

Inspecting & Cleaning Fiber Optic Connections

Clean fiber optic components are a requirement for quality connections between fiber optic equipment. One of the most basic and important procedures for the maintenance of fiber optic systems is to clean the fiber optic equipment.

The goal is to eliminate any dust or contamination and to provide a clean environment for the fiber-optic connection. Inspection, cleaning and re-inspection are critical steps for the connector as well as the bulkhead before you make any fiber-optic connection.

A 1-micrometer dust particle on a single-mode core can block up to 1% of the light (a 0.05dB loss).

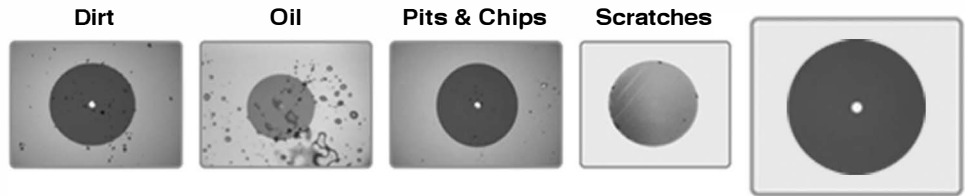
A 9-micrometer speck is still too small to see without a microscope, but it can completely block the fiber core. These contaminants can be more difficult to remove than dust particles.

By comparison, a typical human hair is 50 to 75 micrometers in diameter, as much as eight times larger.

In addition to dust, other types of contamination must also be cleaned off the endface. Such materials include oils from human hands, film residues (condensed from vapors in the air) and powdery coatings left after water or other solvents evaporate away.

The IEC 61300-3-35 Standard - "Fiber Optic Connector Endface Visual and Automated Inspection".

Recently published as an interoperability standard for connector manufacturers and users. Zones are used to prioritize evaluation criteria. Different failure criteria for defects and scratches are specified for each zone.



Recommended Inspection & Cleaning Tools

- Portable hand-held video microscope for inspecting connector endfaces.
- Mechanical dry cleaner to sweep and lift away dust and residues from endface.
- Wet cleaning and degreasing agent and lint-free wiping material.



Lightel Fiber Optic Video Microscope

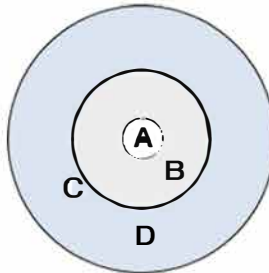


IBC One-Click Dry Fiber Cleaner



Chemtronics Electro-Wash QbE Wipes

Zone	IEC 61300-3-35 Recommended Acceptance Criteria Multimode Polished Connectors	
	Scratches	Defects
Core	No limit $\leq 3 \mu\text{m}$ None $> 3 \mu\text{m}$	$4 \leq 5 \mu\text{m}$ None $> 5 \mu\text{m}$
Cladding	No limit $\leq 5 \mu\text{m}$ None $> 5 \mu\text{m}$	No limit $< 2 \mu\text{m}$ 5 from $2 \mu\text{m}$ to $5 \mu\text{m}$
Adhesive	No limit	No limit
Contact	No limit	None $\geq 10 \mu\text{m}$



Zone A: Core Zone
Zone B: Cladding Zone
Zone C: Adhesive Zone
Zone D: Contact Zone

There are 3 major ZONES (A/B/D) on the end face that are used to define the level of impact contamination may have on signal performance. Particles closer to Zone A (Core) will have more impact than those farther out.

Regular Inspection & Cleaning reduces network downtime and offers optimized signal performance and prevention of network damage.

General Inspection & Cleaning Process

⚠ Always be sure laser sources are turned off before you begin the inspection and cleaning process.

1. Inspect the fiber connector, component, or bulkhead with a fiberscope. If the connector is found to be dirty, clean it with a dry cleaning technique.
2. Inspect the connector. If the connector is still dirty, repeat the dry cleaning technique.
3. Inspect the connector. If the connector is still dirty, clean it with a wet cleaning technique followed immediately with a dry clean in order to ensure no residue is left on the endface.
4. Inspect the connector. If clean, it is ready to use. If connector is still dirty repeat wet cleaning process and inspect again.