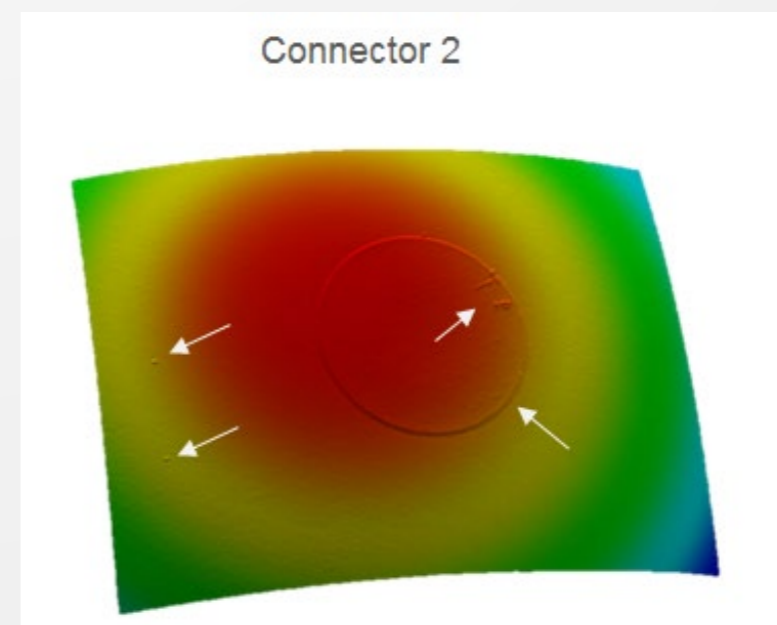
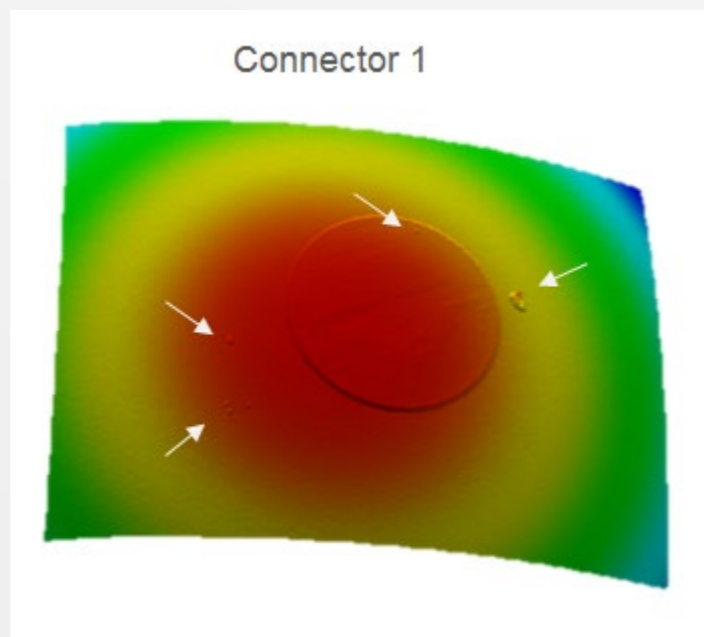


## Best Practices for Cleaning MT & ARINC 801 Connector Systems



# End-Face Contamination on Virgin Connectors

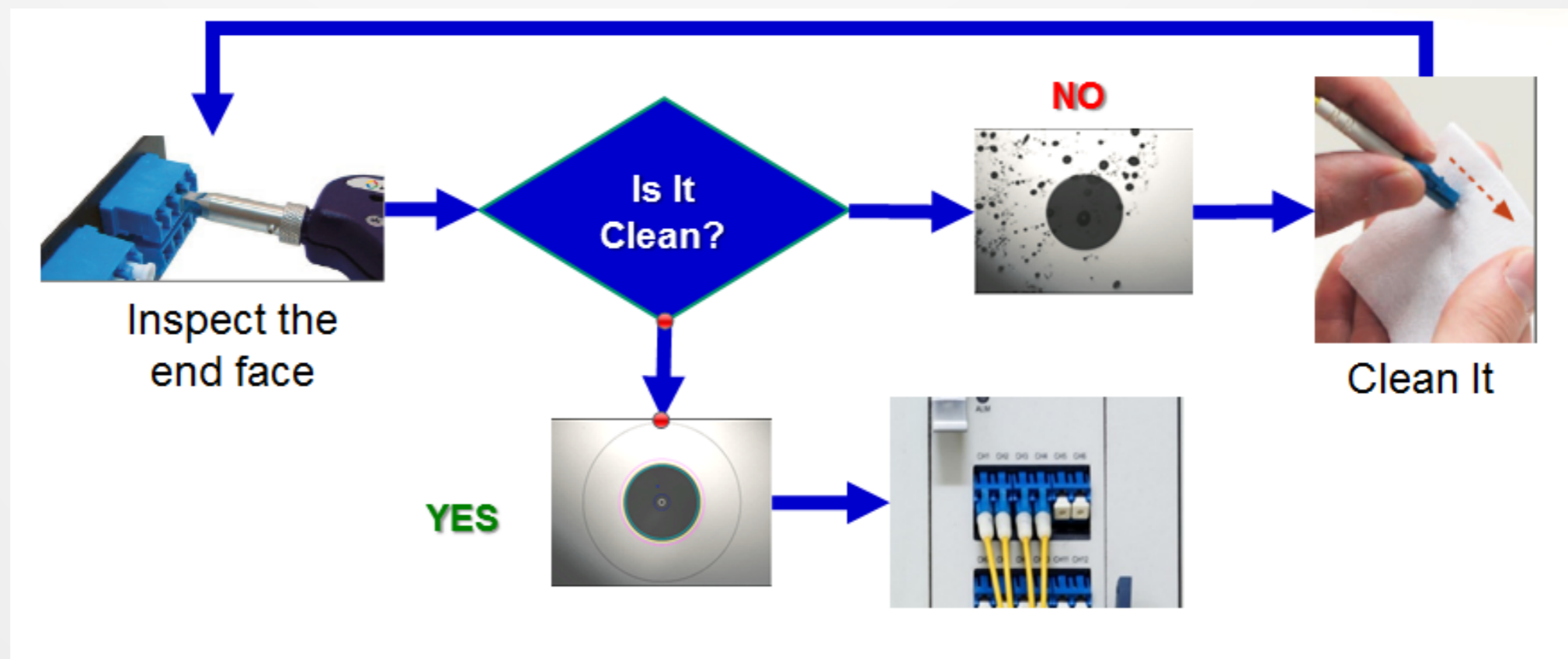
- End-face contamination is one of the most common contributors
- Should not assume a new cable assembly will have a clean end-face
- These images were captured on a new cable assembly with the cap removed





# Do It Right the First Time

- Inspect looking for permanent and removable defects
- Re-inspect the end-face after the cleaning process to verify the quality of the end-face

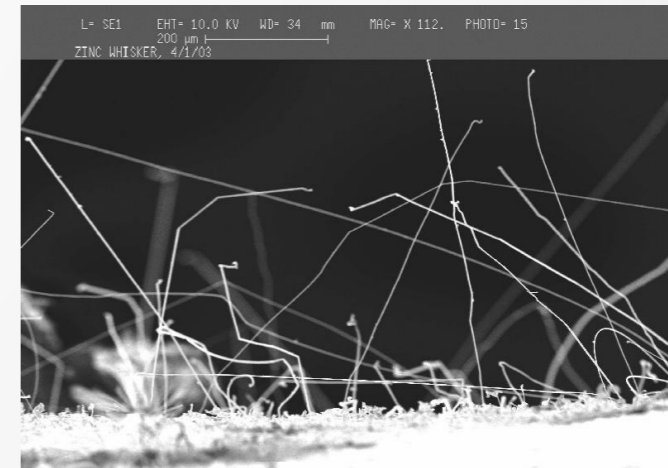




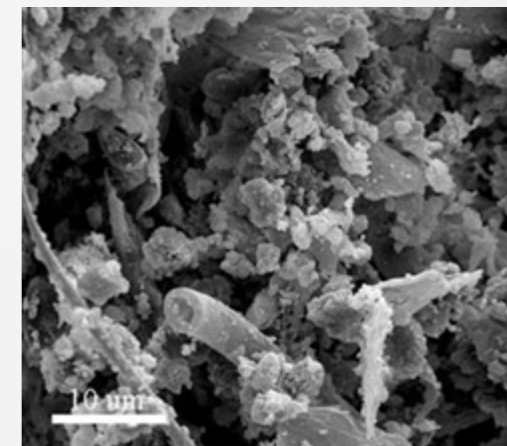
# Sources of Contamination

## Common Internal Contributors:

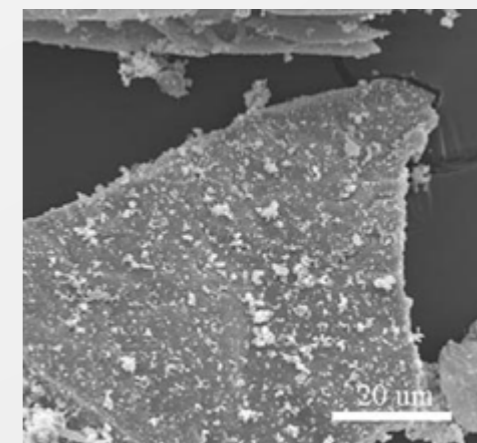
- Dead skin, hair and clothing lint
- Foam based swabs and paper based wipes
- Zinc whiskers from electroplated surfaces
- Packaging and construction materials
- Connector wear debris and dirty test assemblies
- Protective end-caps for connectors and adapters



Zinc Whiskers\*



Dust from Cabinet Top\*\*



Paper Fiber(wood) from Inside Drawer\*\*

\*Source: NASA Electronics Parts & Packaging Program

\*\*Source: Karen Brynjolf Pederson & Morten Ryhl-Svendson National Museum of Denmark

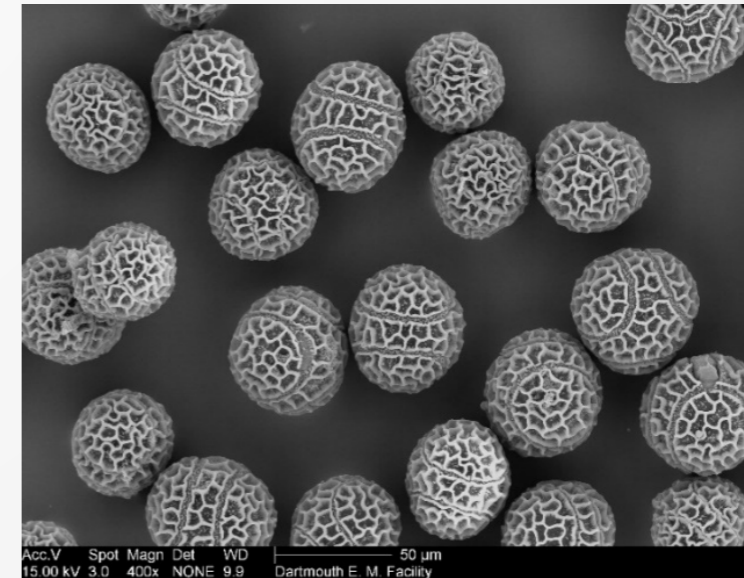




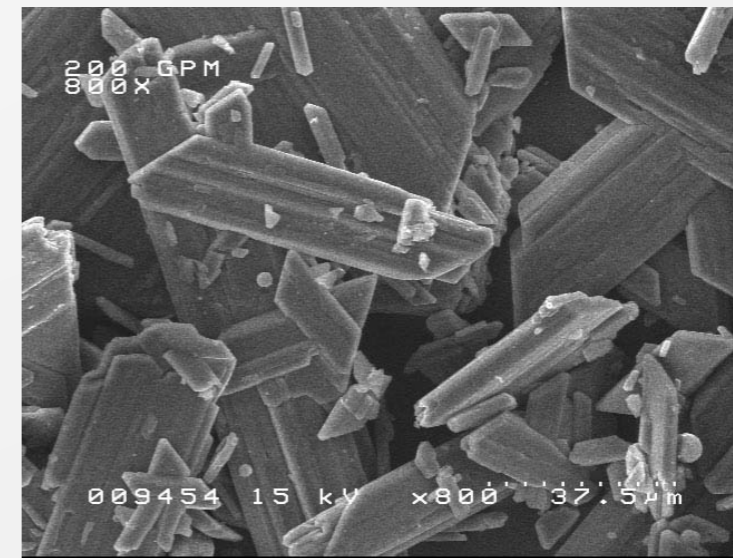
# Sources of Contamination

## Environmental Contributors:

- Electricity generation and vehicle emissions
- Plant pollen and molds
- Aerial blown dirt and sand
- Concrete dust



Flower Pollen\*



Coal Ash\*\*

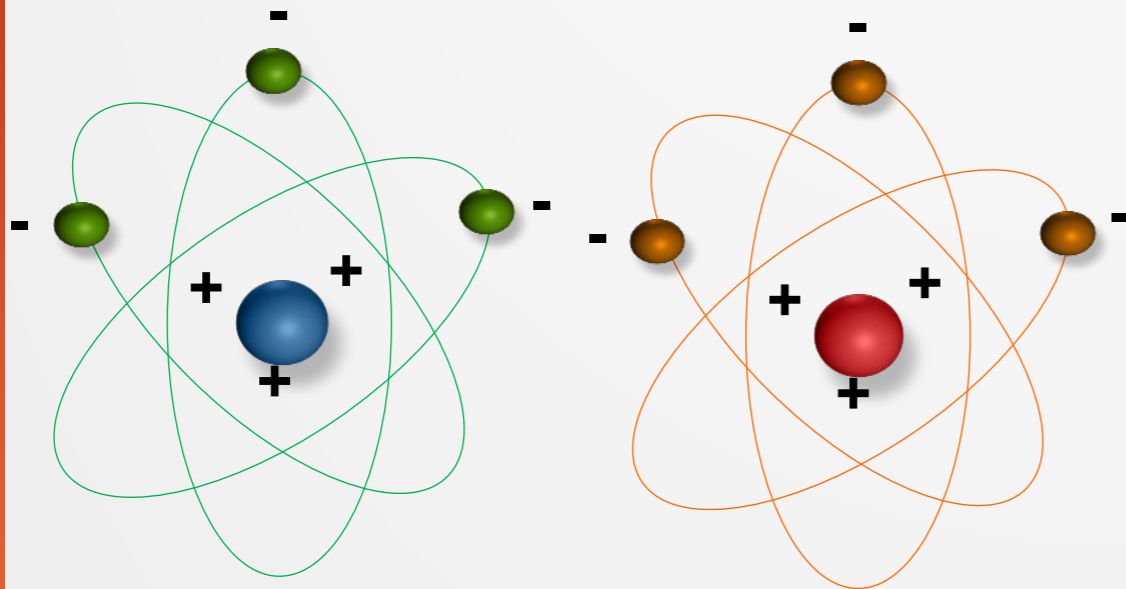
\*Source: Dartmouth College Electron Microscope Facility

\*\*Source: University of Kentucky Center for Applied Energy Research



# Sources of Contamination

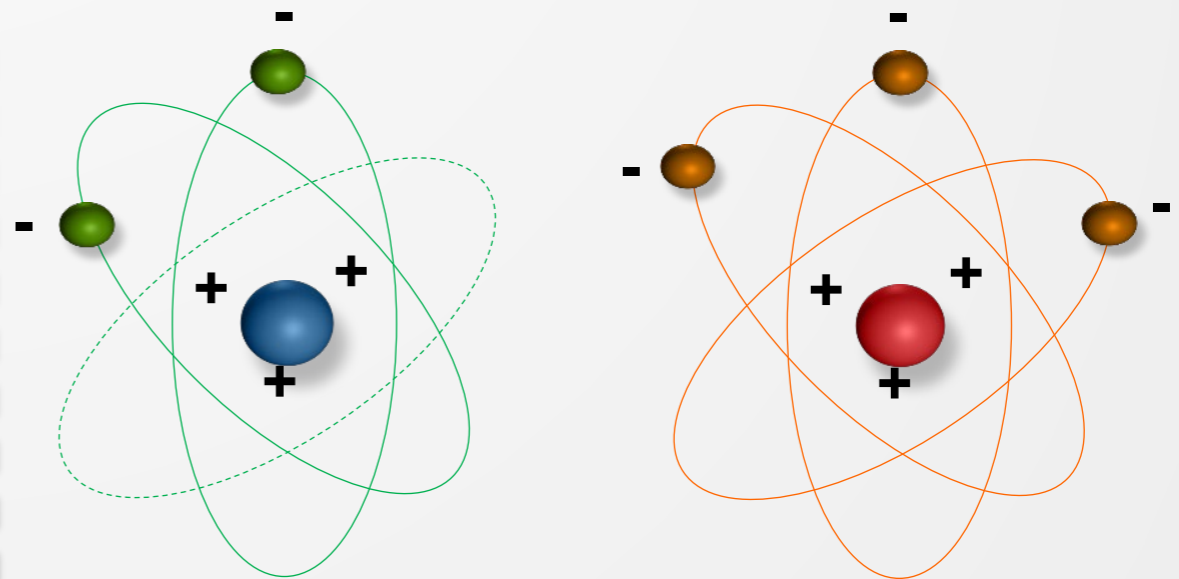
Before material contact,  
materials are not charged



Material 1	
-3	Electrons
+3	Protons
<hr/>	
0	Net

Material 2	
-3	Electrons
+3	Protons
<hr/>	
0	Net

At material separation,  
materials are oppositely charged



Material 1	
-2	Electrons
+3	Protons
<hr/>	
+1	Net

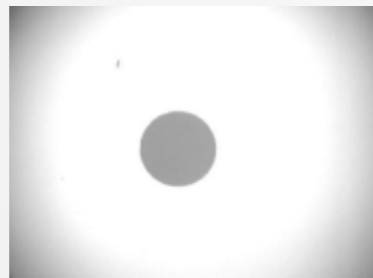
Material 2	
-4	Electrons
+3	Protons
<hr/>	
-1	Net



# Sources of Contamination

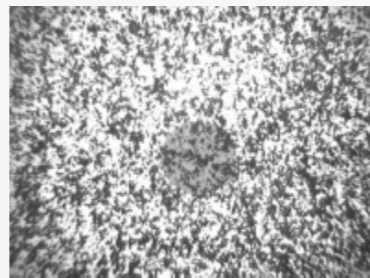
## *The Role of Electrostatic Charge Effect on Contamination of Fiber Optic Connectors and Ways of Eliminating IT*

by T. Berdinskikh, A. Fisenko, J. Daniel, J. Bragg, D. Phillips of Celestica  
*Applications of Photonics Technology 5, 420 (Feb 2003)*



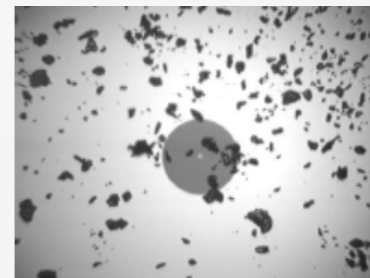
1

ST Connector is  
cleaned and  
image captured



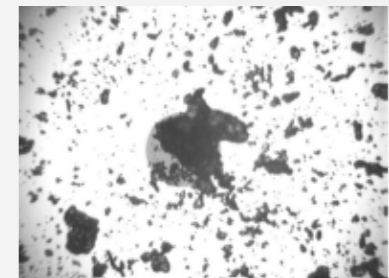
2

ST placed 2mm  
above iron dust



3

ST placed 4mm  
above iron dust



4

ST placed 2mm  
above nickel dust

### Conclusions:

- The contact friction of the dry wipe created an electrostatic charge on the ceramic ferrule surface
- The oppositely charged dust particles bonded on the ferrule surface quickly



# Mechanical Clickers

- Typically cost \$100 to \$80 for ARINC 801 & MT clickers
- Cleaners have 500 engagement

Pros	Cons
<ul style="list-style-type: none"><li>• Consistent performance</li><li>• Self aligning</li><li>• Around \$0.20 to \$0.15 per click</li><li>• Good for removing light levels of end face contamination</li><li>• Good for high volume (&gt;200 mated pairs)</li></ul>	<ul style="list-style-type: none"><li>• Limited contact region (Typical Ø1.25mm are Ø0.6mm)</li><li>• Do not clean side walls of socket termini</li><li>• Usually require multiple engagement for medium to heavy levels of contamination</li><li>• Electrostatic charging increases with multiple engagements</li></ul>





# Fluid & Stick Cleaners

- Typically cost \$0.60 to \$0.45 per stick for ARINC 801 & MT
- Usually come 50 sticks to a box

Pros	Cons
<ul style="list-style-type: none"><li>• Largest contact region for stopping particle migration</li><li>• Cleans side walls</li><li>• Creates dissipative medium for eliminating electrostatic charge</li><li>• Prefect for all levels of contamination</li><li>• Lower initial cost for lower fiber counts (&lt; 200 mated pairs)</li></ul>	<ul style="list-style-type: none"><li>• Effectiveness is dependent on operators technique</li><li>• Some cleaning fluids are not air-ship safe</li><li>• IPA attracts water molecules and vulnerable to cross contamination</li></ul>





# Wet/Dry Cleaning

## Sticks Cleaning

- Tilt can of cleaning fluid slightly
- Only moisten the stick taking care to not saturating the tip
- Single fiber Termini - Rotate 6 to 8 times in same direction termini
- MT Termini - Wipe stick in single direction go vertically

**Use Optical Grade Sticks**  
**Do NOT Oversaturate the Stick**  
**Do NOT Reuse Sticks**

## Mechanical Clickers

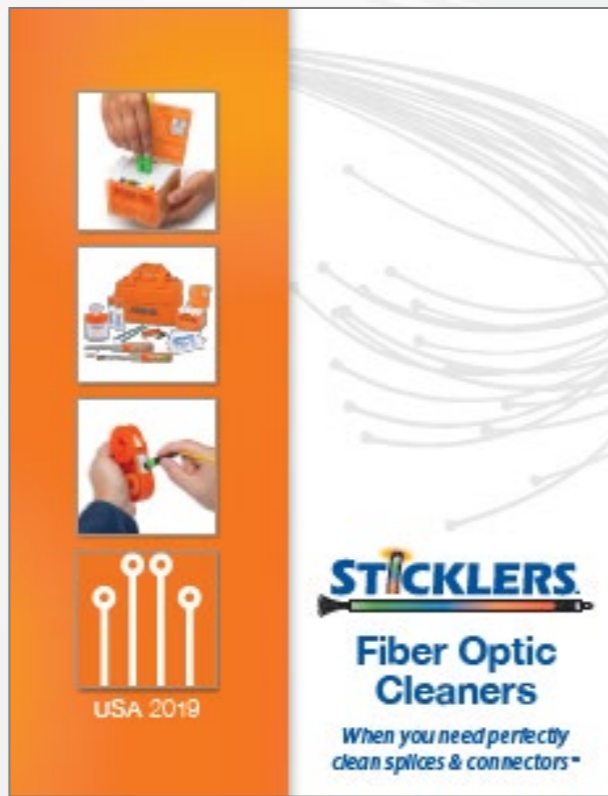
- Apply a small dab of fluid to an optical grade wipe
- Insert tip of the clicker into the moisten section of wipe
- Engage cleaner with the termini

**Do NOT apply fluid directly to the cleaning tip**





# For more information: Visit [SticklersCleaners.com](http://SticklersCleaners.com)



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