

# Controlling Static on Fiber Optic Networks eGuide

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# End Face Static - Common Causes

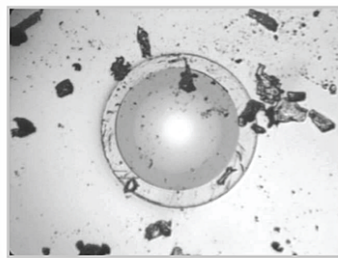
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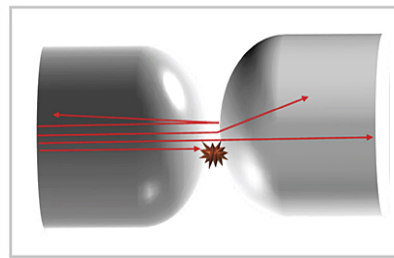
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## End Face Static – Common Causes

End face static most often comes from contact friction. Plastic, ceramic, or glass end faces don't have a path to ground so these triboelectric charges can't dissipate. Dust stubbornly clings to the outer regions of the connector and at the ferrule apex in the contact zone causing signal interference or signal loss. Here are the most common sources of static.



Dust contamination on an end face.



Dust causes signal interference.

**Dry Wiping** Using a dry wipe or cleaning stick creates static and attracts dust.

**Air Dusters** The rapidly moving air from the canned duster creates friction and delivers an electrostatic charge to end faces.

**Connector Mating** Inserting or removing an end-face connector into the adapter during mating creates static and produces wear debris including dust and other particles.

**Cap Removal** An installer removing the protective end cap from a new end face in the field generates static and attracts contamination.

**Network Testing** Connecting an end face to an inspection scope, power meter or light source creates friction, and static.

*Avoid static problems by using the wet to dry cleaning method using high-quality, static dissipating fiber cleaning fluids and tools.*



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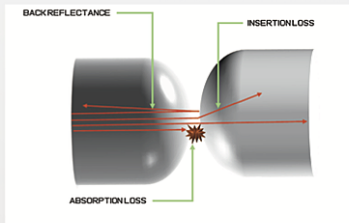
# Wet to Dry Cleaning Methods

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Tech Article

## Wet to Dry Fiber Cleaning

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- Industry: Fiber Optics
- Published: *Sticklers Resources*



Contaminated end faces can cause back reflectance, absorption loss and insertion loss



Sticklers Fiber Splice & Connector Cleaner breaks the static bond between the soil and the surface



**Scope:** Based on MicroCare™, LLC and *Sticklers* Lab studies, fiber optic end face cleaning of patch cords, adapters, alignment sleeves and transceivers using wet to dry methods is proven to be most efficient and effective. This document expands on the testing and discusses best practices for fiber cleaning tools and products produced by *Sticklers*.

### Industry Issue

The telecommunications industry has been converting over to fiber optics for years. As the need for speed has driven the expansion of the technology, the need for pristine clean end faces has followed. End faces on fiber optic ferrules are the connection point along the line and thus need to be clean to allow the light to flow uninterrupted. The light should not get absorbed (absorption loss), reflected back to its original source (back reflectance) or refracted (insertion loss), in any way. A microscopic dust particulate, an accidental small touch from a finger, or even the removal of a dust cap (off-gas residue), can attribute to a non-clean ferrule end face causing frequency signal loss if not removed.

Technically speaking, when interference of the frequency or refractive index of the light changes, a phenomenon known as chromatic aberration exists. Thus, changes in the refractive index result in a change in incoming frequency signal. In layman's terms, if the light in the fiber optic line is refracted/reflected, then there is a significant loss of data transmission. All fiber optic lines on a network essentially have an acceptable loss budget. Any contamination on ferrule end faces makes that budget hard to achieve.

Further exacerbating the clean issue is that electrostatic charges are often found on surfaces from wear debris due to contact friction of connector parts, charged particles from test equipment, cooling fans on network gear or internal building HVAC systems. Electrostatic charges, also known as Triboelectric effect, can remain on the ferrule surface if not discharged.

### Ferrule Surface Issues

- Dry cleaning tools combined with atmospheric conditions can add electrostatic energy to the surface. Plastic on plastic insertion wear of the mated connector pair, plastic cleaning tools that do not have ESD safe materials, the rubbing of some dry cloth, for example, polyester, materials across the surface of the ferrule and charged particles from cooling fans all contribute to a charged electrostatic surface with no way to discharge. A charged ferrule surface will attract dust particulate which negatively impacts the insertion loss of the mated connection. People have seen dust particulate under a microscope "dance" across the ferrule surface. When electrostatic energy exists, it must be dissipated since there is not a method to ground for these charged particles. Cleaning fluid, using the wet to dry cleaning method, will act as a dissipative medium to allow that charge to disappear.
- Wetted materials that are pure in nature can enhance the cleaning capability of the surface. For example, solvents can break the bond of the soil and the surface allowing a cleaning cycle to be minimized. This is true with the *Sticklers* Fiber Splice & Connector Cleaning Fluid. Due to its hermetically sealed container, the purity level of the fluid and its natural ESD properties, this fluid is perfectly engineered to clean ferrule surfaces.

# Choose Your Wet to Dry Cleaning Tools

See All Tools



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## Wet to Dry Cleaning Tools

Wiping dry on a fiber end-face generates a static charge that is difficult to dissipate. Both IPC and iNEMI agree, wet to dry cleaning delivers cleaner connectors and a more robust network.



### CleanStix™ Cleaning Sticks

Moisten the stick tip with Sticklers™ Fiber Optic Splice & Connector Cleaner (do not saturate). Rotate 6 to 8 times in same direction inside the termini.



### CleanClicker™ Connector Cleaners

Apply a small dab of fluid to an optical grade wipe. Press the tip of the CleanClicker™ onto the moistened section of wipe. Do NOT apply fluid directly to the cleaning tool.



### CleanWipes

Wet the wipe with a Sticklers™ Fiber Optic Splice & Connector Cleaner then wipe the end-face from wet to dry area of the wipe.

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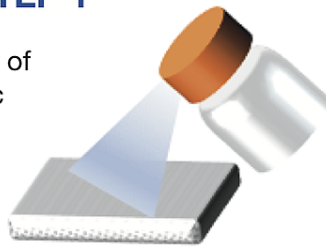
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# How to Wet to Dry Clean with a Sticklers™ CleanClicker™

## How To Wet to Dry Clean with a Sticklers™ CleanClicker™

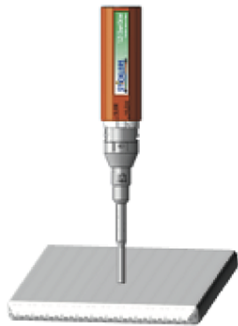
### STEP 1

Apply a small amount of Sticklers™ Fiber Optic Splice & Connector Cleaner to an optical grade wipe



### STEP 2

Touch the tip of the tool into the wet spot on the wipe



### STEP 3

Engage the cleaner one time to clean the end-face



### Advantages of Wet to Dry Cleaning

The cleaning fluid breaks up contamination and improves the cleaning performance  
The cleaning fluid dissipates static charges that attract dust based contamination



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1.25mm CleanClicker™

2.5mm CleanClicker™

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Splice &  
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## Controlling Static FAQs

[Why is Static a Problem on Fiber End Faces?](#)

[Should I be Worried About Static-Charge Fiber Cleaning Tools?](#)

[Wet to Dry Cleaning – What are the Advantages?](#)

[How Does Dust Cause Signal Loss Between Mated Connector Pairs?](#)

## Further Reading

[A Sticky Situation: Removing Electrostatic Charges Improves Fiber Network Performance](#)

[Dealing with the Effects of Static on End-faces and Connectors](#)

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