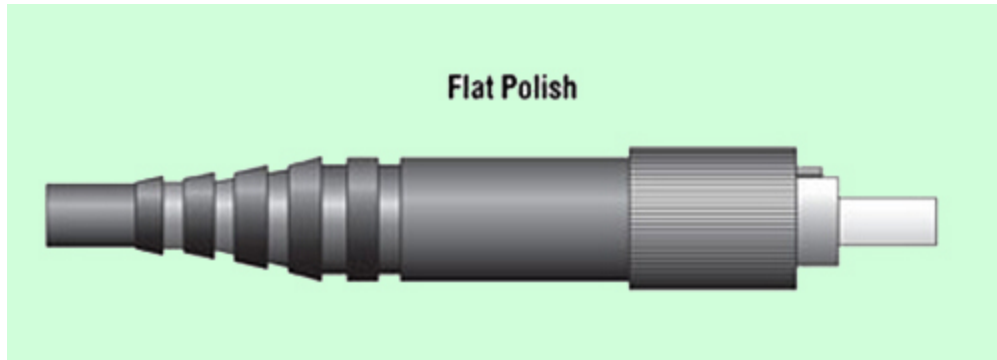
The common machine polishing tools, such as fiber optic polishing machines and other fiber optic polishing machine kits including fiber polishing fixture for all types of fiber optic connectors. while the manual fiber optic connector polishing will need polishing paper and fiber optic polishing puck or some cleanser. Some of the [fiber optic polishing tools](https://www.fiber-optic-tutorial.com/category/network-solutions/fiber-optic-polishing) look as the following picture.



Polish Types/Typical Back Reflection

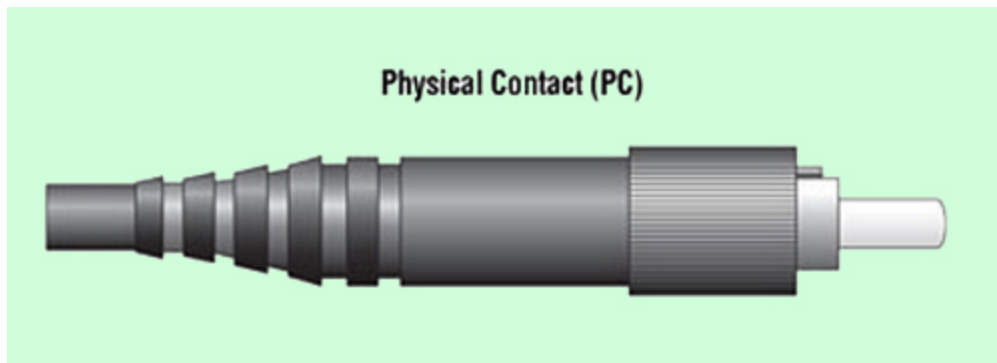
1. Flat Polished(Flat)

A flat polished connector has zero dome-shaped geometry.



2. Physical Contact(PC)

PC connector is polished in a dome-shaped geometry to maximize the signal transmitted at the connection.



3. Ultra Physical Contact (UPC)

The ultra physical contact describes connectors that undergo extended polishing to render the fiber end-face more suitable for optical contact with another fiber than an ordinary PC connector.



4. Angled Physical Contact (APC)

Angled physical contact connector is polished on an 8° angle. When compared with a normal "physical contact" (PC) connector, an APC connector exhibits better reflected properties, because the angled polish reduces the amount of light reflected at the connector interface. Connector types available with an angled polish include SC, ST, FC, LC, MU, MT, and MTP.



Conclusion

Fiber polishing is as much a science as it is an art. To a certain extent, proper polishing of fiber optic polishing is critical for optimum results. However, it also depends on your polishing machine or your own technique. So do not just working like horse, select the right machine or the right company for your fiber optic connector and polishing tool.

Warm Tips of The Author: You can buy all kinds of fiber optic connectors and polishing machine or polishing kit in [Fiberstore](#) with confidence. The high quality products will help you to make a good performance in your fiber connection.



This entry was posted in Fiber Optic Polishing and tagged fiber optic connector polishing, fiber optic polishing, fiber optic polishing puck, polishing fixture, polishing machines on November 5, 2014 [<https://www.fiber-optic-tutorial.com/fiber-optic-connector-polishing.html>] by Admin.

Guide To Fiber Optic Polishing



Optical fibers require end-surface treatment for proper light propagation and that includes polishing their ends. Polishing is essential for almost all glass-based fibers with cladding diameters larger than 200 microns. Furthermore, all fiber connectors require polishing. The process of [fiber optic polishing](#) can occur in the field or in a technical lab, it employs a range of tools and products used to create precision fits and finishes in the delicate glass ends.

There is typical [fiber optic polisher](#) for fiber optic polishing. Fiber Optic Polishing Machines are used to polish the end faces of fiber optic products (cables, connectors, adapters, etc.) in order to minimize signal losses due

to scattering. Polishing machines can increase productivity by providing rapid polishing of many different connector styles.

When selecting a fiber polishing machine, there are several features to consider, including adjustable pressure, changeable holders, a timer, and the ability to request custom specifications. Most polishing machines do not offer the flexibility of speed adjustment. This is partially due to the fact that most users only need to handle one type of ferrule material such as zirconia. A slight speed variation does not have significant impact on connector polish result. However, a versatile polisher should have the capability to change speed according the ferrule and polishing film material.

The polishing job typically involves fusion splicer, among other [network crimping tool](#) and connectors are needed. It also requires 99% isopropyl alcohol, polishing (lapping) film and pad, a polishing puck, and epoxy or adhesive. Some technicians also find needle, syringe, and piano wire useful.

Several Different Polish Options On Fiber Connectors

The different polish of the fiber optic connector ferrules result in different performance of them, mainly on the back reflection (return loss). Generally, PC type is required at least 40dB return loss or higher, UPC is 50dB or higher, APC is 60dB or higher. (As we know, the higher the return loss, the better the performance). Insertion loss of them all should be less than at least 0.3dB, the lower the insertion loss the better the performance.

Things You Need To Mind During Fiber Optic Polishing

It is important not to dwell on any polishing film longer than necessary. Too much polishing can result in undesirable ferrule length, unnecessary polish film wear, and degraded polish finish due to particle accumulation. Make proper adjustments to the recommended polishing time in each step in case they are less than ideal.

Eye protection is always necessary to protect against powerful industrial lasers used in long-distance single-mode networks. Supporting tools may include a visual fault locator to troubleshoot fiber faults and breaks. A fiber-optic inspection microscope permits precision analysis of hair-fine fibers. Additionally, technicians rely upon jacket strippers, cutters, cable slitters, and fusion splicers.

Conclusion

Fiber polishing is a science but much like an art. The science of polishing is crystallized in a well designed machine while the art of polishing reside in the procedure and the continuous effort for improvement by the individual user. The procedure and the training are just as valuable as the polishing machine.



This entry was posted in Fiber Optic Polishing, How To and tagged cable crimping tools, fiber optic fusion splicer, fiber optic polishing, fiber polishing machine on July 17, 2013 [[https://www.fiber-optic-](https://www.fiber-optic-tutorial.com/category/network-solutions/fiber-optic-polishing)

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