VIAVI Solutions

# Switching Gears

## Testing High-Speed Data Centre Infrastructure in the AI Era

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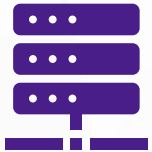
A **VIAVI Solutions** presentation

# What is driving the need for a new outlook?



AI connected Data Centres increasing, **higher capacity required**

**400G / 800G deployments** now accelerating

Combination of validating old and new **dark fibre - Fibre Characterisation**

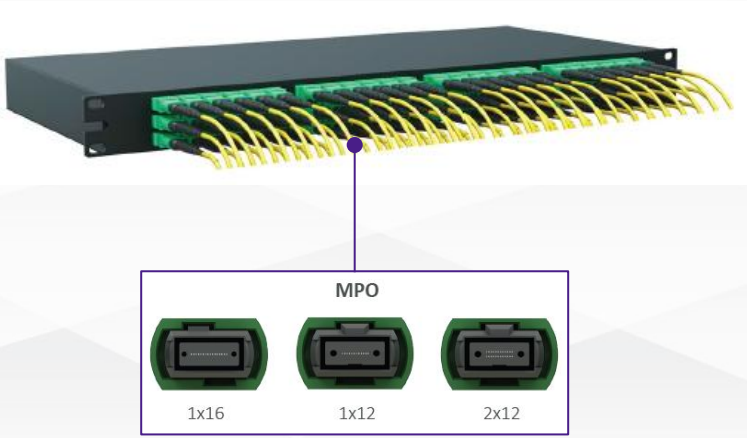
**Lighting up of telco providers** moving into DC spaces

**And Now we have something new (sort of) - Hollow Core Fibre…..**

# Fiber Density Growth for AI Data Centres

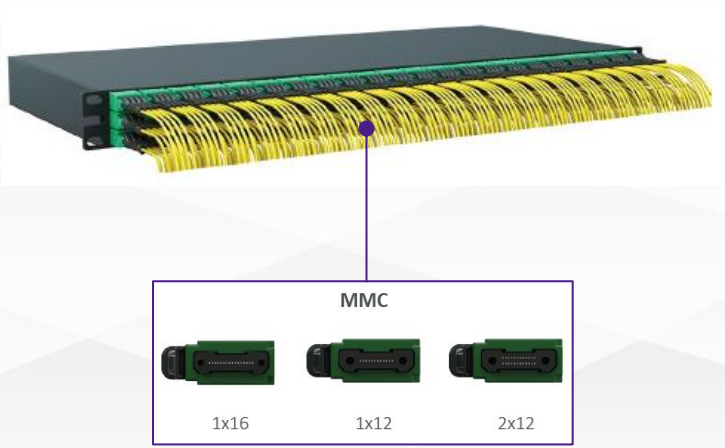
**864**

in 1RU using
**MPO12** connectors




**6,336**

in 1RU using
**MMC24** connectors



# First – We need to Inspect

## Introducing the INX-752/-754 and INX-762/-764

- Quick-swappable batteries to minimize interruptions to inspection operations

| Model | 4 test/min |
|---|---|
| INX-760 | 2.0hr |
| INX-762 | 3.5hr |
| INX-764 | 8.0hr |

- Battery charger accessory for charging a spare battery outside the microscope

- Extended life battery model for 8 hours of use between charges

- USB-C and barrel jack ports for charging the battery internally

# Second – We need to Test, Quickly!

## TIER 1 MULTIFIBER TESTING **REDEFINED**.

Introducing the **DCX 700** Multifiber Optical Loss Test Set

# ONE CORD. 24 FIBERS. ZERO DOUBT.

## FAST

Certifies up to 24 fibers in just 2 seconds - industry-leading speed.

## UNIVERSAL

Swappable adapters — test any Multifiber connectivity with one mainframe (MPO-12, MMC-16/24).


## SIMPLE

One-cord referencing — no y-cables, no extra steps, no confusion.

## SMART

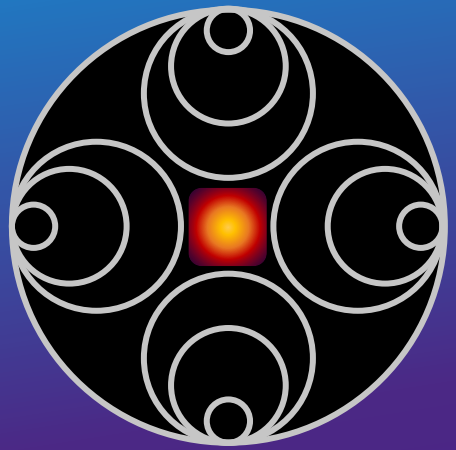
Full automation suite – VIAVI TPA and smart wizards guide every step.

# Data Centre Interconnect

## Hollow Core Fibre

### – An Introduction

What is it and how do you test it?



# Drivers for New Technology Adoption

## Short and Long-term Opportunities

### AI & High-Performance Computing

AI model training, synchronization, and real-time inference

### Quantum Communication

Maintains light coherence for quantum key distribution and ultra-secure networks

### Remote Data Centers

Allows DCs to be located 60–90 km away from urban centers, reducing costs, energy use, and environmental impact

### Defence and Secure Communications

Air-guided structure makes HCF resistant to tapping

### Smart Cities, Edge Computing and 5G/6G Infrastructure

Enables fast, highly reliable and responsive network for IoT, autonomous systems, and real-time data processing close to the edge

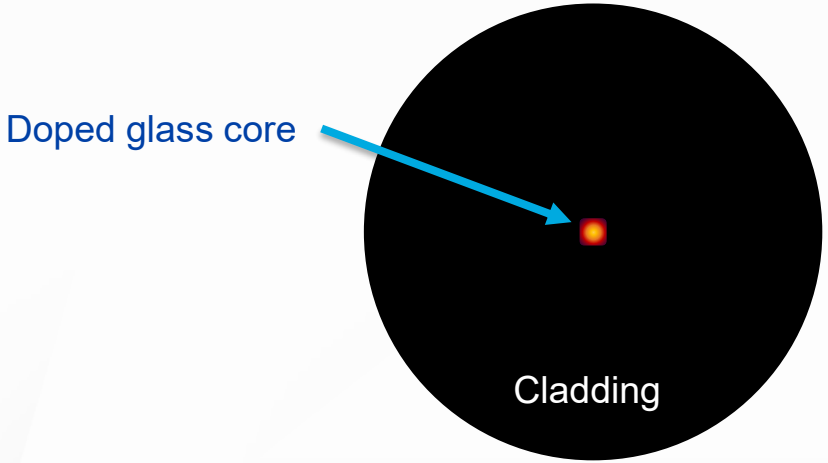
### Financial Services

Ideal for high-frequency trading and low-latency transaction networks

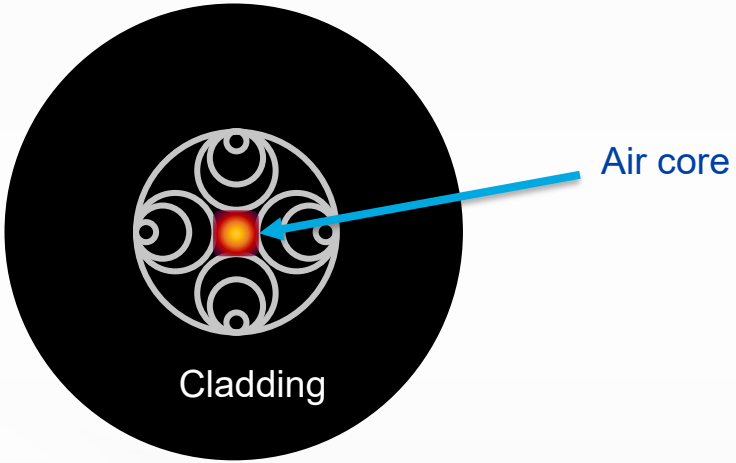
# Hollow Core Fiber Design

## Comparison with Single Mode Glass Fiber

**Single Mode Fiber (SMF)**

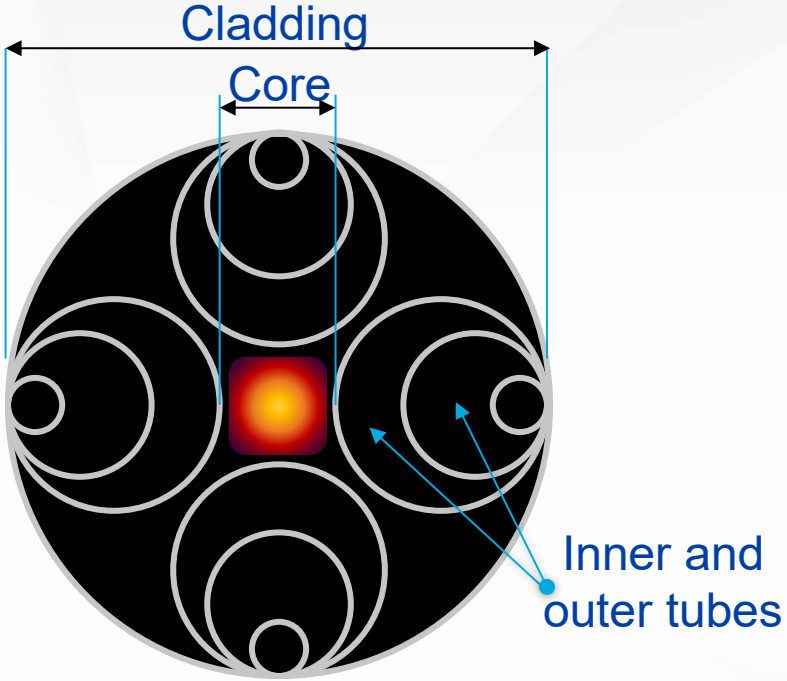



**Hollow Core Fiber(HCF)**



# Hollow-Core Fiber Structure

*Ex: 4T-DNANF*
*Fourfold truncated double-nested anti-resonant*




- **Core**
  Central air-filled region where light is guided
  *(ex: 14/15 µm)*
- **Cladding**
  Solid glass that encloses the entire structure including the nested tubes
- **Inner and outer anti-resonant tubes**
  Thin-walled glass tubes that confine light in the air-core

***Note:*** *This is an example only. There is no standard design, although the three main components mentioned to the left are generally consistent: size, dimensions, and the number of tubes may vary.*

# Technical Benefits

**Lower Latency, 30% less**
Light travels faster in air:

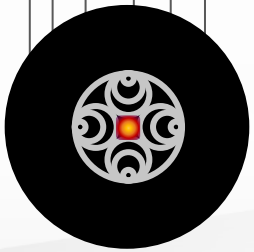
**Reduced Chromatic Dispersion (CD), 70% less**

**Similar Polarization Mode Dispersion (PMD)**

**Minimal Nonlinear Effects**
Air core minimizes light-material interaction

**Lower Attenuation at Specific Wavelengths**
Down to 0.076 dB/km (83 km), better than SMF (~0.2 dB/km)

**High Optical Power Handling**
Air core allows higher damage threshold.



**Lower latency and higher bandwidth**

# Summary

## Switching Gears:

### Are you ready for the AI Era?

- AI Data Centres require greater capacity, availability and networking performance, meaning greater testing requirements
- Fibre characterisation (CD/PMD/AP) is now **crucial to high-speed interconnect deployments**
- **Hollow-core fibre** is coming – be ready for it
- **VIAVI** offers the industry's *most compact* and *most advanced* fibre characterisation kit for DCI testing up to 800G and hollow-core fibre

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