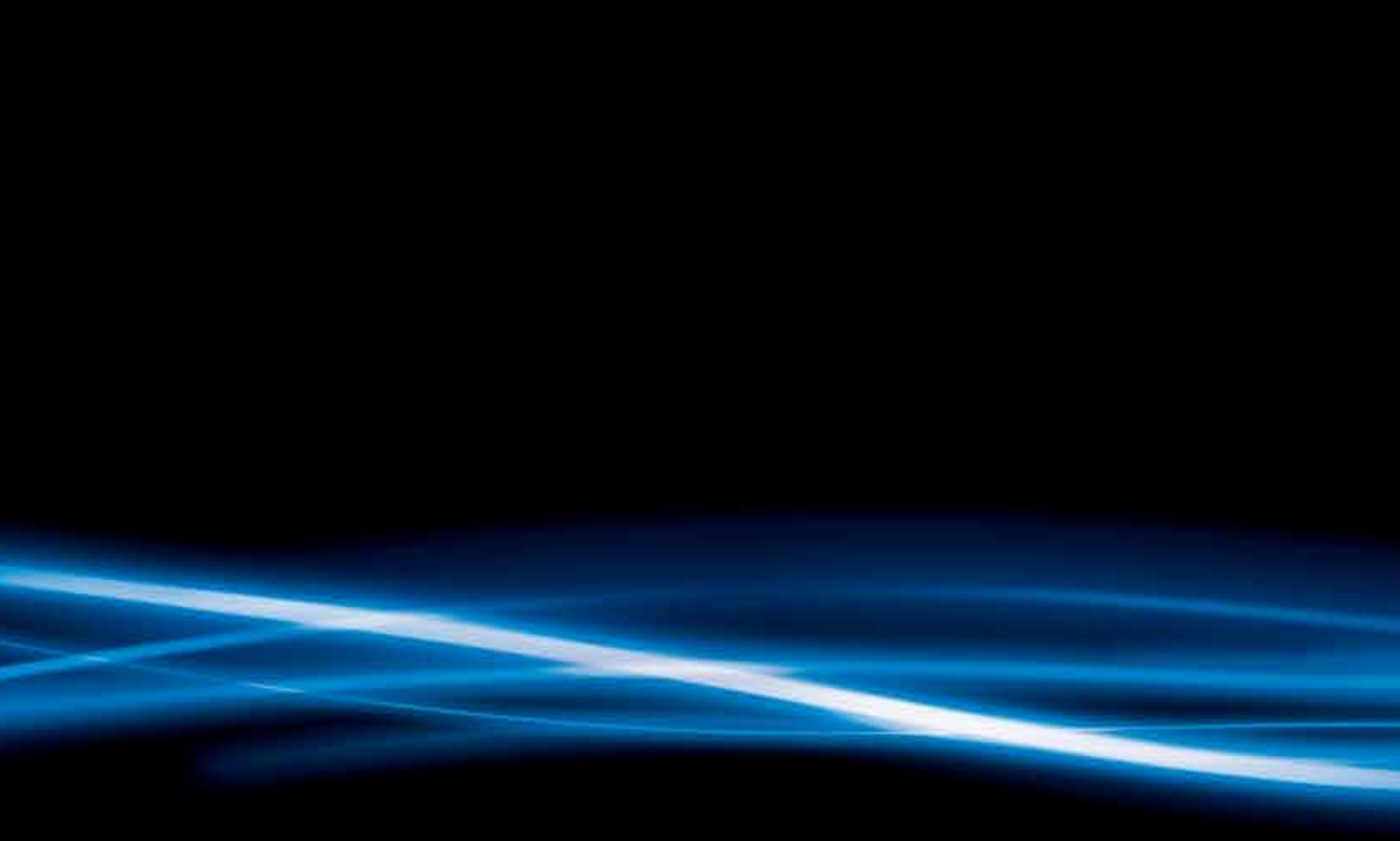
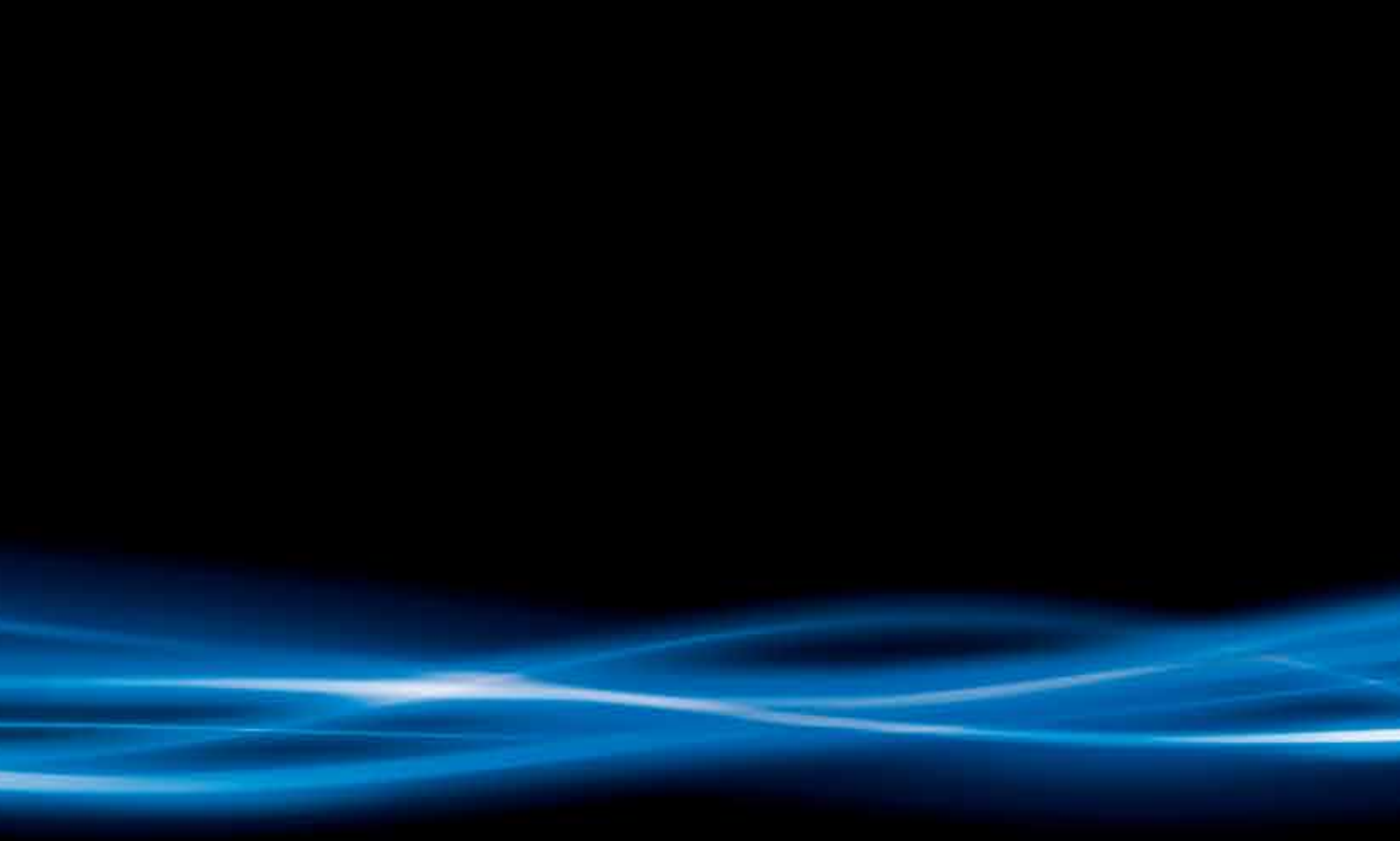
LANmark
Fibre Optic Solutions

Accelerate business
at the speed of light

Nexans



Products, support services, experience and a global presence stand behind your business providing you with the widest choice of network solutions for any type of application or need…



- Our past makes you future-ready
- Cabling design excellence
- Understanding your needs
- Office fibre solutions
- Data Centre fibre solutions
- Value worth having...
- Reasons to choose Nexans

Nexans Cabling Solutions

Opticable

Competence Centres
USA • UK • Belgium

Manufacturing Units
Worldwide

Sales Offices
Worldwide

Data Communications
Competence Centre

Nexans Research Centre

Our past makes you future-ready

As a fibre optic technology leader for more than 30 years, Nexans has the experience to take your business into the future with cables, accessories and sophisticated network management systems that are ready today for tomorrow's innovations. Nexans knows fibre. We've guided development of optical fibre technology for communications since its inception in the 1970s. As a result of our long term experience, our reputation for quality fibre products instils customer confidence that their networks will perform reliably, able to handle whatever tomorrow brings. Skill, proficiency and future-ready development are continuous processes powered by Nexans' Research and Competence Centres in Europe and North America. They work as one to make you operationally efficient, commercially viable and ahead of the technology curve.

International facilities

- Nexans Cabling Solutions R&D laboratories in Brussels and the UK, focusing on network strategy and design, standardisation and energy efficiency. Horizontal networks, backbones and supporting solutions have been conceived and produced at these facilities to reinforce major IT infrastructures worldwide.

- Nexans Opticable, the company's manufacturing arm that for 30 years has specialised in fibre cable manufacturing from a sophisticated Belgian plant. It's among the world's first dedicated fibre cable production sites.

- Nexans Data Communications Competence Centre (DCCC), New Holland, Pennsylvania (USA), specifically equipped to research and test new products and emerging technologies. DCCC investigates if new connectivity units and cables meet or exceed the latest Ethernet protocols.

  Product compatibility with active equipment is also studied using bit and frame error rate testing. Performance models are modified based on test results.

- Nexans Research Centre (NRC), Lyon, France which supports global R&D activities particularly in the areas of polymers and related technologies such as material science. It also provides technical support for modeling and simulation.

All the right qualities from a unified source reinforce Nexans' expertise in Data Centres and offices…

Setting standards for the next trends…

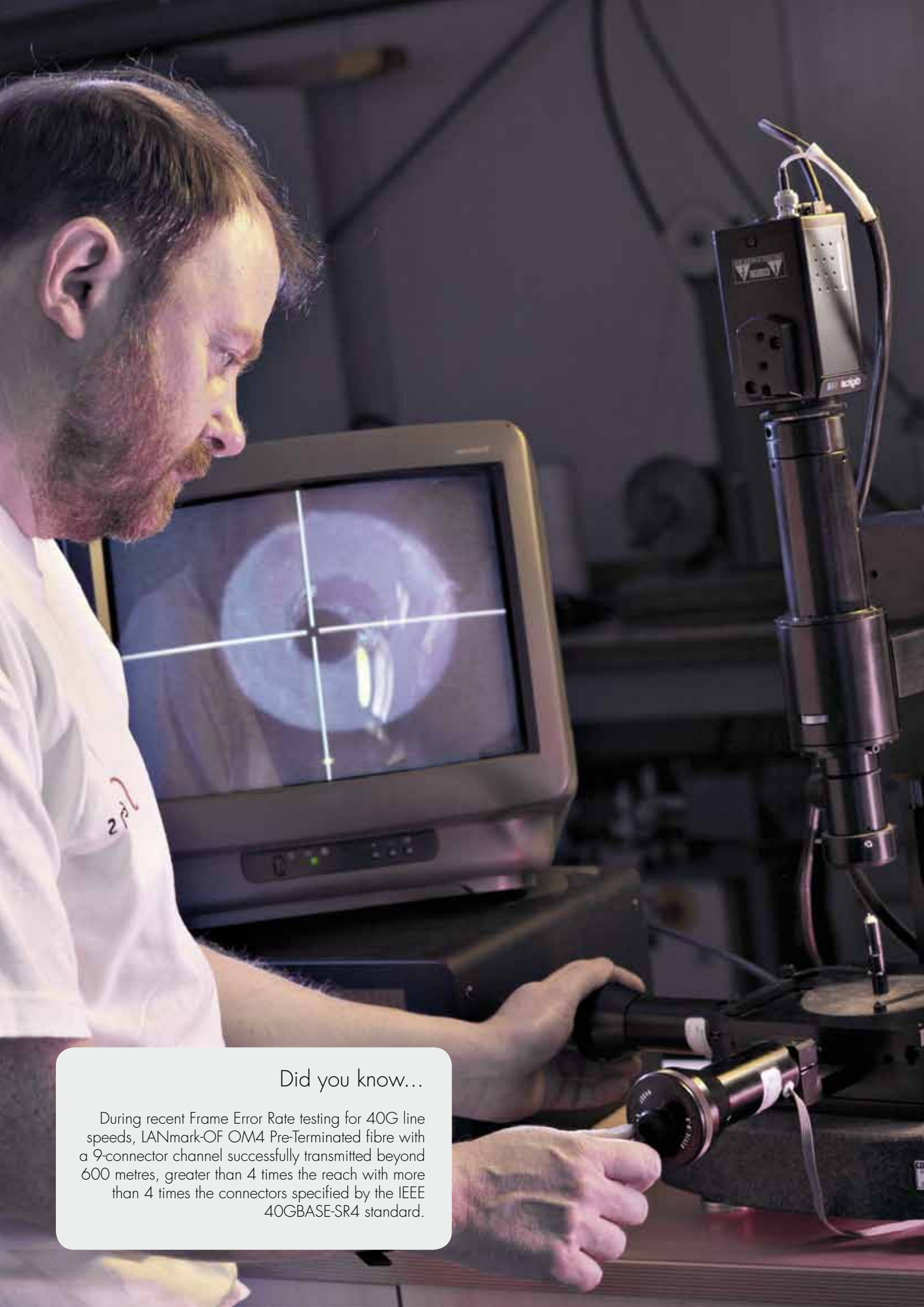
Fibre optic production, installation and maintenance standards are established and continually updated by engineering groups and committees worldwide. As a technology leader in fibre and copper systems, Nexans has for years participated and guided the shaping of many of today's standards.

In particular, Nexans helped direct the standards defining fibre and cable performance as well as specifications for enterprise and Data Centre networks. Nexans also participates in the IEEE committees defining protocols for the next generation of high speed applications such as the recently approved IEEE 802.3ba for 40/100G.

In addition, Nexans joins other world-class corporate IT innovators like Cisco, Intel, Extreme e.g . - as a principal member of the Ethernet Alliance. This organisation serves the IT industry by supporting the continued incubation, development, interoperability testing and support of technologies based or dependent upon Ethernet standards.

"We proactively collaborate with R&D, and any other Nexans department to analyse, evaluate and recommend actions to make sure our products are fit for market."

Dr. Joost Grillaert,
Product Manager Fibre Optic Solutions
Nexans



Did you know...

During recent Frame Error Rate testing for 40G line speeds, LANmark-OF OM4 Pre-Terminated fibre with a 9-connector channel successfully transmitted beyond 600 metres, greater than 4 times the reach with more than 4 times the connectors specified by the IEEE 40GBASE-SR4 standard.

Cabling design excellence

As fibre evolves, cable designs as well as enhanced tests of fibre performances become crucial, not only to exceed system requirements but also to ensure long life time.

The technology challenge

Lasers, and particularly the more cost effective Vertical Cavity Surface Emitting Laser (VCSEL), excite only certain fibre modes. In this multimode transmission method supporting voice, video and data, different signals bounce along the walls of the cable's core.

This is why it's extremely important that light travelling through the different modes excited by a certain VCSEL arrive at the exact same time at the cable's end. If light doesn't arrive evenly, the pulses for the ones and zeros will broaden and overlap, making them impossible to distinguish at the receiver end.

Practical solutions for different needs

Whilst some think all fibre cabling is the same, Nexans sets itself apart by what it puts around the fibre to meet your needs for optimal bending, pulling and protection.

- Pliable protective sheathing allowing a tight bending radius for demanding installations in cramped spaces.
- Superior resilience when pulling cable through packed conduits, across walls or underground.
- Excellent resistance to flame/fire, with low smoke/zero halogen (LSZH) jacketing for superior indoor protection.
- Exceptional outdoor resilience to soil, water, UV sunlight and rodents. Cables are protected with corrugated steel (UC) or dielectric (UD) armouring.

Nexans manufactures and continuously tests its fibre products to exceed all requirements for a flawless, unified network with strong durable links.

Tested beyond requirements

Testing with differential mode delay is crucial to determine the fibre's performance. Standards specify two methods: mask/template and weighting test. Only one is required to qualify for OM3 or OM4 according to the standards. Unlike other manufacturers, Nexans' qualifies its fibres using both measurements for superior reliability that ensures high level performance.

Ready for tomorrow…

Nexans' Data Communications Competence Centre (DCCC) performs additional tests on selected samples to determine if bandwidth measurements result in actual transmission performance for 1, 10, 40 and 100G Ethernet protocols. Based on bit and frame error measurements, the cables and connectivity component's ability to meet the low bit error loss permitted by the latest protocols can be verified. These tests guide Nexans in calculating the distances that can be reached.

"Our technical support group continually sharpens its expertise through feedback from real-world projects. This helps guide product improvements and facilitates high-end support to business partners and installers."

Didier Willems,
Manager Project Design
and Technical Support Department Nexans

"Our new Terminal 3 has a strong, flexible and future-ready communications infrastructure from Nexans."

Andy Chin
Engineer, Specialised Airport Systems
Civil Aviation Authority of
Singapore Changi Airport

Understanding your needs

Network infrastructure is more important than ever to IT managers to ensure smooth, efficient service whilst being future-ready for voice and data convergence and storage area networking.

One stop shop

The increasing data transfer between workstations, telecommunications rooms and Data Centres requires high-bandwidth. Building networks need reliable fibre infrastructure which will easily have a lifetime of more than 10 years. Being ready to run new applications more than a decade out requires a scalable, flexible and future proof system. Further key requirements are high density, ease of deployment and installation combined with a certified and warranted solution. But network infrastructure is more than just the fibre.

It is vital to have a one stop shop – a supplier with expertise in every segment. Nexans Cabling Solutions offers fibre, copper, intelligent infrastructure management and more with added value. Many case studies worldwide document our achievements.

Scalable and future proofed

Recabling to handle future bandwidth is expensive, time consuming and jeopardizes a businesses' ability to perform. Cable installed today should have adequate headroom to handle bandwidth demands for decades to come.
Choose a proven partner that can support applications up to 40G and beyond as well as prepare for new technologies, devices, standards and management demands for better environmental compliance and data security. Nexans LANmark fibre solutions will take you there.

Make your network more secure

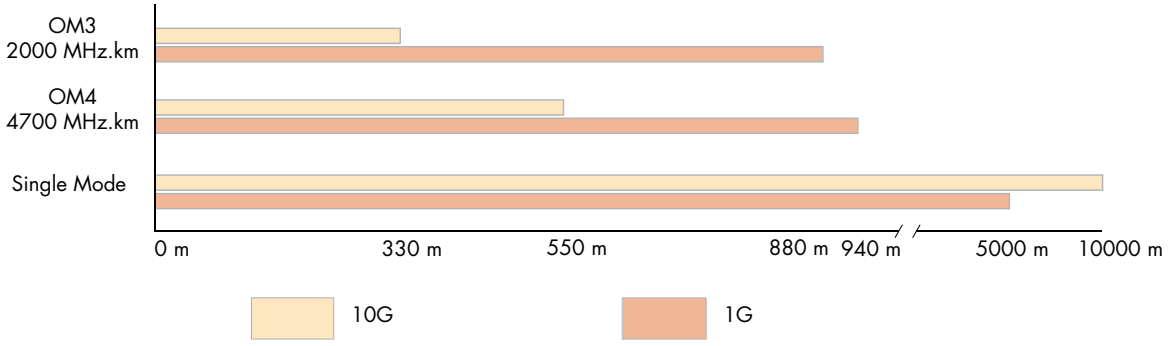
- Intelligent Infrastructure Management

Do you really know which devices are on your network? Do you get an alarm if a cabinet temperature rises beyond a critical point? Can you track all moves, adds and changes within your network in real time? These are important issues that can mean trouble if not monitored. LANsense is the world's leading Intelligent Infrastructure Management solution which ensures that your network works properly, the way you want it to work.

- Lockable connectivity

If you want to prevent accidentally unplugging your most sensitive fibre links, why not simply lock them? Use our colour coded secure lock system. It's simple to use and mechanically locks your patch cords and pigtails. And every coloured cord has its own matching key to unlock it.

Extended distance support



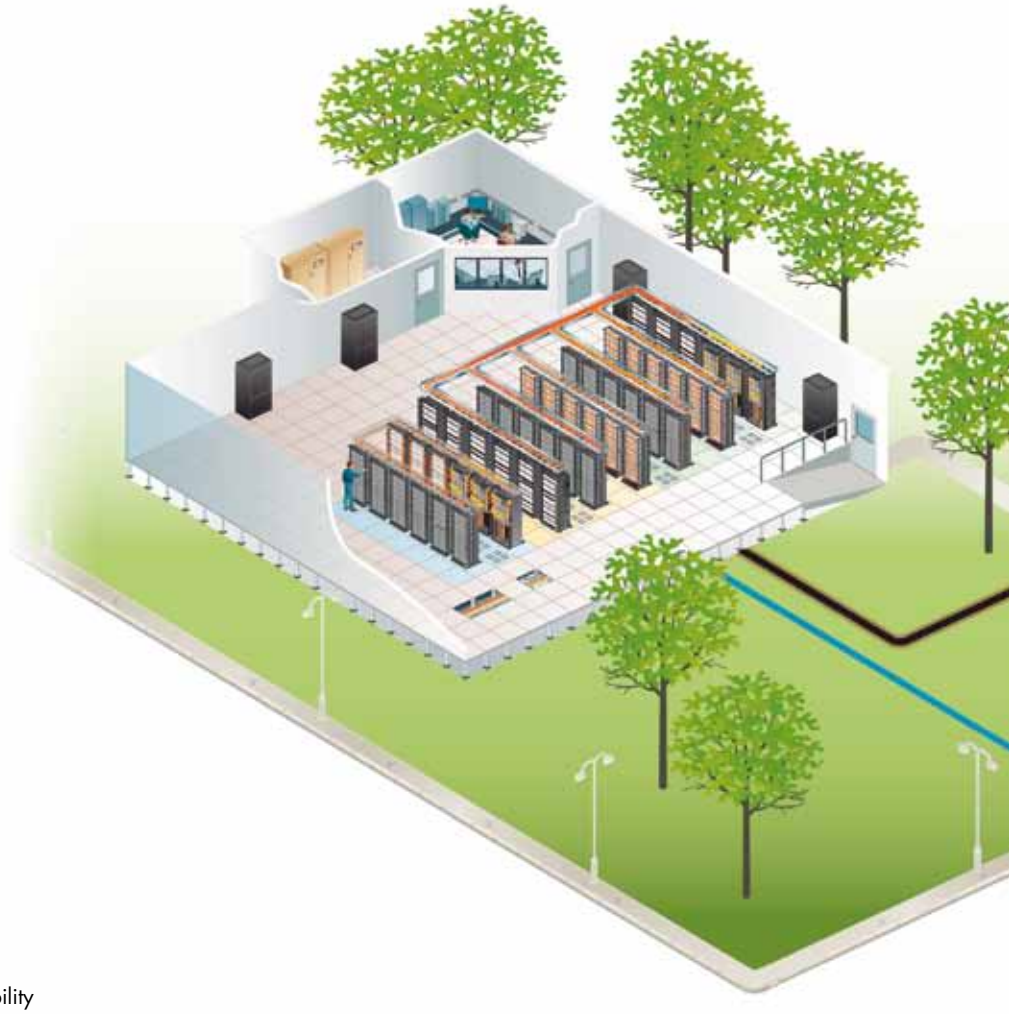
LANmark-OF Solutions fo

MPO Connectivity

- High density panel with 4 MPO modules
- Up to 48 duplex LC in 1U
- Integrated patch cord guide
- Low loss MPO connectivity available

Pre-Term Trunk MPO-MPO

- Up to 96 fibres in SM, OM3 and OM4
- Polarity maintained by its advanced design
- Small cable to reduce space requirements
- Flexible cable with small bending radius



Preloaded Angled Patch Panel

- High density: up to 96 LC
- Removable tray for ease of installation
- Preloaded with adaptors
- Patch cords guided to the side for improved visibility

LC Pre-Term Cable

- Tight Buffer Indoor cable
- OM3, OM4 and SM fibres, up to 24 cores
- 100 % tested, test report included with Pre-Term
- 900 µm fan-out for installation inside patch panel
- 2mm fan-out for patching

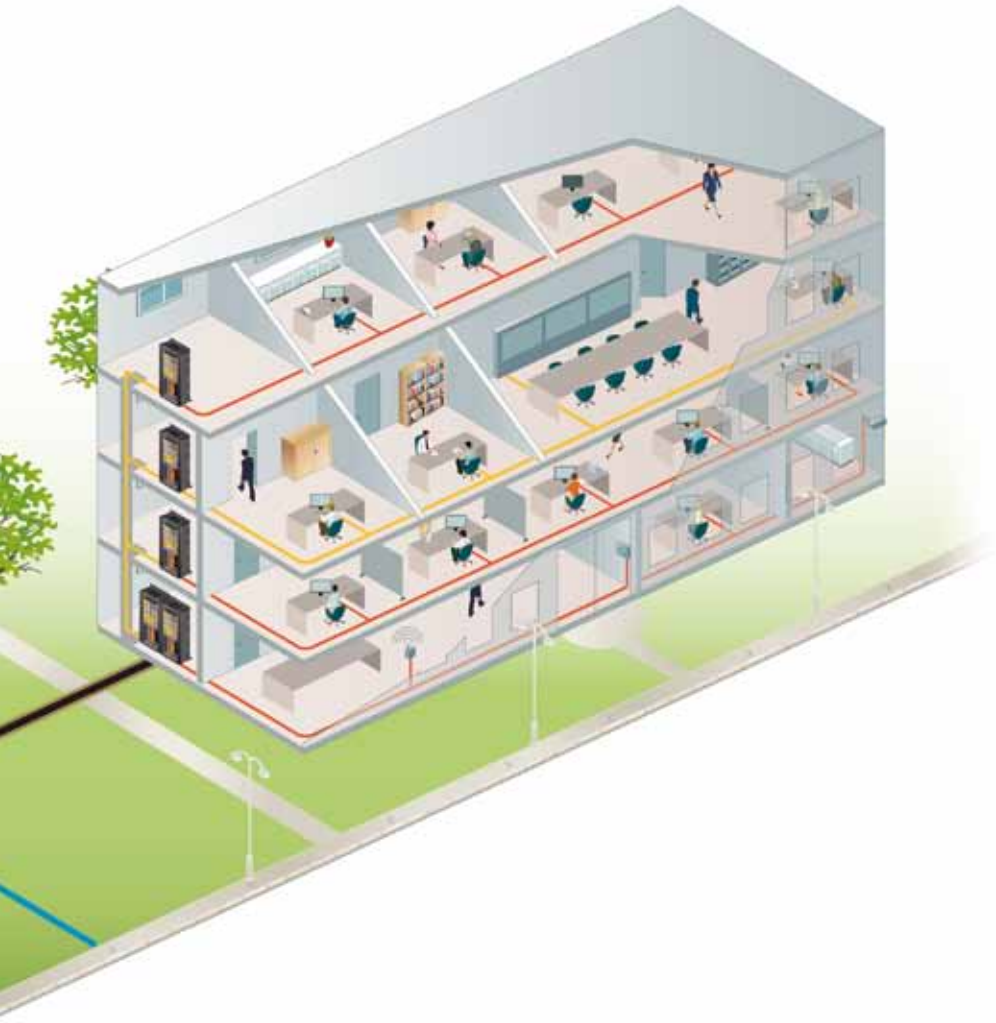
Slimflex Patch Cord

- Small bending radius of 7,5 mm
- Small and round patch cable
- Advanced flexible jacket less prone to damage
- Low loss patch cord for additional headroom

Pigtails and Connect

- Maxistrip and Tight Buffer p
- Anaerobic connectors
- ST, SC and LC
- Single mode and multimode
- Bulk and individual packagi

or Office and Data Centre



Snap-In Patch Panel

- Snap-In adaptors for fast installation and flexibility
- Up to 12 duplex SC or 24 duplex LC Snap-In adaptors
- Sliding and removable tray
- Optimised for splicing, direct termination and Pre-Term

Outlet

- Suitable for all Snap-In adaptors
- 1 x duplex SC or 2 x duplex LC
- Optimised for direct termination or splicing

Unitube Dielectric (UD) Cable

- Outdoor cable
- Full dielectric armour
- Available in all fibre grades and till 24 fibres
- Fully waterproof, rodent and UV resistant

ors

igtails

ing for SC and LC connectors

Tight Buffer Indoor Cable

- Excellent fire and flame retardant properties
- Aramid yarns for ease of installation
- Designed for direct termination and splicing
- Up to 24 fibres and available in all fibre grades

Micro-Bundle Universal Cable

- Indoor cable and outdoor installation in a duct
- Fully waterproof, rodent and UV resistant
- Designed for splicing with pigtails
- Flame and fire non-propagation

Office Fibre Solutions

As bandwidth demands increase from 10 to 40Gbps and beyond, Nexans offers a highly efficient blend of easy to handle fibre cables, connectors and accessories to meet all current and future needs.
With tight bending radius and simplified connectivity, installations go faster and more proficiently with Nexans' wide range of user friendly cable constructions. Additionally, Nexans supports installers with in-depth manuals, field test procedures, training and advice on fibre connection, cleaning and inspection.

Tight Buffer or Micro-Bundle – it's up to you

In addition to its well-known Tight Buffer fibre cables, Nexans now has a new alternative – the innovative Micro-Bundle. While Loose Tube remains a good construction, new Micro-Bundle technology offers many advantages in comparison.

Less space – smaller bending radius

The key of the new design is an advanced, flexible and smaller tube with thinner wall thickness. The diameter of Micro-Bundle tube filled with 12 fibres is roughly the same size as one Tight Buffer fibre. With this flexible construction the bending radius and the diameter of the cable is reduced by 50 % compared to traditional Loose Tube designs.

Optimised for horizontal and vertical installations

Micro-Bundle cables contain much less gel than traditional Loose Tube cables. Therefore, there is no drip-effect making it perfect for horizontal as well as vertical installations. And of course, almost no gel means Micro-Bundle cables are easier to clean.

Indoor or Universal

Both versions – Tight Buffer and Micro-Bundle - are available as Indoor and Universal cables. Indoor cables feature installer friendly aramid yarns. Universal cables are optimized for both indoor use as for outdoor installation in a duct.

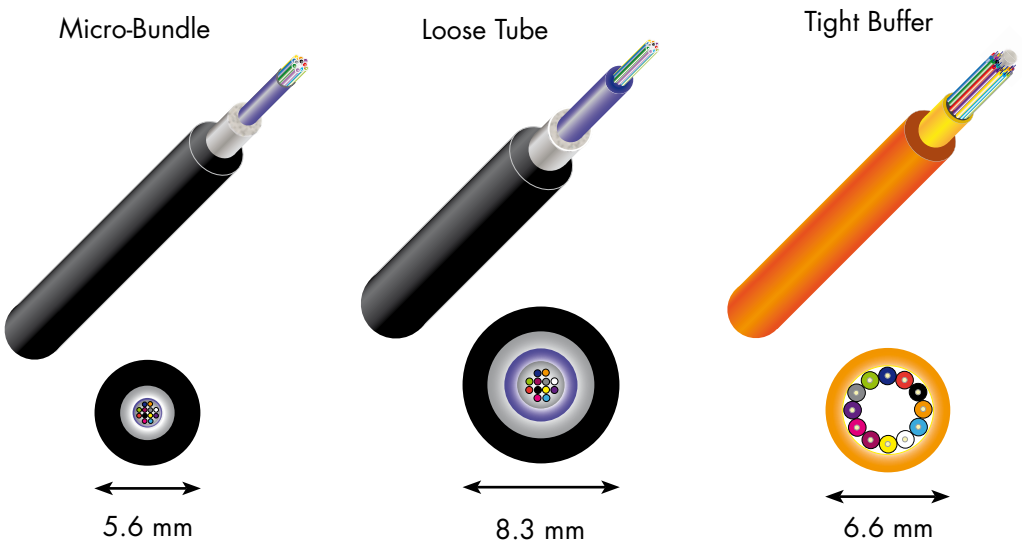
Excellent fire and flame retardant properties

Both the Indoor and Universal versions of the Tight Buffer and Micro-Bundle range have excellent fire and flame retardant properties and comply with the standards IEC 60332-1 and -3.

SAUR Group (France)

"A high quality cabling infrastructure ensures reliable data reproduction."

Régis Moine,
Specific Operations Manager,
Saur Group's Systems Information Management Division



Complete range of Connectivity solutions

When quick connectivity is required, Nexans offers complete systems of cables and splice cassettes, metal and heat shrink splice protectors, pigtails and patch cords designed for easy use.

LANmark-OF splicing solutions

Splice cassettes are optimised for LANmark-OF pigtails and are easily integrated inside the LANmark-OF patch panels. Pigtails are available for all connector and fibre types.

LANmark modular Snap-In system

Nexans has designed a diverse assortment of outlets, distribution boxes and patch panels which use the same modular Snap-In adaptor.

The modular approach simplifies stock and logistics, and enables different connector or fibre types to be mixed in the same equipment.

By eliminating traditional screwed adaptors, LANmark-OF Snap-In connectors save 1 to 2 minutes installation-time per adaptor, significantly reducing cost on site.

	Tight Buffer	Micro-Bundle	Loose Tube
Indoor	Tight Buffer Indoor	Micro-Bundle Indoor	UC LSZH
Universal (Indoor and outside in a duct)	Tight Buffer Universal	Micro-Bundle Universal	
Outdoor with corrugated steel			UC PE
Outdoor with dielectric armouring			UD PE

GROENINGE's Hospital (Belgium)

"We have placed a 10G glass fibre in the spokes which connect the data stations to each other, making the whole network resilient."

Wim Engelen
Manager of Technical Systems, AZ Groeninge

LANmark-OF

Data Centre Fibre Solutions

Never have Data Centres faced more uncertainty. Innovations such as public/private cloud computing, virtualisation, protocol convergence and I/O consolidation all raise questions about bandwidth, latency, and security. Added to this are evolving OM3 and OM4 fibre types and expanded use of MPO and LC connectivity.
Overriding all these changes is technology convergence – each year, more devices and applications are connected to the network in different environments like offices, production plants, airports or ships.
There are roughly 20 new standards addressing issues like 40/100 Gb Ethernet, Provider Link State Bridging (PLSB) and Transparent Interconnect of Lots of Links (TRILL) networking. A high performing, flexible fibre infrastructure is needed to support your Data Centre's growth!

Solutions for six key Data Centre issues

Solutions from Nexans support the operational speed, flexibility, reliability and future-readiness of today's Data Centres:

1. Support for complex configurations

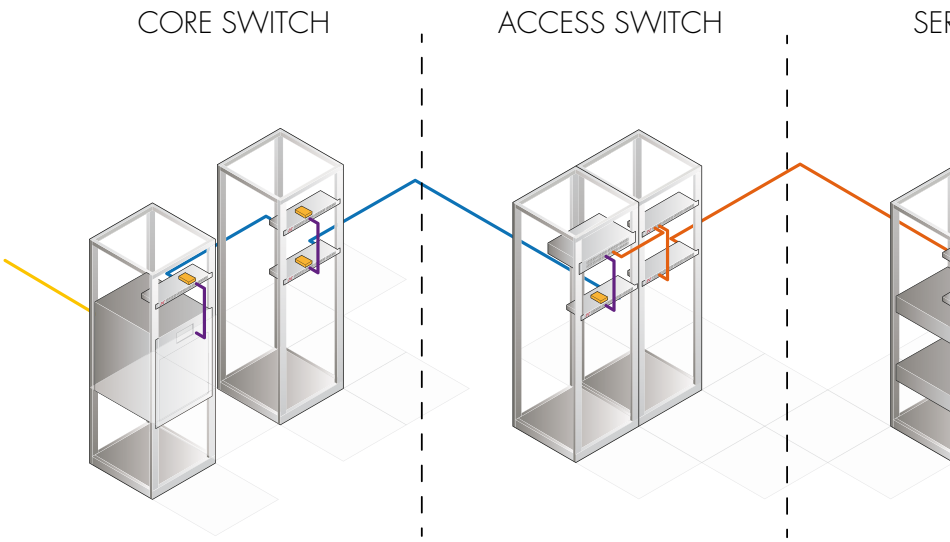
Multimode remains the fibre transmission choice for Data Centres due to the higher costs of single mode transceivers. Nexans OM4 fibres support multimode over longer distances than other fibre products, which give Data Centre designers more freedom to create an optimal facility. It expands fibre's ability to link server to SAN, server to access switch, or access to core switch. Effective bandwidth is also higher with Nexans OM4.
Factory terminated assemblies feature low loss connectivity with a maximum of 0.35 dB connectivity loss for every fibre, exceeding standard requirements. The reduced loss per connection results in channels with an increased number of connectors to support complex configurations and advanced applications.

	2 connections (direct connection)	4 connections (1 cross connect)	6 connections (2 cross connect)
10G with LC assembly	550m	550m	530m
10G with low loss MPO modules	520m	400m	290m
40G/100G with low loss MPO connectors	150m	120m	N/A

Nile University (Egypt)

"Nexans has key technical advantages over the competition."

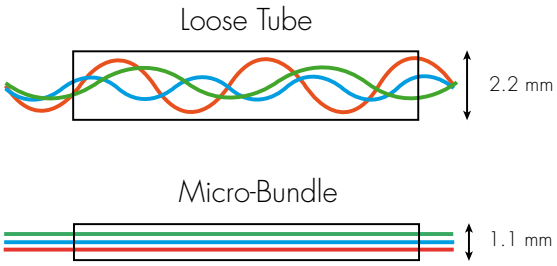
Rami Bechir,
Executive Manager
UBC Integrated Solutions



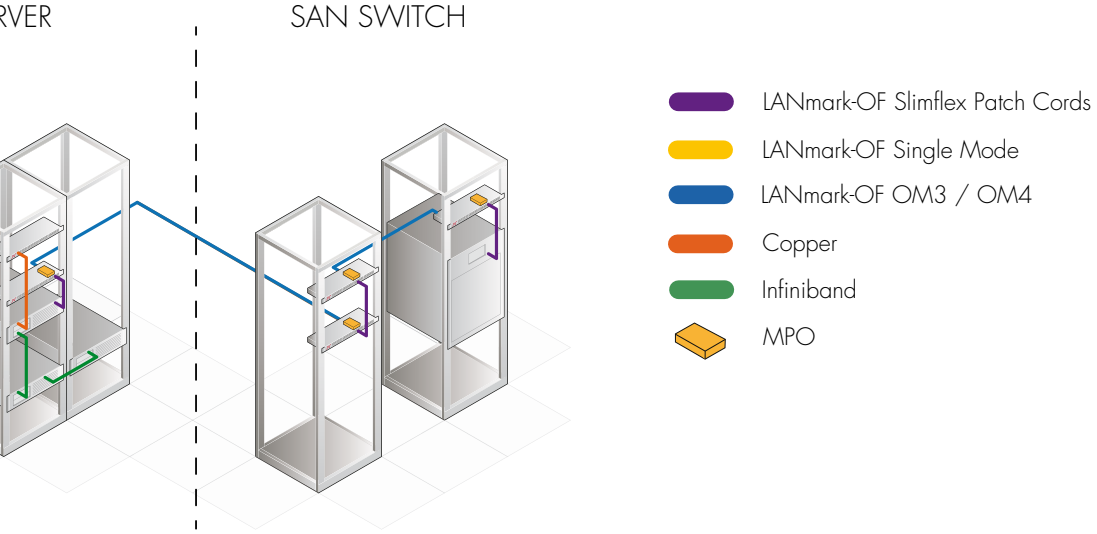
2. Improving airflow and cooling

Flexible, reduced diameter Micro-Bundle cables from Nexans are lightweight and pliable, making them easy to arrange in patch panels versus traditional Loose Tube cables. Their small diameter also reduces the valuable space needed to accommodate each cable, which improves air flow to reduce cooling costs.
Smaller tube and better fibre arrangement leads to better skew of the Micro-Bundles: skew is less than 1 ns for 100 m. This exceeds the 40G/100G standard requirement of 79 ns for 100 m by almost 2 orders of magnitudes. It shows there is no need for ribbon cable for parallel optics, and that round cables are equally good.

- Smaller diameter – less space needed.
- Up to 96 fibre/Micro-Bundle.
- Ease of installation, since it has no preferential bending like traditional ribbon cables.
- Future proof – ready for 40/100G because of better skew.
- Reduced need for expensive Data Centre space and limited airflow disturbance, decreasing operational costs such as cooling.
- Very small bending radius of only 65 mm.



Smaller tube and better fibre arrangement
in Micro-Bundle lead to lower skew



Tangier Free Zone
(Morocco)

"The most efficient operation possible must be ensured. To do this, efficient connection solutions from Nexans were put in place which guarantee minimum signal loss, are easy to install and above all which require less maintenance."

Laurent Delfour,
Technical manager
CIRES TELECOM

LANmark-OF

3. Managing High Density

Bend insensitive cords

Tight bends are common in Data Centres due to large numbers of patch cords for core switches and cross connects. LANmark-OF Slimflex patch cords are a new solution that addresses this challenge.
Slimflex bending radiuses are reduced to 7,5 mm in any direction thanks to special, highly flexible sheathing material and cords being round instead of the traditional zip cord. They also protect the fibre inside and have no special bending preference for optimal flexibility. This minimises issues with tight bends whilst providing a 30% space saving compared to conventional patch cords. Even tightly-packed cabinets appear more orderly.

High density panels

A specially designed angled panel with up to 96 preloaded LC-adaptors allows high density patching. Because of the panel's v-shape in front, patch cords can be guided to the side. No additional patch guide is needed which opens up at least 1 U per panel!

Support tool

High density cabling is necessary in Data Centres. But installation and removal of patch cords in a high density area is a major problem and it becomes more and more difficult to plug or unplug tightly-packed patch cords just with your hands. Nexans now offers a special patch cord removal tool, just to make daily work in a Data Centre a bit more easy.

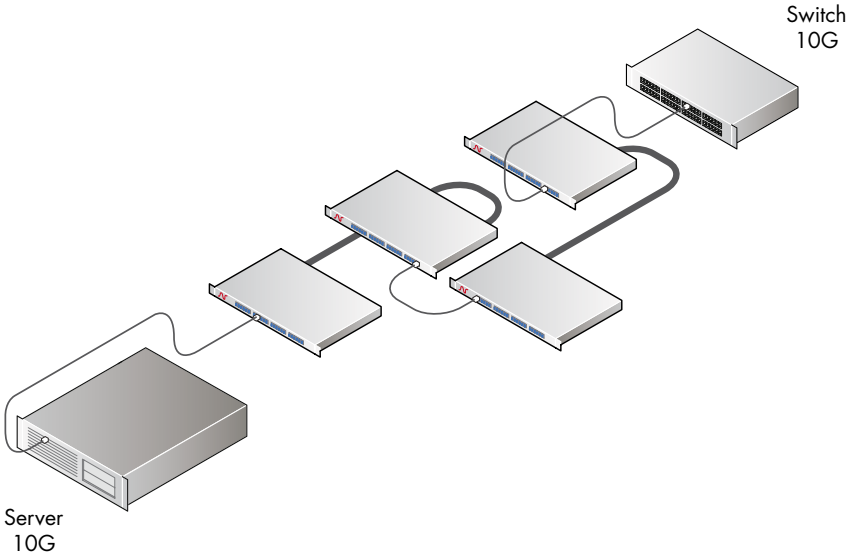
INCHEON Airport
(Korea)

"Nexans is the world's leading company of cable manufacturing industry in the world […] and has earned high reliability through numerous references."

Kim Ki-ho,
Senior Vice President,
ICT, Daesun E&C Co., Ltd.

Install today...

Backbone cabling, Patch Panels,
MPO Modules, LC Duplex Patch Cords



No need to replace / re-install

4. Reduced installation time

Pre-Term terminated by single fibre connectors like LC or multi fibre connectors like MPO accelerate panel-to-panel connections because they are ready for immediate installation and have been pre-tested for reliable performance. Installation time is reduced by 80% compared to conventional termination methods. These assemblies are supported by preloaded patch panels and MPO modules that facilitate a quick and reliable start up of the Data Centre.

5. Consistent patching - removing polarity concerns

Nexans' MPO in an expertly designed Pre-Term solution eliminates the aggravations of traditional polarity methods. Simply pull the preterminated cables between the two racks, install identical cassettes on both sides, and connect to the active devices with the same traditional patch cords on both sides of the channel. No special polarity components, patch cords or installation procedures are required. Nexans' round Micro-Bundle design and advanced wiring scheme in the Pre-Term construction solve operational patching challenges.

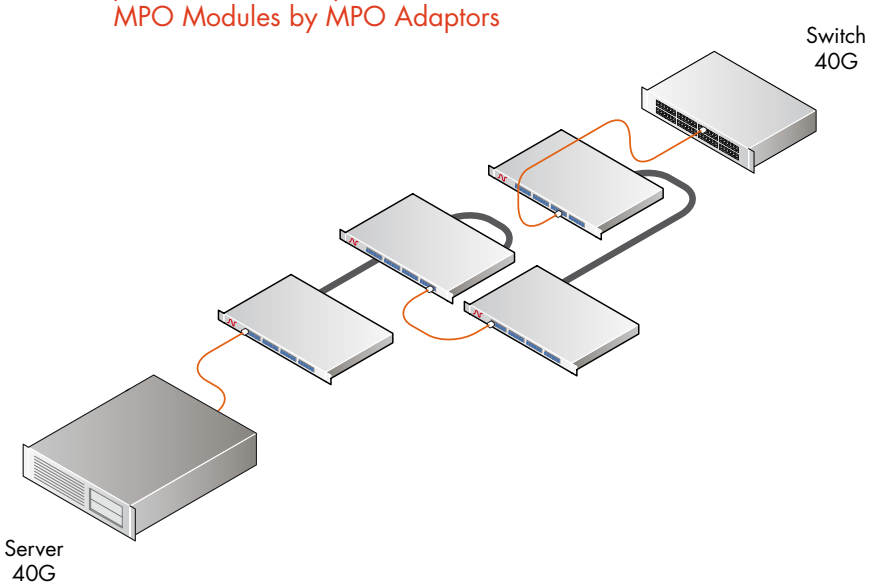
6. Bandwidth migration to 40G and beyond

Today's active components support LC connectivity. But the next generation of switches will feature a new connector already standardised for 40 and 100G transmission – the MPO. Therefore, Data Centre managers must realise that current LC connectivity will not fit in the near future. The Nexans LANmark-OF MPO cabling solution solves this migration problem. By using adaptor cassettes, MPO/LC compatibility with existing LC-hardware and future 40G devices requiring MPO connectivity is achieved.

The MPO connector's advanced design, working with preterminated cables, results in a well-controlled connectivity channel that makes MPO a true plug and play solution.

… migrate tomorrow

Replace only
LC Duplex Patch Cords by MPO Patch Cords,
MPO Modules by MPO Adaptors



panels and OF horizontal cables

Belgacom (Belgium)

"Nexans offers the latest optical fibre technology at the best price."

Jan Rodeyns
IT Project Manager
Belgacom

LANmark-OF

Value worth having...

Adding value to fibre networks is more than supplying high quality products.
Nexans provides a range of tools and services, either directly or in conjunction with business partners, to reinforce an unrivalled service and support package to meet the demands of both installers and end users alike.

Network Design Tools

Nexans' website provides helpful software tools. There are Visio Templates for download that enable users to create fast, professional cabinet layout drawings with enhanced features.
Other software includes the LAN Calculation Toolkit, which assists planning, design and installation of LAN infrastructure. It includes a fibre cable selection function to determine the optimal cable(s) required based on different installation or environmental conditions.

Training

No matter what is your level, Nexans will find the best training program to meet all your needs. The LAN technology evolution requires a wide and varied range of skills. No two projects are the same. We find the synergy between your needs and our programs.
In order to make this "level training" program possible, instruction has been divided into different modules to address diverse topics for specialised professionals such as installers, project managers, designers, consultants, architects or end users.

Online support

E-service is web-based access to data sheets, case studies, certificates and related technical support. With e-service, you can also generate your own customised catalogue.

On site technical support

A team of Nexans technical service specialists provides on site installation consultation, training, engineering drawings or assistance in preparing and presenting Request for Proposal tenders.

Warranty

A parts guarantee is one thing. But what happens when you put them together?
Many companies may be specialised in one area, but what if you have a mixed infrastructure of both copper and fibre? With a Nexans solution, you don't have to worry because we cover the complete cabling system, regardless of transmission medium or building topology.

Reasons to choose Nexans

Expertise

- Worldwide experience
- More than 30 years of fibre cable production
- Extensive R&D expertise and skilled fibre project support team
- Advanced testing methods and practices help guarantee system performance

Future-Ready

- High bandwidth fibre classes available
- Pre-Term solutions for fast Data Centre installations
- Easy migration to 40/100G

Solutions

- One supplier for complete LAN support – fibre, copper and intelligent infrastructure management
- One warranty for all LAN cabling
- Full connectivity based on choice of modular Snap-In concept, MPO or standard pre-installed adaptors
- Secure patch cord locking feature prevents unauthorised disconnection from network

Nexans

About Nexans

With energy as the basis of its development, Nexans, worldwide leading expert in the cable industry, offers an extensive range of cables and cabling systems. The Group is a global player in the infrastructure, industry, building and Local Area Network markets. Nexans addresses a series of market segments: from energy, transport and telecom networks to shipbuilding, oil and gas, nuclear power, automotives, electronics, aeronautics, material handling and automation.

Nexans is a responsible industrial company that regards sustainable development as integral to its global and operational strategy. Continuous innovation in products, solutions and services, employee development and engagement, and the introduction of safe industrial processes with limited environmental impact are among the key initiatives that place Nexans at the core of a sustainable future.

With an industrial presence in 40 countries and commercial activities worldwide, Nexans employs 23,700 people and had sales in 2010 of more than 6 billion euros. Nexans is listed on NYSE Euronext Paris, compartment A. For more information, please consult www.nexans.com or www.nexans.mobi

In the field of LAN Cabling Systems, Nexans Cabling Solutions offer a complete range of products and value added services providing improved reliability and reduced cost of ownership for Network Managers, together with faster installation times for installers.

In addition to LANmark brand cabling systems, Nexans also specialises in LANsense Intelligent Infrastructure Management (IIM) products including Environmental Monitoring and Access Control (EMAC) devices. Nexans offers an unrivalled choice of LAN infrastructure solutions to a global customer based through an extensive network of regional offices and Key Account Management team.

Nexans Cabling Solutions
Alsembergsesteenweg 2, b3 - B-1501 Buizingen
Tel: +32 (0)2 363 38 00 - Fax: +32 (0)2 365 09 99
Nexans Cabling Solutions UK and Intelligent Enterprise Solutions Competence Centre
2 Faraday Office Park - Faraday Road - Basingstoke - Hampshire RG24 8QQ
Tel: +44 (0)1256 486640 - Fax: +44 (0)1256 486650

www.nexans.com/LANsystems - info.ncs@nexans.com

© Nexans Cabling Solutions. All rights reserved. LANmark, LANsense and GG45 are registered trademarks of Nexans. Release date: November 2011.

MIX
Paper from responsible sources
FSC® C008316