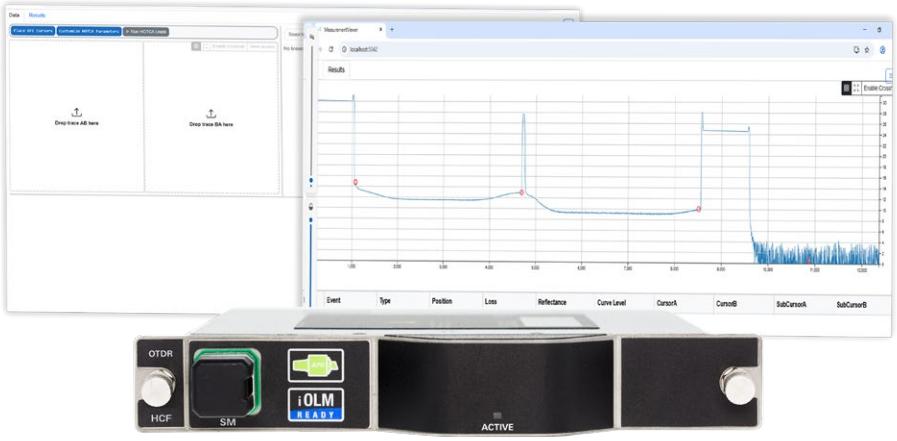
SPEC SHEET

NS-348X – Hollow-Core Fiber OTDR Test Kit

LONG-DISTANCE FIBER CHARACTERIZATION AND FIBER UPGRADES

- High dynamic range combined with high resolution for hollow-core fiber characterization.



KEY FEATURES

- Hollow-core fiber unidirectional and bidirectional post-processing software
- Hollow-core fiber range up to 150 km (assuming 0.1 dB/km fiber)
- Supports multiple fiber types (HCF and SMF), each with its own index of refraction (IOR), on a single OTDR trace
- Hybrid cable testing (HCF and SMF) with automated parameter adjustment
- Dynamic range up to 46 dB (based on SMF measurement)

APPLICATIONS

- Hollow-core fiber characterization, maintenance and troubleshooting
- Ultra-low latency data transmission for financial trading networks and data center interconnects
- High-capacity transmission for long-haul and high-speed signals

RELATED PRODUCTS

Fiber inspection scope
FIP-400B (Wi-Fi or USB)

Fiber inspection scope
FIP-500

Single-ended CD/PMD analyzer
FTBx-570

Optical spectrum analyzer
FTBx-5255

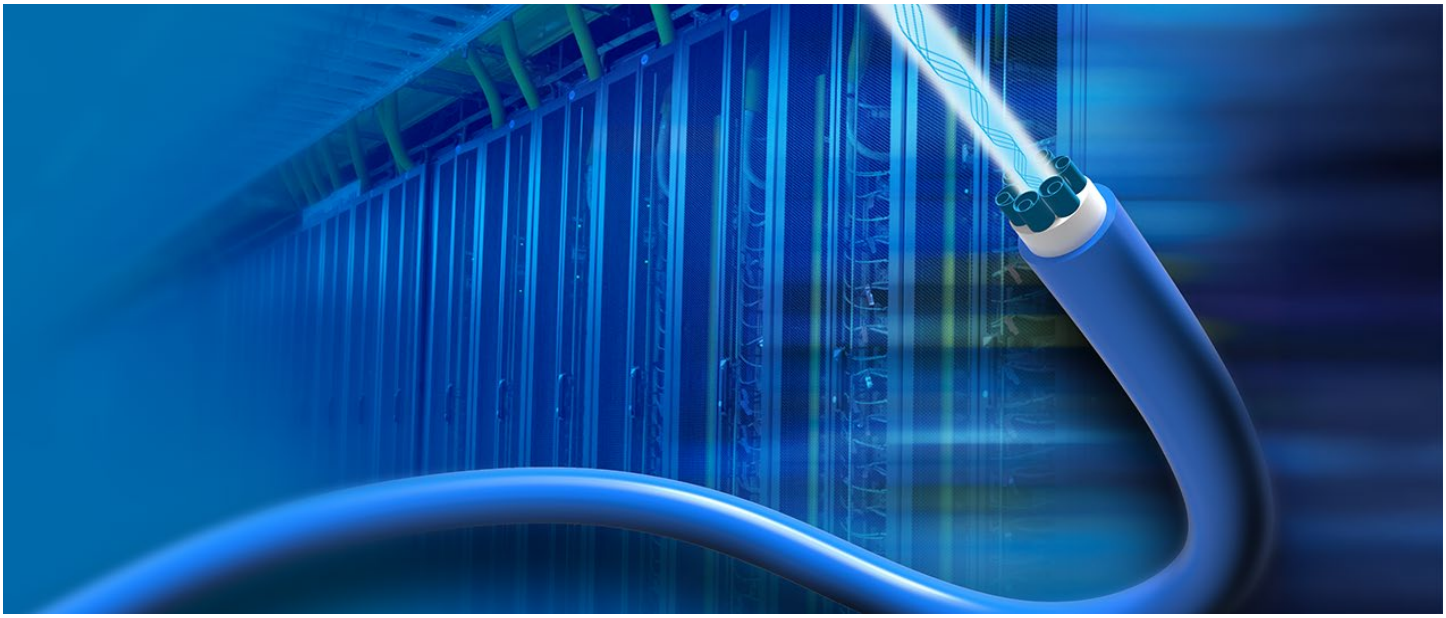
Optical loss test set
MaxTester 945

1G-800G test solution
FTBx-88810 Series

Passive optical component testing platform
CTP10

HOLLOW-CORE FIBER: THE NEXT BIG LEAP IN OPTICAL CONNECTIVITY

Hollow core fiber (HCF) represents a major advancement in optical transmission technology. Unlike conventional solid-glass fiber, HCF guides light through an air-filled core surrounded by a microstructured cladding. With the latest nested antiresonant nodeless fiber (NANF) design, the attenuation limitations of earlier photonic bandgap fibers have been overcome. NANF preserves the inherent latency advantage of hollow-core technology, as light travels through a medium with a refractive index near 1.0 compared to 1.5 for standard ultra-low-loss SMF-28 single-mode fiber. Recent trials in both lab and field settings have demonstrated record-low attenuation below 0.1 dB/km—surpassing SMF-28, which typically exhibits ~0.16 dB/km in ultra-low-loss variants. Researchers anticipate further improvements toward 0.05 dB/km, making it a strong choice for long-haul deployments. Additional benefits include minimal nonlinear effects, supporting higher optical launch powers and extended transmission distances.



Adoption of hollow core fiber is accelerating in applications where ultra-low latency and high data rates are defining factors, such as data center interconnects (DCI), high-performance computing clusters, and advanced telecommunications networks. In DCI scenarios—where vast amounts of information must be exchanged between facilities—HCF delivers a competitive advantage by reducing propagation delay while also lowering the need for power-hungry amplification over extended distances. Beyond interconnects, promising use cases include precision timing distribution, low-latency financial trading, and next-generation sensing systems, all of which demand both speed and stability.

EXFO SOLUTION ADDRESSES OTDR CHALLENGES IN HCF TESTING

EXFO's Hollow-Core Fiber OTDR Test Kit includes a high-power OTDR combined with dedicated external PC analysis software enabling users to:

Dynamically adjust the IOR for hybrid cables	Decouple the gas signal around the fiber optic signal splice (separating the gas filling event signal caused by external air rushing in the HCF splices from the hollow core fiber RBS signal)	Measure actual splice loss and reflectivity	Identify problems related to the HCF-SMF transition splice	Evaluate overall cable loss and ORL	Evaluate HCF section loss and attenuation

Discover how our expertise and purpose-built solution addresses the unique testing challenges of hollow-core fiber.

SPECIFICATIONS

All specifications valid at 23 °C ± 2 °C with an FC/APC connector, unless otherwise specified.

TECHNICAL SPECIFICATIONS – HOLLOW CORE FIBER (NANF)	
Dynamic range	1310/1550 model = 30 dB 1310/1550/1625 model = 29 dB
Calculated distance range (km) [c]	>150

TECHNICAL SPECIFICATIONS – SINGLE-MODE FIBER	
Wavelengths (nm) [a]	1310 ± 20/1550 ± 20/1625 ± 15
SMF dynamic range	1310/1550 model = 46 dB 1310/1550/1625 model = 45 dB
Event dead zone (m)[d]	0.5
Attenuation dead zone (m) [e]	2.5
Distance range (km)	0.1 to 400
Pulse width (ns)	3 to 20 000
Linearity (dB/dB) [a]	±0.03
Loss threshold (dB)	0.01
Loss resolution (dB)	0.001
Sampling resolution (m)	0.04 to 10
Sampling points	Up to 256 000
Distance uncertainty (m) [f]	±(0.75 + 0.0025 % × distance + sampling resolution)
Measurement time	User-defined (maximum: 60 minutes)
Typical real-time refresh (Hz)	4
Stable source output power (dBm)[g]	1.5
Reflectance (dB) [a]	±2

GENERAL SPECIFICATIONS		
Size (H × W × D)		158 mm × 24 mm × 174 mm (6 ¼ in × ¹⁵⁄₁₆ in × 6 ⅞ in)
Weight		0.4 kg (0.9 lb)
Temperature	Operating Storage	Refer to platform's specification sheet –40 °C to 70 °C (–40 °F to 158 °F)
Relative humidity		0% to 95% non-condensing
Warranty (year)		1

LASER SAFETY

a. Typical.
b. Typical dynamic range with a three-minute averaging at SNR = 1.
c. Assuming 0.1 dB/km fiber and 3 min averaging.
d. Typical for reflectance from –35 dB to –55 dB, at 3-ns pulse.
e. Typical at 1310 nm, for reflectance at –55 dB. Attenuation dead zone is 3.5 m typical at 1310 nm with reflectance below –45 dB.
f. Does not include uncertainty due to fiber index.
g. Typical output power value at 1550 nm.

ORDERING INFORMATION

NS-348X

Optical configuration
0 = HCF OTDR module, 1310/1550 nm, HCF analysis software (for PC)
1 = HCF OTDR module, 1310/1550/1625 nm, HCF analysis software (for PC)

Example: NS-3480

a. Please refer to the **iOLM specification sheet** for the complete and most recent description of these value packs.

EI CONNECTORS

To maximize the performance of your OTDR, EXFO recommends using APC connectors on singlemode port. These connectors generate lower reflectance, which is a critical parameter that affects performance, particularly in dead zones. APC connectors provide better performance than UPC connectors, thereby improving testing efficiency.

For best results, APC connectors are mandatory with the iOLM application.

Note: UPC connectors are also available. Simply replace EA-XX by EI-XX in the ordering part number. Additional connector available: EI-EUI-90 (UPC/ST).

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EXFO serves over 2000 customers in more than 100 countries. To find your local office contact details, please go to **www.EXFO.com/contact**.

  Printed in Canada 25/10