

# Advanced Testing Services



Flexible and professional field-test services that deploy time-saving standards and procedures

EXFO's Advanced Test Services offer project testing beyond the normal scope of requirements. Whether it's a suite of tests combined to characterize a fiber pair, a high-end test that can isolate costly PMD, or a network-wide test audit that can document fiber routes, all follow a set of standards and procedures that save time and money.



Service Assurance

## FIBER CHARACTERIZATION

Through extensive field experience and engineering analysis, EXFO has concluded that a defined standard suite of tests (below) can satisfy all fiber characterization requirements for testing 10, 40 or 100 gigabit optical/physical networks.

### EXFO Fiber Characterization Test Suite

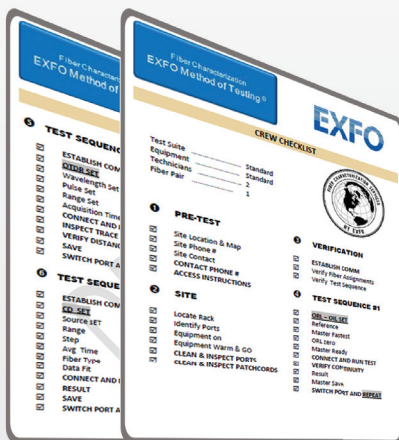
TEST	DESCRIPTION	ACRONYM	DIRECTION	WAVELENGTHS (n)
Optical Time-Domain Reflectometer	Measures and verifies distance, loss, event location	OTDR	↔	1550, 1625 nm
Optical Insertion Loss	Measures and verifies end-to-end loss	OIL	↔	1550, 1625 nm
Optical Return Loss	Measures and verifies reflective loss	ORL	↔	1550 nm
Polarization Mode Dispersion	Measures and verifies dispersion caused by birefringence	PMD	→	C band
Chromatic Dispersion	Measures and verifies wavelength dispersion	CD	→	1530 to 1620 nm

The test suite plus additional standards of testing and reporting (shown below) are designed to be a comprehensive examination of the critical restrictions of bandwidth, and are used as a de facto standard to qualify a pair of optical fibers on a span-by-span basis.



### EXFO Fiber Characterization Test Kit

A standard crew kit that equips both technicians is displayed at right. The kit includes two test platforms, plus test modules and the necessary handheld equipment, including inspection tools.



### EXFO Fiber Characterization MOP

Only one **method of procedure** is followed, very similar to a flight checklist that airline pilots use. This improves communication between technician no. 1 and technician no. 2, which saves time.

FIBER CHARACTERIZATION REPORT																				
Site A	Length (km)	Fiber ID	Power Meter dB										PMD	CD	Loss	Site B	Span			
			1550 nm	1550 nm	1550 nm	1550 nm	1550 nm	1550 nm	1550 nm	1550 nm	1550 nm	1550 nm						1550 nm		
8366 Hwy 90	5.62	23	-1.84	-1.50	-1.87	-1.07	-1.80	-1.88	-1.88	-1.88	-1.88	-1.88	-1.88	-1.88	-1.88	-1.88	-1.88	-1.88	-1.88	-1.88
	5.62	24	-1.48	-1.56	-1.52	-1.46	-1.46	-1.46	-1.46	-1.46	-1.46	-1.46	-1.46	-1.46	-1.46	-1.46	-1.46	-1.46	-1.46	-1.46
8366 Hwy 90	14.57	11	-3.54	-3.53	-3.59	-3.02	-3.58	-3.61	-3.11	-3.14	-3.18	-3.18	-3.18	-3.18	-3.18	-3.18	-3.18	-3.18	-3.18	-3.18
	14.57	12	-3.75	-3.02	-3.01	-3.01	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00
8366 Hwy 90	9.58	20	-2.21	-2.07	-2.04	-2.02	-2.02	-2.04	-2.04	-2.04	-2.04	-2.04	-2.04	-2.04	-2.04	-2.04	-2.04	-2.04	-2.04	-2.04
	9.58	30	-2.37	-2.40	-2.39	-2.45	-2.51	-2.41	-2.51	-2.51	-2.51	-2.51	-2.51	-2.51	-2.51	-2.51	-2.51	-2.51	-2.51	-2.51
12066 Century	11.06	13	-2.53	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56
	11.06	14	-2.45	-2.51	-2.44	-2.51	-2.56	-2.46	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56	-2.56
12066 Century	9.61	20	-1.54	-1.51	-1.50	-1.72	-1.78	-1.74	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77
	9.61	24	-1.15	-1.16	-1.16	-1.19	-1.13	-1.16	-1.16	-1.16	-1.16	-1.16	-1.16	-1.16	-1.16	-1.16	-1.16	-1.16	-1.16	-1.16
10913 Clondine	11.67	19	-2.75	-2.82	-2.79	-3.17	-3.12	-3.15	-3.09	-3.14	-3.14	-3.14	-3.14	-3.14	-3.14	-3.14	-3.14	-3.14	-3.14	-3.14
	11.67	20	-3.31	-3.35	-3.33	-3.35	-3.74	-3.78	-3.80	-3.73	-3.80	-3.80	-3.80	-3.80	-3.80	-3.80	-3.80	-3.80	-3.80	-3.80

### EXFO Fiber Characterization Report

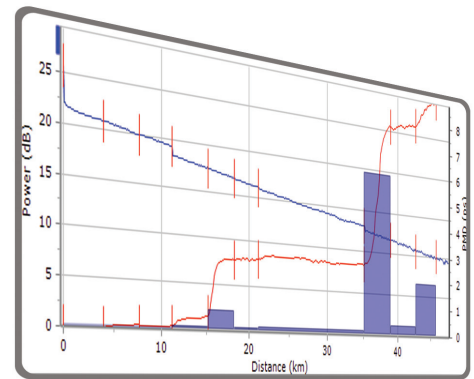
A comprehensive template is used as the standard for reporting. The report condenses all the necessary data into a one-page, per-span summary that can easily be interpreted by equipment engineers and managers.

All raw data can be saved to CD for proof of testing and permanent records. When customer requirements stipulate a customized report, the data can be formatted to meet the demand.

### PMD MITIGATION

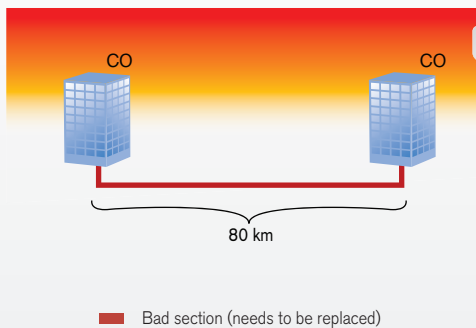
EXFO recognizes the problems inherent in upgrading networks to higher bandwidth transmission rates. One of the key parameters that often prevent further bandwidth increases is PMD. It simply isn't enough to know a link's PMD. It is also necessary to know how PMD is distributed along the length of a fiber link. Knowing this allows network operators the luxury of replacing very small sections of fiber rather than entire links. EXFO's DPMD (distributed PMD) Analyzer will:

- › Locate fiber sections that are large contributors to the total PMD of a link
- › Enable the isolation and repair of only the worst PMD sections of the fiber cable
- › Allow the cost-effective upgrade of a fiber network otherwise limited in speed by PMD
- › Help identify small changes that can boost the entire network's performance

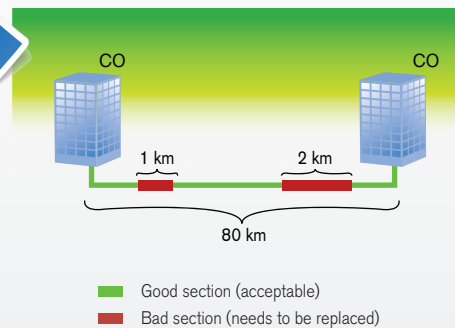


It isn't enough to only know that a link has high PMD. Now you can find the smaller segment(s) that caused it—making cost-effective PMD mitigation possible for the first time in the history of fiber-optic transmission.

We can help you turn this...

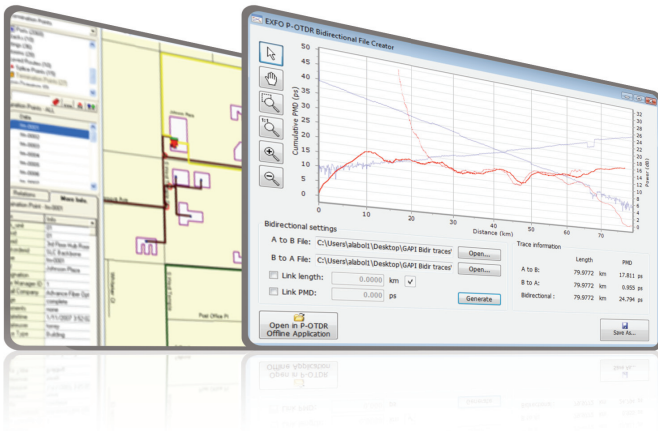


...into this



Distributed PMD analysis reduces CAPEX by revealing the worst segments on a high-PMD route. Replacing a few kilometers of fiber instead of an entire route puts it back in service for higher bit-rate services and substantially reduces CAPEX.

EXFO's Distributed PMD Service provides the data needed to allow network operators to make intelligent decisions about PMD mitigation, as well as minimize OPEX associated with lengthy troubleshooting methodologies.



## NETWORK AUDIT

Network Audit Services by EXFO provide independent verification of outside-plant fiber cables and spans by conducting the following tests and procedures:

- › OTDR and power tests for continuity, fiber identification and length
- › Comparison to “as-builts” or current network maps
- › Identification of any out-of-spec fibers in the network

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