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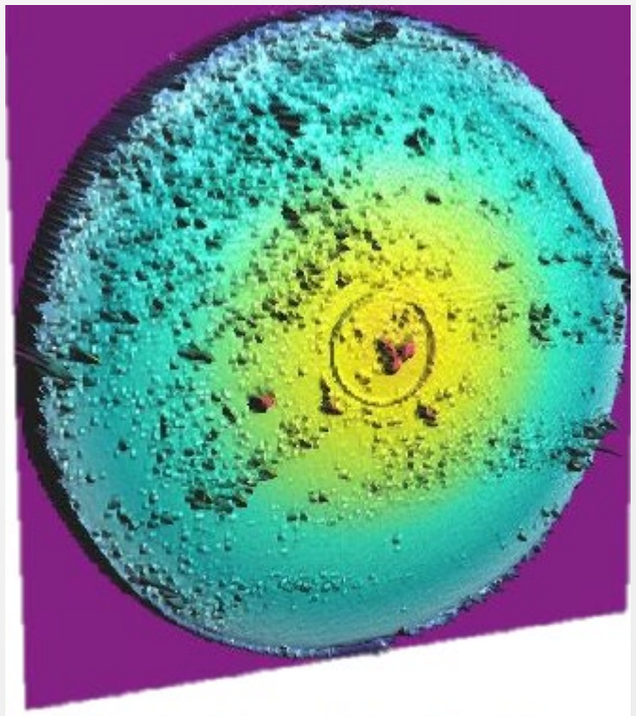
When you need perfectly clean splices & connectors™

The Effect of Static on Fiber Optic End-Faces and Connectors

Impact of Static Charge

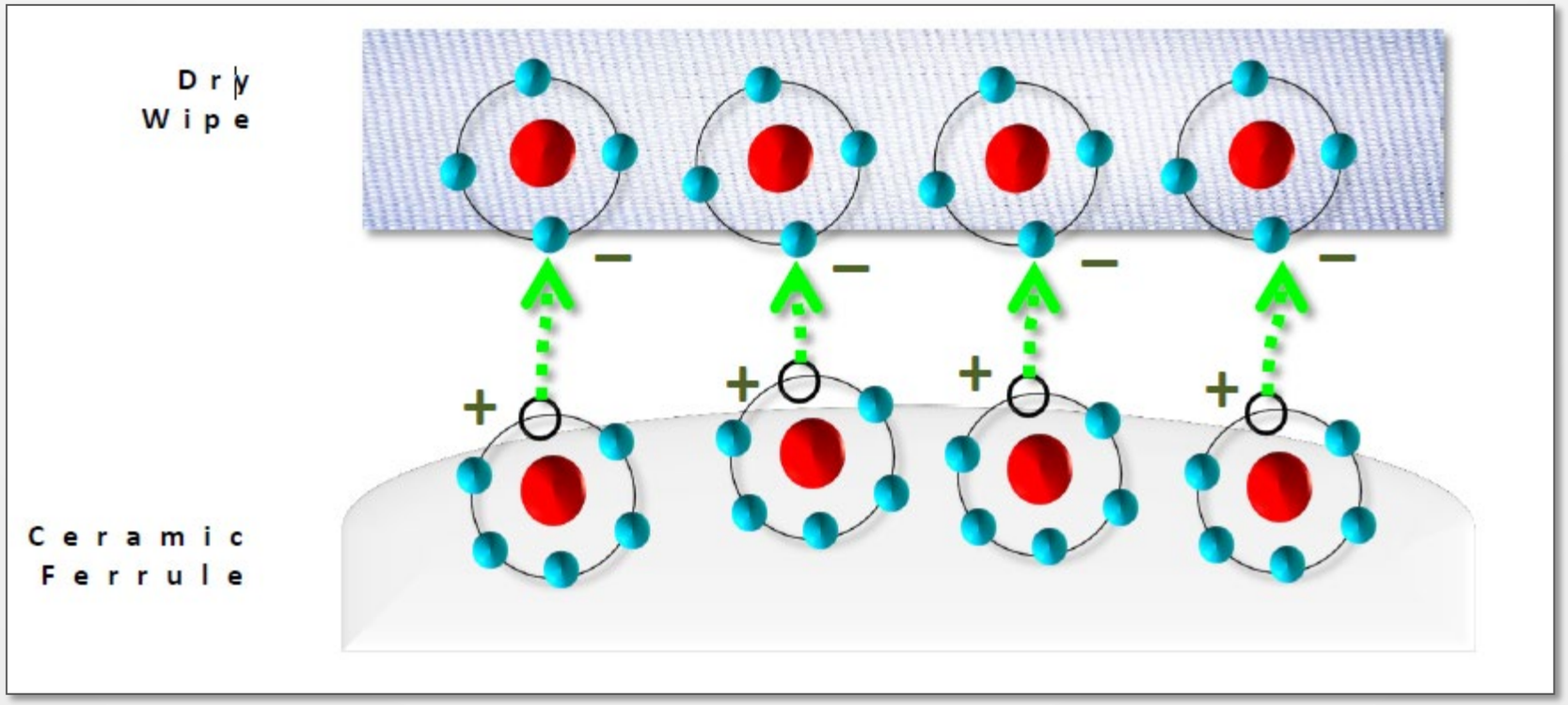
- Dust particles are all around us
- The static charge attracts and bonds with dust causing end-face contamination
- Contamination from static is expensive
  - ✓ Creates call backs and repeat cleans
  - ✓ Network down time and customer complaints
  - ✓ Causes pits and scratches on end-faces



LC End Face wit Dust Particles

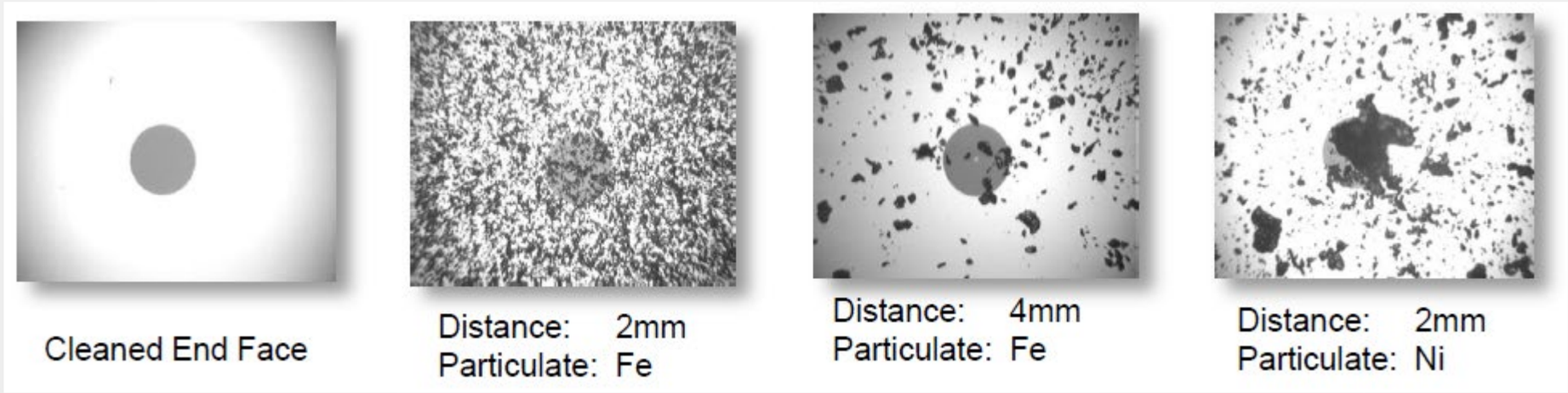
Sources of Static Charge

- Rubbing different materials together (“contact friction” causes the transfer of electrons
- The static charge on both surfaces attract and hold foreign debris
- Debris stays bonded to surfaces until the static charge is dissipated



Sources of Static Charge

- Wear debris and contact friction
  - Connector mating process
  - Insertion of inspection scopes and test gear
- Aerial dust particles and contact friction
  - Dry wiping a connector end-face
  - Equipment cooling fans
  - Fans in the HVAC system
- Connectors and adapters charged by contact friction during cleaning
  - Most anti-static plastics require atmospheric moisture to be effective
  - Dry wiping a ferrule end-face (trioboelectric effect)



Images from *The Role of Electrostatic Charge Effect on the Contamination of Fiber Optics Connectors and the Way of Elimination It*
Tatiana Berdinskikh, Anatoliy, Joe Daniel, Jason Bragg, Daniel Phillips

Wet Dry Clean Connectors

- Cleaning fluid increases the local humidity level allowing static to dissipate

- Avoid hygroscopic fluids and containers that draw in air to avoid cross contamination

- Pre-saturated wipes are vulnerable to contamination from packing materials

- Use fast-evaporating and high-purity cleaning fluids with optical-grade wipes

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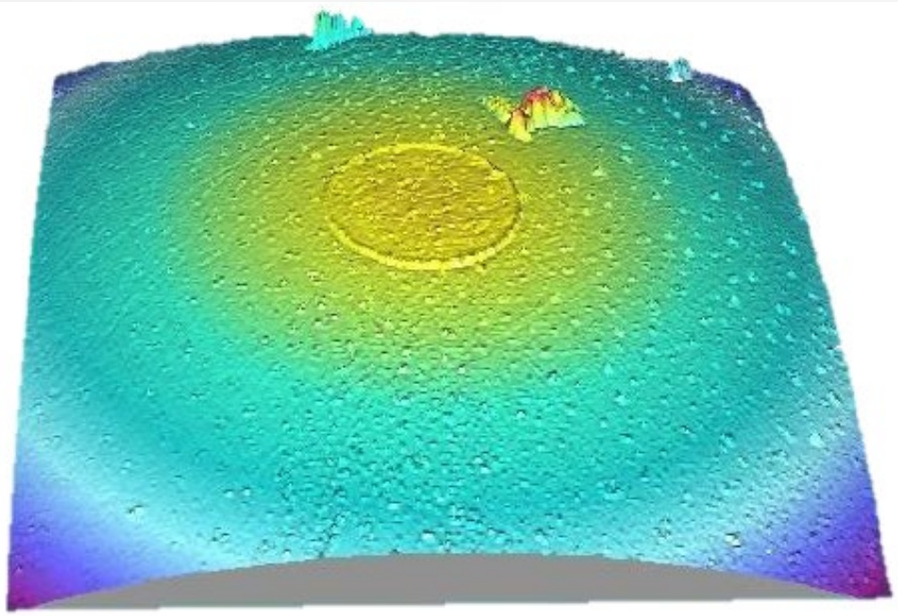
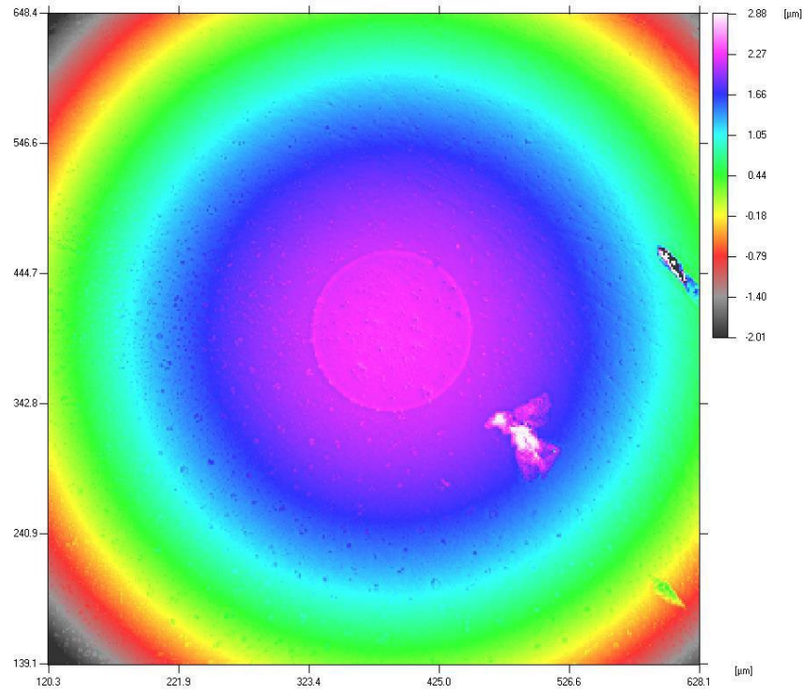
IPA Issues

- IPA is a hygroscopic meaning it attracts water molecules
- Alcohol dispersers pull in the air during the pump action
- Very flammable with high vapor pressure



LC End Face with IPA Residue



Cleaning Fluid Selection Guide

1. What kind of contamination have connectors been exposed to?	2. What are conditions like at the work site?
▪ Residues/dust particles/both ▪ Light or severe contamination level ▪ Material degradation	▪ Ventilation/air flow ▪ Flammability concerns ▪ Operating & storage conditions ▪ Air quality ▪ Atmospheric dust & moisture levels
3. How do the solvents need to be transported ?	**4. What are regulatory requirements?**
▪ Need for air shipment ▪ Hazmat restrictions ▪ No-spill/no-leak containers	▪ DOT, restrictions ▪ RoHS, GHS & REACH compliance ▪ Substance & chemical restrictions

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Technique Recommendations

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

Thank you!

www.SticklersCleaners.com