Best Practices for Maintaining & Cleaning Fiber Optic Connectors

Brian Teague | December 2018

Reasons For Not Cleaning Connectors

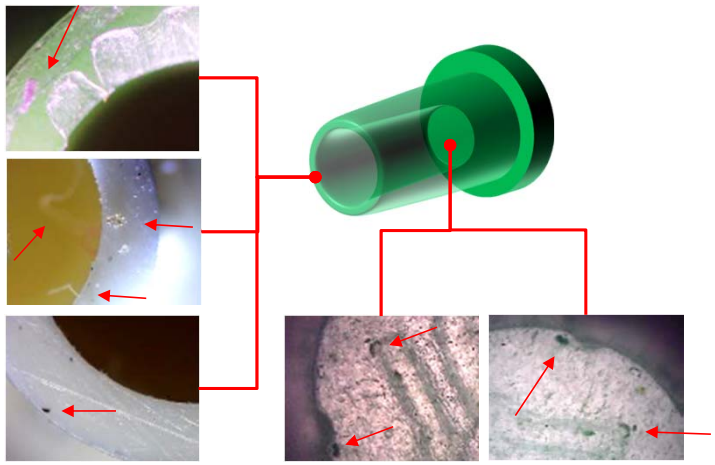
The most common reasons network installers give when asked about why the do not take the time to inspect and clean fiber connectors during an installations are:

- Why do we have to inspect & clean fiber optic connectors? I thought the suppliers do inspect & clean before the assemblies leave the factory.
- Do we really have to inspect & clean before we mate a connector pair? We can connect everything first and then go back to just fix the problems.
- Do we really have to inspect and clean every connector? I really do not have the time to that with some many connectors.

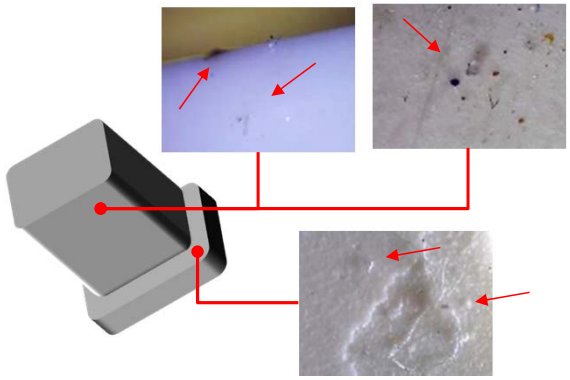
STICKLERS

Why Relying On Factor Cleaning Is Not Enough

Typical Protective End Cap
Cable Assembly



Typical Protective Plug Cap
In Adapter

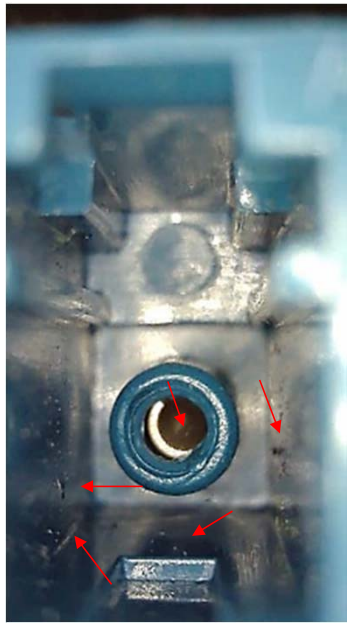


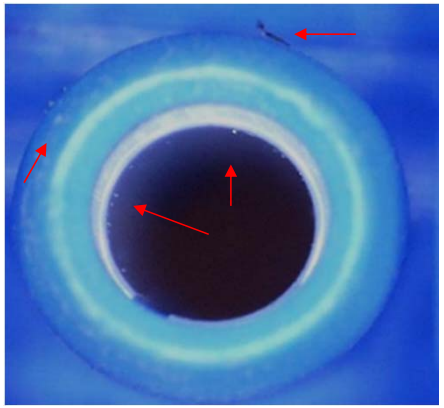
Even the best quality manufacturers who do 100% testing are vulnerable to:

- Mold release residues
- Outgassing residues
- Dust particles from contract friction

How Some Cleaning Products Cause Problems

- Dust particles are common on the inner areas of adapters
- Source of most dust usually comes from paper tissues & foam swabs which are common in cable assembly production





Dust based contamination is made worse during most factory cleaning processes when ferrule or adapter sleeve pick up a static charge

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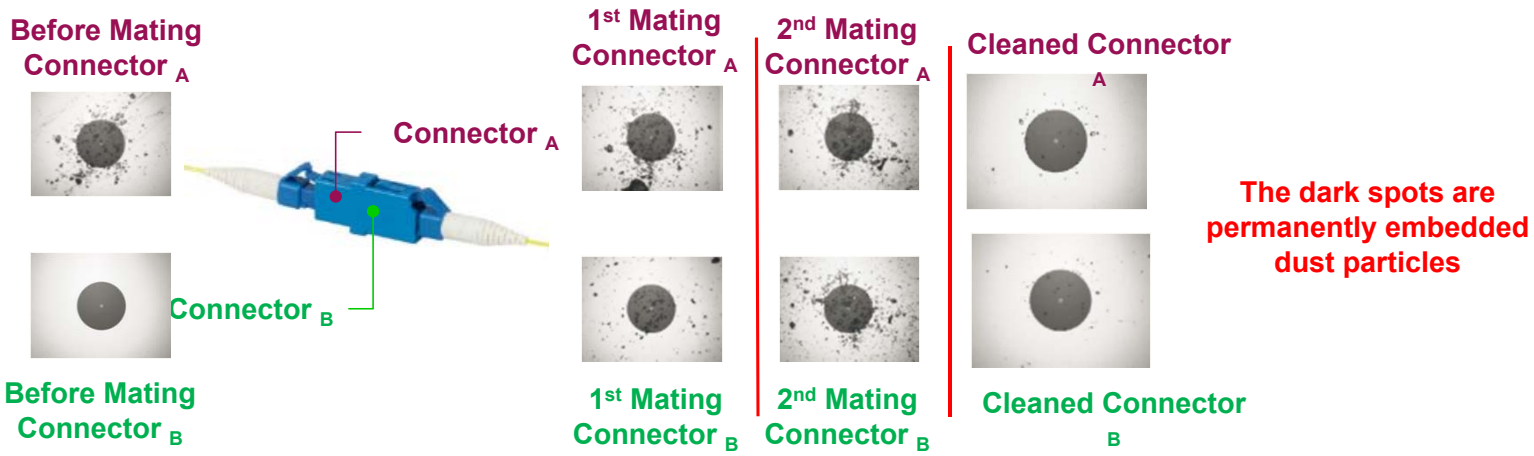
Importance Of Cleaning Both Ends Of Pair

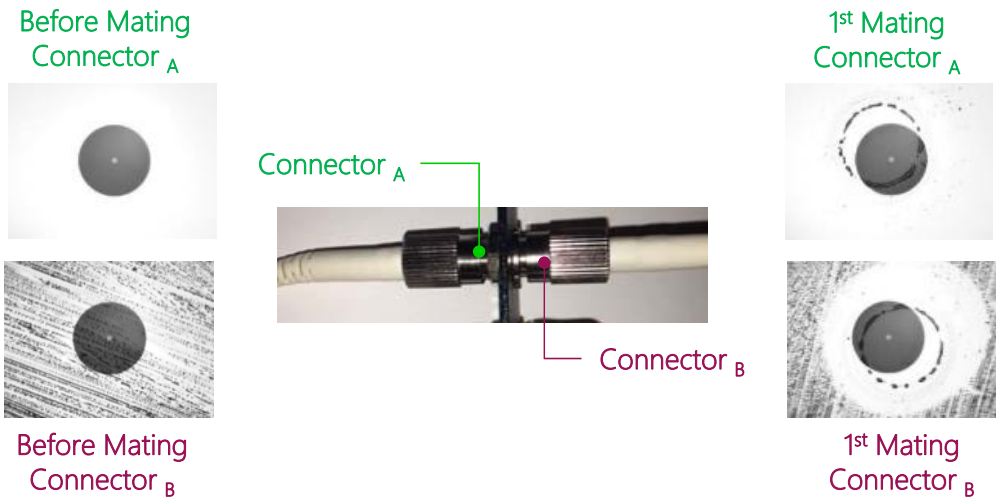
Inspecting and cleaning BOTH ENDS of a connector pair before mating:

- Eliminates cross contamination
- Prevents accidental damage to both connector end faces

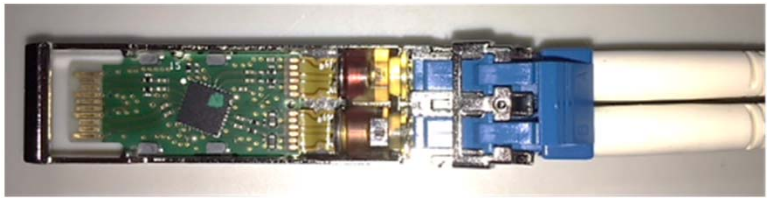


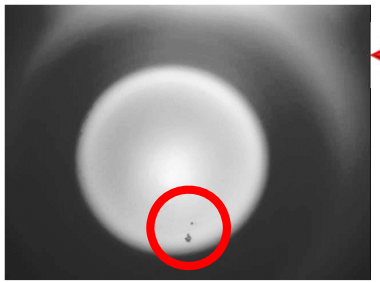
Accidental Contact During Handling

- Sometimes during the installation process, the way the connectors are handled can contribute to contamination problems
- The image below is what happens when a connector is touched to a fiber tip and mated



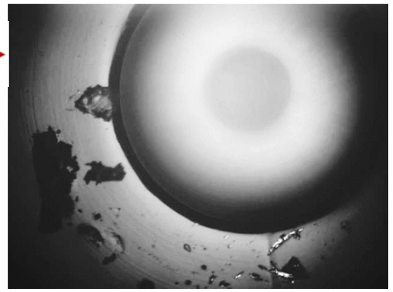
SFP+ Transceiver Inspection & Cleaning





Rear

Front

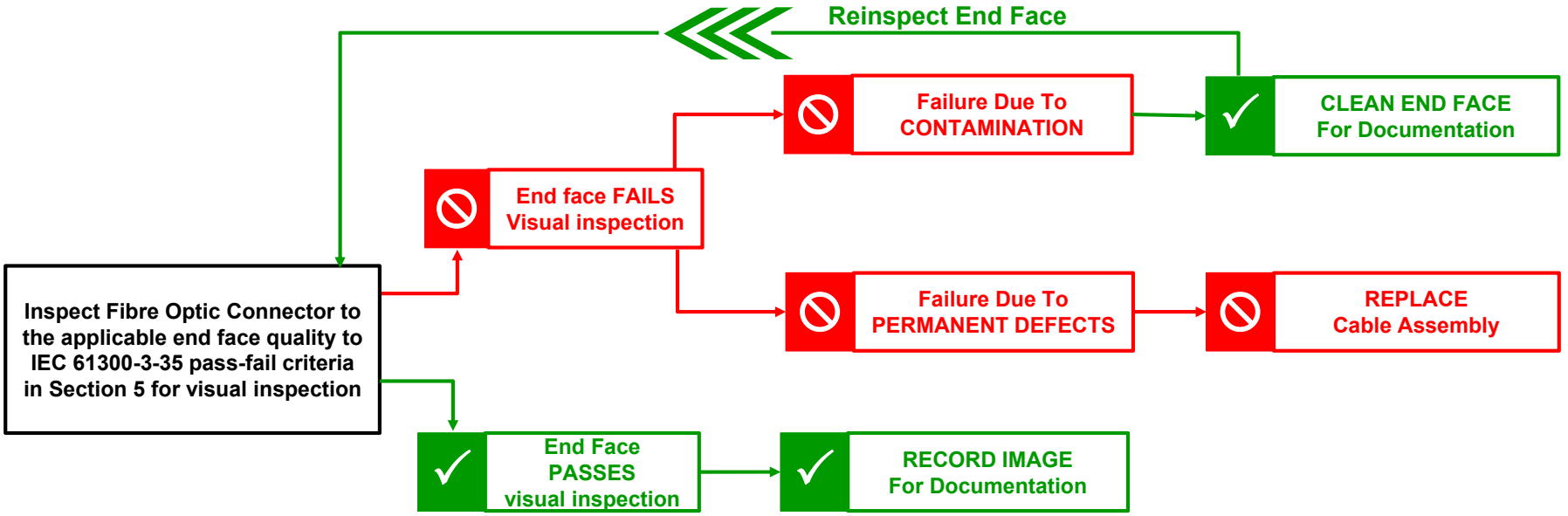


OSA PORT

Small oily droplets on lens

Metal shavings and dust possibly from the end caps on the outer edge.

Best Practice Flow Chart

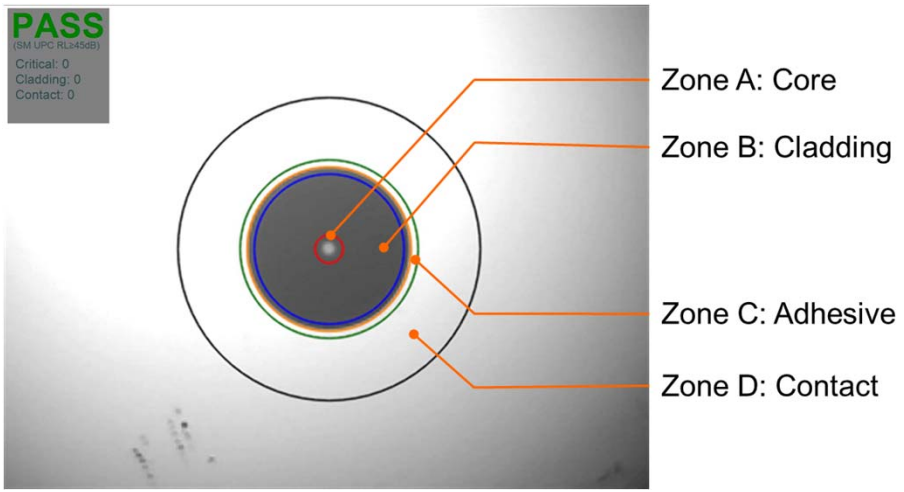


Importance of Quality Work

It takes 2 seconds for the inspection software analyzing the ferrule surface

- The inspection software eliminates human subjecting for evaluating the quality of the ferrule surface
- The software will give you a report you can give to your customer documenting the quality of your work

It takes 2 seconds to use a mechanical click cleaner to clean a ferrule end face



Expenses Caused By Damaged Cabling

Tangible Expenses:

- Truck roll back expense of sending team to identify and fix problem
- Paying operators to test and re certify the damaged fiber link
- Purchasing additional cable assemblies to replaced damaged ones

Intangible Expenses:

- Customer frustration due to delays in fixing problem
- Opportunity cost of not being able to take more projects as crew fixes problems
- Upset employees who have to spend extra time identifying and fixing the problems

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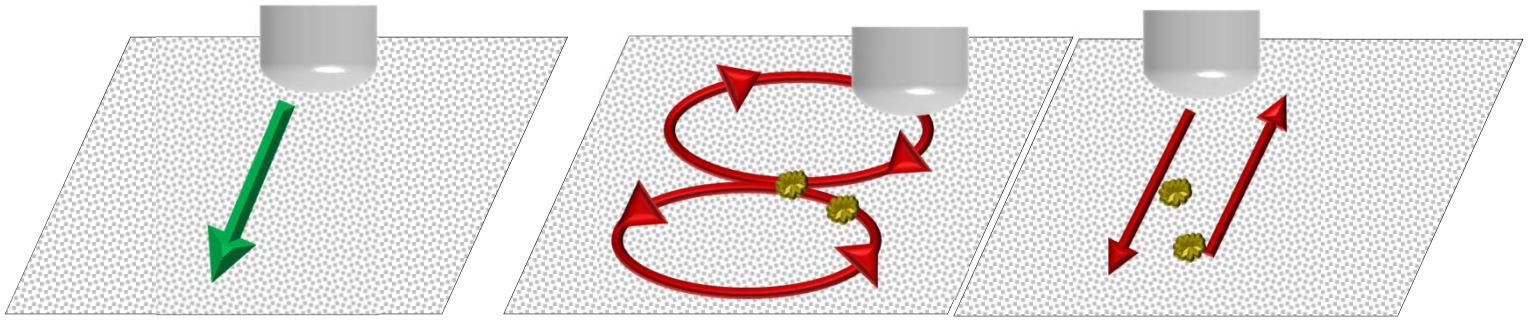
Wiping Connector End Face

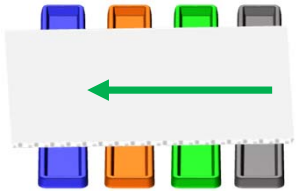
Always wipe in an optical connector going in a single direction



A figure 8 motion or a back and forth wiping motion will reapply the contamination you just wiped off back onto the connector

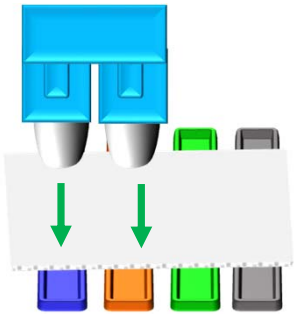
Wet-Dry Wiping Connector End Face

Step 1:
Pull a new wipe into the cleaning window



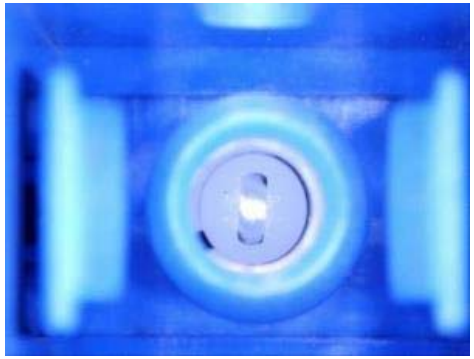
Step 2:
Wet one section of the wipe

Step 3:
Place connector in wet section and wipe towards dry

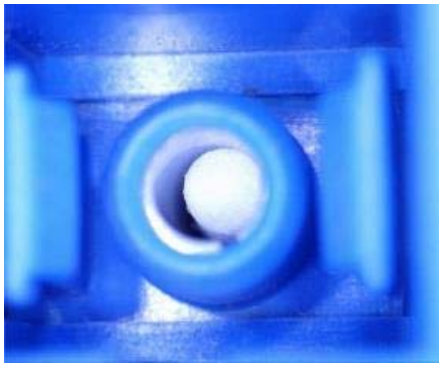


Stick vs Mechanical Cleaners

Clickers' cleaning tip inside an SC adapter



Cleaning Stick inside an SC adapter



- The cleaners are self aligning and require minimal operator technique
- Sticks clean a larger region on the ferrule surface & inner sleeve wall of an adapter

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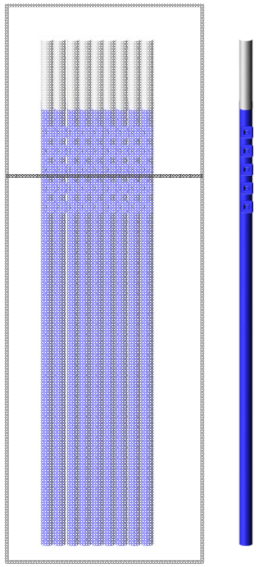
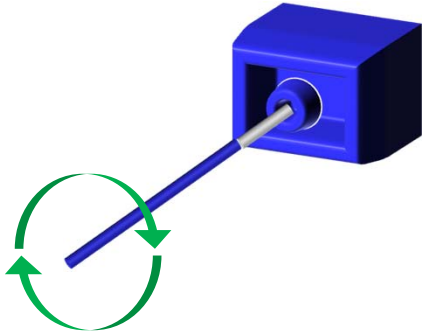
Stick vs Mechanical Cleaners

Step 1:
Take stick from package



Step 2:
Tilt can, pump & wet stick

Step 3:
Insert stick and rotate 6x to 8x in same direction



- Gentle pump will dispense enough cleaning fluid
- Taking out 1 stick at a time prevents cross contamination of remaining sticks

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Stick Cleaning For ODC/RDC/AARC Socket

APPLICABLE PRODUCTS:

- MCC P/N POC03M
  Fiber Optic Splice & Connector Cleaner cleaning fluid
- MCC P/N S12
  1.25mm CLEANSTIXX cleaning sticks

FOR BEST RESULTS:

- Moisten stick taking care not to over saturate
- Angle cleaning fluid can and gently engage pump
- Rotate stick in same direction 6X to 8X in same direction
- Use stick once to avoid accidental cross contamination

STICKLERS

Stick Cleaning For ODC/RDC/AARC Pin

APPLICABLE PRODUCTS:

- MCC P/N POC03M
  Fiber Optic Splice & Connector Cleaner cleaning fluid
- MCC P/N P25
  Pin CLEANSTIXX cleaning sticks

FOR BEST RESULTS:

- Moisten stick taking care not to over saturate
- Angle cleaning fluid can and gently engage pump
- Rotate stick in same direction 6X to 8X in same direction
- Use stick once to avoid accidental cross contamination

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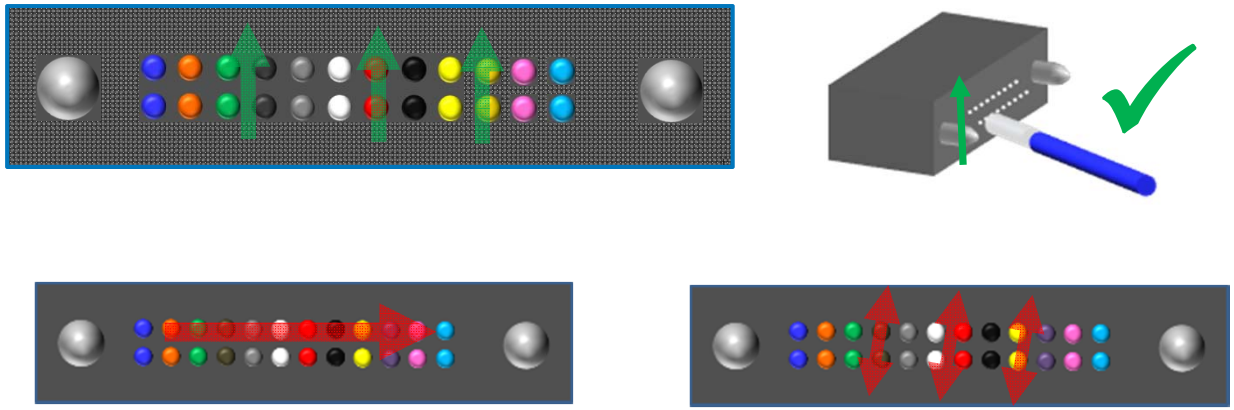
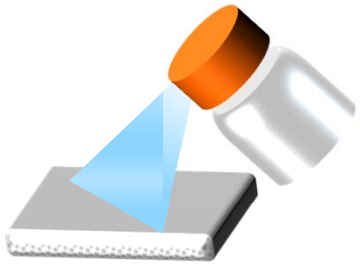
Stick Cleaning MT Based Connectors With Stick



- Move the stick in a single direction from bottom to top
- Pushing contaminations across the array or going up and down will damage the fiber arrays

Wet-Dry Cleaning With Mechanical Cleaner

Step 1:
Wet an optical grade wipe



Step 2:
Wet an optical grade wipe

Step 3:
Insert the cleaner and engage

- Avoid oversaturating the cleaning tip
- Small amount of fluids loosens up contamination plus dissipates electrostatic charge

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Wet-Dry Cleaning With Mechanical Cleaner

Best Practices for Cleaning Fluids:

- Use hermetically sealed containers to avoid cross contamination
- Less is more – Dispense just enough to clean a connector

Best Practices for Sticks & Swabs:

- Rotate stick at least 6X in a single direction
- Limit force to about the same pressure you would use for a writing pen
- Never excessively scrub the end face to prevent scratching with wear particulates

Best Practices for Wiping Connectors:

- Wipe connectors in a single direction
- Always wipe MT based connectors (i.e MPO) in a single direction vertical direction
- Tilt end face for APC so the 8˚ angle is touching the wipe

General Best Practices:

- Never look directly into a connector with the bare eye
- Inspect, clean if necessary & re-inspect
- Reusing wipes & sticks causes cross contamination

STICKLERS

Value Is In The Eye Of The Beholder

Which emerald has the greater value?

Which vehicle has the greater value?

- Companies and workers are valued in many ways like gems and vehicles
- Be the jewel that everyone wants by offering superior quality and higher performance than your competition

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