

NON-INTRUSIVE TESTING ON HIGH BEND RADIUS FIBER

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PRODUCT NOTE

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Fiber-to-the-home (FTTH) requires larger angles of bending and more compact fiber-management systems. This has forced the fiber industry to develop new fiber technology that allows fibers to remain efficient in environments where extreme bending occurs. These fibers, commonly referred to as low-loss high bend radius fibers¹, protect the network by limiting high losses that can result from fiber pinching or bending, therefore, making twisting, pulling and all physical manipulation of the fiber less damageable.

These fibers are great for installation, but for maintenance and upgrades, a number of issues can emerge. One of the favored tools in central offices and cabinets is the live fiber detector, which uses a macro-bending technique to eject light, thus enabling live fiber identification or dark fiber management with modulated tones (e.g., 1 kHz or 2 kHz tones). Since these fibers are bend-resistant, the angle of bending provided by traditional live fiber detectors does not create sufficient loss for proper fiber identification.

EXFO has recently introduced a novel approach for non-intrusive clip-on fiber monitoring (refer to <http://documents.exfo.com/appnotes/tnote028-ang.pdf>). This approach monitors the loss as a function of the bending angle and stops the bending when the signal is sufficient for a decent and reliable detection, which means that the angle of bending is not fixed; it is dependent on wavelength and fiber. This approach allows us to address the needs of low insertion-loss requirements of today's high-speed, multi-wavelength or FTTH systems.

EXFO's new LFD-250/LFD-300 Live Fiber Detectors provide the functionalities required to detect and identify the direction of propagation of an in-fiber signal to a sensitivity level of approximately -30 dBm at 1550 nm. Furthermore, when attempting to locate a particular dark fiber by using a modulation tone, the performance of the LFD-250 and LFD-300 is excellent on high bend radius fibers. Since the coupling ratio of these fibers is far different than that of traditional fibers, the displayed power measurement on the LFD-250 is unreliable².

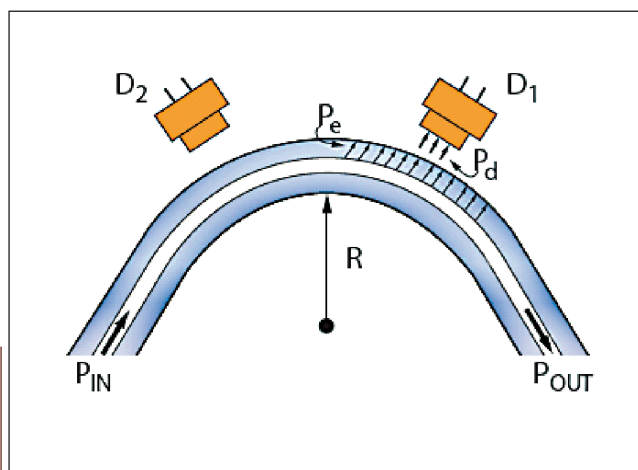
These are the only units that perform the following:

- Live fiber detection
- Traffic direction detection
- Tone (270 Hz, 1 kHz and 2 kHz) detection
- Dark fiber identification

EXFO's LFD-250 and LFD-300 are able to perform the above tasks, which are impossible to perform with the traditional fixed-angle bending approach.

¹Examples of such fibers are Draka BendBright, Sterlite Bend-Lite, Sumitomo PureFiber and OFS FLEXFiber.

²Only the Draka BendBright was tested, but other fibers should behave similarly.



The angle of bending adapts to the fiber type, enabling the LFD-250/LFD-300 to work on high bend radius fibers.



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