

Data Centers Interconnect

MORE REACH, MORE CAPACITY, EVERYWHERE



Faster, everywhere: the density challenge

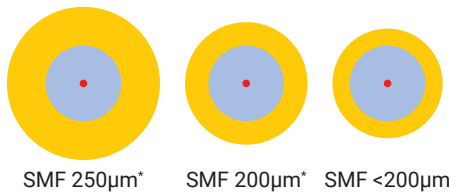
The share of AI-related DCI traffic is rising by 30% to 50% annually, driving a sharp increase in fiber-optic demand. To prevent DCI links from becoming a bottleneck, the physical layer must evolve accordingly. A breakthrough in cable densification is now unavoidable, particularly where existing ducts are limited or where leasing costs depend on occupied space. Without proper capacity planning, DCI-related capital (CAPEX) and operating (OPEX) expenses can escalate quickly.

Three key drivers can enable cable miniaturization and help overcome today's densification challenges.

Density level 1: Optical fiber's diameter

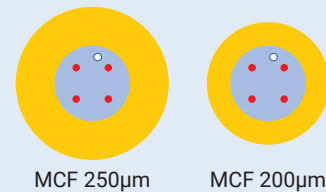
Adding value without compromising performance

Reduction of the fiber diameter by decreasing the radial thickness of the coating layer by 40% (62.5µm for 250µm fibers) to achieve a diameter of 200µm. The coating provides strength and mechanical protection to the glass cladding of the optical fiber. Reducing its thickness requires an improved material to preserve the mechanical performance of the fiber, and careful cabling to maintain transmission performance.



MCF, the next leap in densification

ACOME is working on Multi-Core Fibers (MCF), an Optical fiber containing several separate transmission cores (4, 7 or more) in a single standard glass cladding (125µm). Allows increased bandwidth without increasing the size of the cable.



Density level 2: Element fibre count

250µm*
1.81mm
24f elements*



1.35mm
Standard 12f elements*



Modularity: A limited lever for true densification

DCI cables frequently use 24- or 36-fiber elements. Increasing module size can contribute to densification, but it also complicates fiber identification and handling. With identical fiber technology, the resulting densification potential remains modest – around 10% – and is significantly outperformed by approaches based on reduced-diameter fibers.

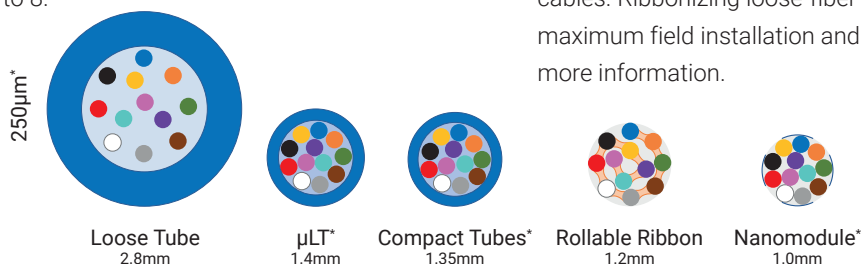
Challenges in colour identification

Twelve basic colors are used to distinguish between optical fibers. For more than 12 fibers, this identification system is supplemented by ring markings. In practice, duplication of colors slows down the fibers' management.

Density level 3: Element technology

Sub-unit architecture: A densification lever often overlooked

The diameter of conventional loose tubes varies between 2.3 and 3 mm. This assembly technology is outdated. Other assembly processes exist that reduce the cross-section of the assembly by a factor of 4 or even close to 8.



Advantages of mass splicing without the drawbacks of ribbons

The linear attenuation of an optical fiber cable is a key value in inter-datacenter transmission. It is also the main uncertainty with bendable ribbon cables, which can reach around ~0.3 dB/km at 1550 nm instead of the ~0.2 dB/km expected by standards due to residual micro-bending. Mass splicing can effectively cut splicing time for high-capacity cables by up to 70% but it is not exclusive to ribbon cables. Ribbonizing loose-fiber cables is a widespread practice, offering maximum field installation and repair flexibility. Contact ACOME for more information.

*Levers already available at ACOME

Reach further, deploy faster: the distance challenge

As DCI footprints extend from metro to regional and long-haul, distance becomes a key engineering variable. The passive layer ultimately sets real-world reach, latency, and site spacing. With low-loss fibers, efficient cable designs, and wide-band-ready passives, ACOME enables longer spans, fewer active sites, and faster rollouts.

Distance level 1: 800G-ready links

Same network ports, more real-world kilometers.

Modern coherent transceivers are increasingly used for metro and regional DCI. **Actual maximum reach and turn-up simplicity depend strongly on the passive plant**: fiber attenuation and effective area, bend robustness, and wavelength-band readiness. **By optimizing the passive layer** (cable design, fibre specifications, clean routing), operators can **optimize their transmission performance and unlock longer spans at a given bit rate.**

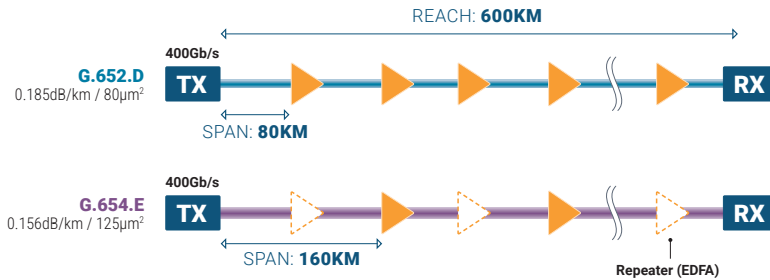
What ACOME enables

- ➔ **Low-loss, large-effective-area fiber options** to improve OSNR budgets.
- ➔ **Cable and optical routing** (ODF, racks, splice trays, installation) **designs** that minimize micro/macro-bending during fiber management for **repeatable field performance.**
- ➔ **Wide band ready passive components** to keep future active layer spectrum expansion open.

Distance level 2: Limiting ILAs and Regenerators

Fewer sites, the physics is on your side.

Each active site (ILA/regeneration) incurs CAPEX, OPEX, and energy costs. **The passive lever** consists of reducing loss per kilometer and sensitivity to non-linearities on the fiber in order to **space out sites** and **reduce their number**, regardless of the optical equipment used.



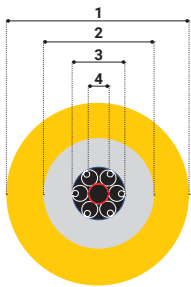
Typical link configuration when switching an existing link from G.652.D to G.654.E fibre for the same bit rate

What ACOME enables

- ➔ **G.654.E long-haul fiber** (ultra-low loss, large Aeff) integrated into robust terrestrial cables to **increase the spacing** between active sites.
- ➔ **Cable engineering** (materials, protection, structure) for long-term **performance stability** and **environmental resistance.**
- ➔ **Wideband-ready passive components** to **push the limits** when operators extend wavelength band and amplification **without changing the cabling.**

Distance level 3: Ultra-low-latency fiber, beyond limits

Hollow-core fiber: where latency pays



- 1 Coating
- 2 Cladding
- 3 Air cladding
- 4 Hollow core

Hollow-core guides light in air, cutting latency by ~30% while recent designs show record-low loss. It's ideal for premium DCI corridors compared to standard SMF (finance, AI) and complements SMF capacity elsewhere. ACOME is working on HCF to engineer the passive path (cable design, bend/strain control, connectorising, low-loss installation) so HCF delivers its physics in the field.

Scan to discover our whitepaper



Ultra-low latency, ultra-selective adoption?

- ➔ **Emerging ecosystem:** connectors, splicing, testing, and active integrations are still evolving, restricting HCF to selective high-value routes.
- ➔ **Targeted adoption:** limited supply and higher costs mean HCF is viable mainly where latency has measurable economic value – finance and real-time AI.

DCI-Ready cable designs, boosted by ACOME's densification levers

From micro-module to high-density: unlocking new capacities

ACOME Compact-Tubes cable constructions – whether blown, pulled or rodent-proof – now support the full set of densification levers: 200 µm fibers to reduce diameter, 24-fiber modules to go further in this reduction, and Nano-modules to push compactness at its maximum. Same structures. Higher density. Wider applicability.

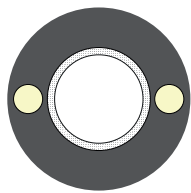
Two field-proven cable families – now density-ready

A cable structure platform developed for 250µm, 12f module and Compact-Tube, and proven widely over several decades, now capable of integrating the three levers of densification (200µm, 24- fiber modules, Nanomodule)

Family 1. Duct cables (blown and pulled)



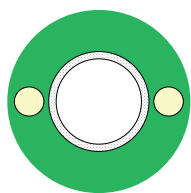
Outdoor plant duct cables



The **UND15xx series** is one of the **most deployed duct cable** platform – proof of its robust, blow-and-pull optimized design. By applying ACOME's densification levers (200 µm fibers and Nanomodule),

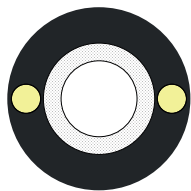
its capacity jumps from 864 to **1,728 fibers** while even reducing the diameter from 19.5 mm to 18.5 mm – a **140% capacity boost in density**.

Indoor / outdoor LSOH duct cables



The **UND1658 cable range** is designed to meet the supply needs of campuses and DCI link ends, enabling the supply of datacenters. Available with up to **864 fibers** and **B2_{ca}** fire rating.

Enhanced outdoor pulling cables



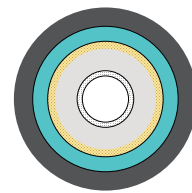
The **UNC15xx series** is engineered for the most demanding pulling conditions, delivering between **1.7× and 3.4× the tensile strength of the UND15xx range**, depending on fiber count.

Traditionally limited to 144 fibres, this platform can also **double its capacity** when equipped with ACOME's densification levers.

Family 2. Anti-rodent armored cables



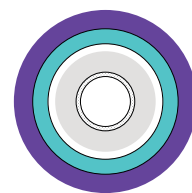
Outdoor steel armored cables



For years, the **CCC137x series** has delivered reliable performance in **sewers, direct-buried routes and rodent-prone areas** where fire regulations do not apply.

With densification levers, its traditional 288-fibre design can now scale up to **720 fibers in just 17.5 mm – a 150% leap in capacity** without changing the cable's rugged architecture

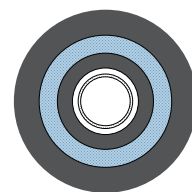
Indoor LSOH armored cables



CCC1781 combines **B2_{ca} s1-a1-d1** fire performance with steel-armored protection, making it the preferred option for **datacenter feeds routed through subway or service tunnels**. And, like its

outdoor version, **it can scale up to 720 fibers** using ACOME's densification levers.

Dielectric anti-rodent cables

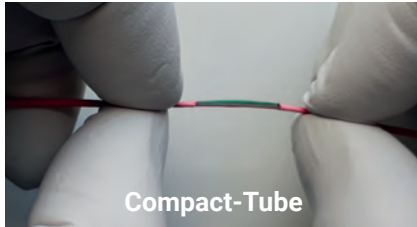


The **CCC1575** range uses a hot-melt coated glass-fibre barrier that provides **full dielectric rodent protection** with greater flexibility and tensile strength than steel-armoured CCC137x designs.

With **288 fibres in a 15.5 mm diameter** – and densification **potential up to 720 fibres** in the same footprint – CCC1575 is the most compact cable in its family.

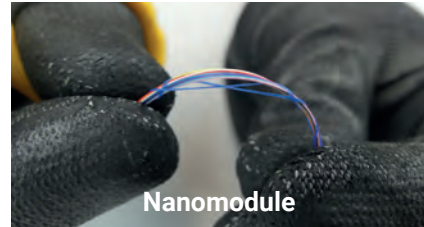
Fiber assembly: the densification lever inside the cable

Why Compact-Tube and Nanomodule technologies unlock new capacities in ACOME cables and make fiber management easier in passive cabinets.



Compact-Tube

Fiber assembly technology directly influences density, mid-span access, splice count and cable handling – on the field and inside ILA racks.



Nanomodule

Two assembly technologies, one goal: compact and safe fiber handling

Compact-Tube – The proven standard for high-density cables

Key characteristics

- Bundle with **no shape memory, no kink effect**
- **Low grease** (no-gel version available): clean handling
- Mid-span access: easy (drop fibers without cutting all modules)
- **Reduced coil diameter** (predictable performance in ILA drawers)
- Ideal for 24-fiber variants in densified platforms

Why this matters for DCI, long-haul and regeneration sites

- **Compact fiber routing in restricted huts:** Compact-Tube and Nanomodule designs reduce slack and ensure tight-radius safe handling in dense drawers.
- **Safe bend-radius control near active layer optical equipment:** assemblies without shape memory behave predictably around sensitive optics.
- **Clean fiber interfacing,** easier splicing, less grease, and stable routing: cleaner optical paths inside high density shelves.
- **Easy maintenance with minimal site visits:** fast mid-span access and cleaner modules reduce intervention time in remote huts.
- **Long-term reliability (beyond 10-15 years):** stable materials, no gel migration, and controlled microfiber routing ensure durable performance.

How fiber assembly links cable platforms and fiber management equipment

- Duct cables (UND15xx / UNC15xx)
- Armored cables (CCC13xx / CCC15xx)
- HD patching drawers (iTOM-HD / iTOD-HD)
- Splicing drawers (iTEP / iTES)
- LGX racks (iROC, 19" LGX)

All can embed Compact-Tube or Nanomodule assemblies for higher density.

Nanomodules – Maximum compactness and easiest mid-span access

Key characteristics

- Ultra-compact units (~20% smaller than rollable ribbons)
- **Minimum storing space** (≤ 10 mm coil radius)
- **No gel,** no shape memory, no kink effect
- **Fast fibre access, no-risk mid-span:** major productivity gains



Nanomodule received the award of the innovation of the year 2024 from the UK AInet association INCA after the demonstration of major benefits from deploying cables embedding Nanomodules on the field

Coiling 12 elements (144F cable)



Compact-Tube

The assembly inside the cable drives the efficiency inside the racks. Better modules = easier splicing, cleaner drawers, safer bends, faster maintenance.

Choose the right assembly technology for your DCI fiber paths.

Micro-Duct blowing: maximum reach, minimum risk

ACOME Group delivers a sovereign, end-to-end ecosystem for micro-duct blowing – micro-ducts, accessories, and blown fiber cables validated together on full-scale test tracks.

ACOME Group, the one-stop manufacturer of the blowing world

Microducts manufacturing plants 
United States and Denmark

Cable manufacturing plants 
France

Blow Test Tracks 
France

Microducts and accessories that safeguard blowing performance

Single ducts from 7 to 25mm OD 3.5 to 20mm ID



- Thin wall and thick wall
- Ribbed or smooth inner surfaces
- PEHD or Indoor LSZH (4/2.5 to 14/10mm)



Bundles up to 25 ways
Standard or custom sizes available

Markers

For accurate location, identification, and long-term traceability of buried cables, ducts, and pipes to help in maintenance, quick access, and preventing accidental damage during construction or excavation. Different solutions available, contact us.

Accessories



Connectors*



End Caps*



Reducers

(*Gas Blocker or Indoor versions available)



Branch support elbow

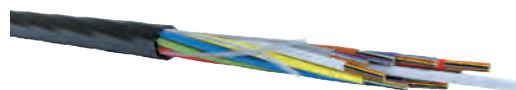


Divisible Seals 12-14mm / 4-10mm

The blowing-ready cable families

Cable	Fiber diameter	Element type	Element fiber count	Cable capacity per duct size				
				10/6mm duct	12/8mm duct	14/10mm duct	16/12mm duct	18/14mm duct
MCD1520	SMF 250µm	µLT	12f	–	12 to 96f	12 to 192f	144 to 288f	144 to 288f
MCD1522HD	SMF 200µm	µLT	12f	12 to 72f	12 to 144f	144 to 288f	144 to 288f	288f
MCD1521HD	SMF 200µm	µLT	24f	–	144 to 192f	144 to 288f	192 to 576f	288 to 576f

The **MCD152x series** is a micro-loose tube based blown cables specifically designed for long distance blowing in microducts.



Validated on standardized, industry-recognized blowing tracks

The guarantee of an approved cable/pipe combination on standardized routes

ACOME has been using a blowing circuit (IEC 60794-1-21 - E24 method, Vetter-like test track) for cable designing, testing, and certifying its cables and microducts, which reproduces IEC and Vetter standardized routes. **ACOME's blowing test center** has just implemented the brand new IEC 60794-1-124 Method B routes with a three-mandrel layout introduced to simulate realistic routes.



Passive solutions for Long-Haul ILA and Regeneration sites

High-density fiber management for limited space, fast maintenance, and clean optical paths.

ACOME Connectivity - The sovereign passive backbone of DCI long-haul sites

Manufacturing plants  France

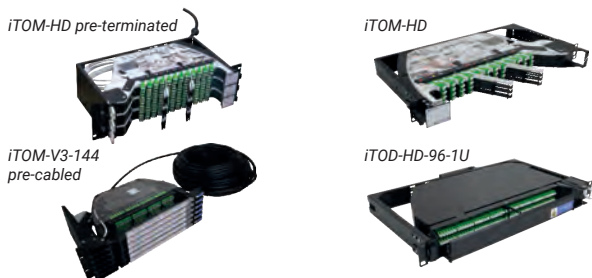
Delivering high-density, front-accessible, modular solutions for the world's long-haul amplifier and regeneration stations.

What matters in an ILA/regeneration site:

- Compact fiber management in restricted-access huts
- Safe bend-radius control for cross-device connectivity equipment
- Clean fiber interfacing
- Easy maintenance with minimal site visits
- Long-term reliability (10–15 years)

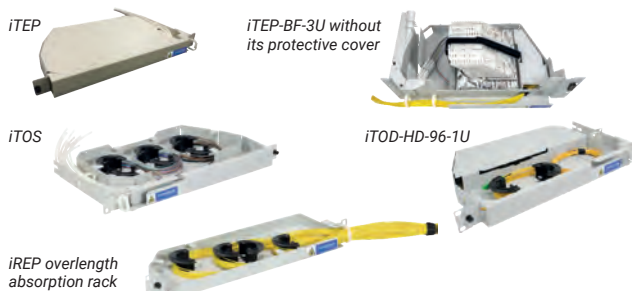
Passive modules for modern DCI sites

High-density patching (front-access)



- High-density pivoting patch panel (96F/144F) for safe bend-radius and rapid intervention in narrow huts.
- Ideal for diverse cross-device connectivity.

Splicing and fiber storage



- Modular splicing drawers and slack-management trays for stable routing, clean pigtail organization and long-term reliability.
- Perfect for EDFA/OSC pigtails and coherent patching.

WDM, OSC and Monitoring Layers



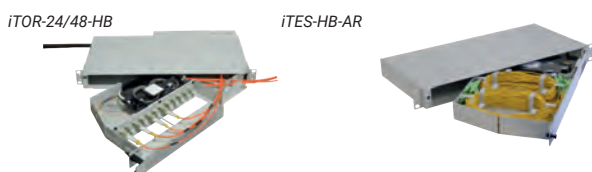
- Passive WDM rack for OSC add/drop (1510/1625 nm), taps, splitters, and monitoring ports.
- Vendor-agnostic ensures integration with any amplifiers or optical add-drop multiplexer platform.

Modular racks



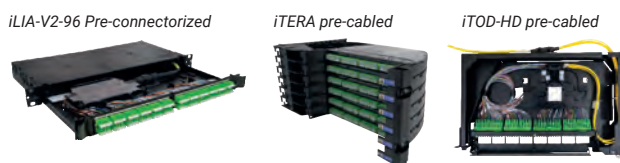
- High-capacity optical rack for passive modules: MUX/DEMUX, splitters, circulators, OADM, monitoring blocks.
- Central to any scalable ILA or regeneration frame.

Rural and harsh-environment protection



- Anti-rodent drawers securing fiber and patchcords in unmanned huts and underground corridors.
- Designed for utility routes, railways, energy backbones.

Fast deployment: pre-connectorized drawers



- Factory-tested plug-and-play drawers reducing splicing and truck rolls.
- Ideal for rapid commissioning, SLA-sensitive routes, and remote huts.



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