OOO "Техэнком" Контрольно-измерительные приборы и оборудование www.tehencom.com Fiber Inspection Technical Poster

'AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE'

Properly inspecting a fiber-optic cable can prevent a slew of problems, saving you time, money and pains

Multifiber Connectors

• Multifiber connectors can be used in many applications including FTTH, data centers, ROADMs, etc.

• Common types include the MPO, MTP®* and OptiTip®*



Single-Fiber Connectors

SC Simplex

singlemode

nultimode

SC Duplex

singlemode

FC Simplex

singlemode

(singlemode/

E2000 Simple

(singlemode/

nultimode

E2000 Duplex

LX-5 Simplex singlemode

FIP-400 adapter tips UP

100

FIPT-400-FC-SC

Pa

and the second

FIPT-400-E200

FIPT-400-OTAP-MTP-AI

Male

* MTP is a registered trademark of US Conec and OptiTip is a registered trademark of Corning Cable Systems

Inspecting multifiber connectors requires a special inspection tool. A scanning wheel is used to inspect each fiber individually. MT ferrules may house 4, 8 and 12 fibers or more.







Solutions

Microscope

connectors

Only inspects male

• Risk of eye exposure

to laser radiations





Fiber Inspection

connectors

Probe and Display

· Inspects male and female



Fiber Inspection Probe on FTB Platform • Uses the platform screen; no need for additional display

• Very secure, no direct eye • Stores images for future exposure to laser radiations reference

Patch panel inspectio

 Performs automated image analysis

Where to inspect/clean

 Not always secure enough to inspect live fibers

- The following items should always be on your inspection/cleaning list:
- Patch panel (e.g., splitter cabinet)
- Test jumpers
- Cable connector

When to clean

The very first step is connector inspection. This applies to all testing phases-construction, activation and maintenance. Connectors should be cleaned only if the inspection reveals that they are dirty.

How to inspect

- 1. Connect the probe to the connector and select the corresponding IEC standard.
- 2. Adjust magnification to 400x.
- 3. Start the analysis using the Capture button.
- 4. View the results.
- 5. Clean or replace the connector depending
- on the result.





nultimode FIPT-400-LX.5 LC Simplex (singlemode/ (h) multimode) (a) P--MU Simplex (singlemode/ nultimode) (in MU Duplex FIPT-400-MU singlemode/ Multifiber Connectors IP-400 adapter tips APC FIP-400 adapter tips UP Male Female Male MT-RJ (2 fiber: -(4, 8, 12 fibers) **FTTA Connectors** FIP-400 adapter tips UP Male 20 Outdoor connector (ODC) 2 fibers (singlemode/multimode) FIPT-400-ODC 2PIN-P-K 3 60 FIPT-400-ODC-S Outdoor connector (ODC) 4 fibers (singlemode/multimode) FTTH Connectors FIP-400 adapter tips U OptiTap[®] (drop terminal with single fiber ports) 1 fiber (singlemode/multimode) FIPT-400-U25MA (drop terminal with multifiber expans Up to 12 fibers (singlemode) and FIPT-400- APC and FIPT-40 DTAP-MTP-APC OTAP-MTP-APC OptiTip[®] Up to 12 fibers (singlemode/multimode)

Connectors

P-400 adapter tips APC

alles .

CB

-



Connector Issues

Dust/dirt residue

• If not cleaned properly, residues will transfer and can lead to permanent damage when mating.



Wet residue

• Most often caused by an incorrect cleaning technique-fibers must be carefully dried after a wet cleaning.

Oily residue

- Most often caused by touching with fingers technician must never touch fiber ends.
- An oily residue may act as a matching gel:
- May not affect IL and RL short term May trap dust and increase IL and RL over time

Circular residue

- Most often caused by an incorrect cleaning technique
- Occurs when fiber is mated while still wet
- Typically happens in the contact area
- Contamination will migrate from male to female fiber ends

Adhesive region defects

- May occur during the manufacturing process or from mishandling
- Epoxy residue and chips may occur in
- this region • Normal if size does not exceed standards

Dirty/damaged connector

- Most often results from poor handling or cleaning
- Defects appear small, but may still fail inspection criteria

Scratches

- May appear as light or dark defects
- May be hard to see with the naked eye
- Critical when in the core area of SM fibers











Connector Inspection Criteria

Connector certification on the fly



Standards-based criteria

IEC 61300-3-35



measurement procedures n·//webstore.iec.ch/ • IPC 8497-1

Cleaning methods and contamination assessment for optical assembly http://www.ipc.org/

A connector endface has multiple zones

- Dimensions will depend on the connector and fiber type • Multimode and singlemode connectors have different sizes
- Zone tolerances will differ



ConnectorMax analytical software

- Guarantees a uniform level of acceptance Between users within an organization
- Between suppliers and customers Between contractors and network owners
- Facilitates the decision-making process by removing subjectivity



Advanced Fiber Inspection Test Kit

TK-1-FIP-400

Housed in the powerful FTB-1 Platform, this test set combines a fiber inspection probe and a large 7-inch display with an integrated optical power meter and visual fault locator. Also available are the ConnectorMax automated connector endface analysis software and a complete













Thanks to the powerful processing capabilities of EXFO's FTB test platforms, technicians can perform IEC and IPC pass/fail analysis with ConnectorMax, the fastest field-analysis tool on the market. In just a few seconds, a full connector certification test results and a test report are generated. All this at the touch

Fiber-optic interconnecting devices and passive components-basic test and

shifted fiber, RL ≥45 dB

Cleaning Connectors

Suggested inspection/cleaning procedure

"If the fiber fails inspection for defects, the user shall clean the fiber and repeat the inspection process"

Always clean twice before rejecting a connector



Dry cleaning

Dry cleaning using a mechanical cleaner is recommended the first step. If, after two dry cleaning attempts, soil is still present on the connector, proceed to a hybrid cleaning.



(male/female)

Multifiber mechanical cleaner (MTP/MPO) (male/female)



Patch-cord mechanical cleane (female only)

How to dry clean

Insert the jumper and push the outer shell to begin cleaning. A click sound will indicate that the cleaning is complete.

Some mechanical cleaners are compatible with male and female jumpers as well as with MPO and other connectors.



How to clean a single fiber connector with a dry-cleaning method Scan and watch the video (http:www...)



Hybrid cleaning

Hybrid cleaning is a mix of the wet and dry cleaning methods and involves using a solvent. The first step is to clean the connector endface with a solvent and then dry any remaining residue with either a wipe or a swab.

If, after using the hybrid cleaning method, the connector still fails to meet the acceptance criteria, you may then consider replacing the connector.



to clean optical connectors

ELECTRO-WASH





How to clean using the hybrid method

1. Wet a corner of the wipe with solvent 2. In a smooth linear motion, trace the endface of the jumper twice over the wet area

3. In a smooth linear motion, trace the endface of the jumper three times over the dry area





How to clean a single fiber connector with a hybrid cleaning method Scan and watch the video (http://www...)





Our fiber inspection solutions are also offered in kits that include the essential cleaning tools. Ask your local EXFO representative for details





Assessing **Next-Gen Networks**