Innovation for the Future

Foundational Connectivity Solutions for Next-Gen Networks

Contents

CORNING | GLASSWORKS AI™

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GlassWorks AI™ reimagines the plan-design-deploy process for you to create your customised AI network.

Corning helped create the AI age. We'll help you navigate it. Built to handle even the most complex and highly customised projects, this new service is your one stop for AI network solutions. Our experts will work with you throughout the plan, design, and deploy phases. Together, we'll create a customised, future-ready network that solves your real issues, fits your exact needs, and delivers the density, quick deployment, scalability, and sustainability you need to succeed.

At **GlassWorks AI™,** you'll find:

- Best-in-class network planning, design, and deployment services
- Industry-leading fibre optic connectivity solutions and expert training
- Robust in-house manufacturing capabilities

Backed by an unmatched heritage of world-changing glass science and network innovation, Corning is ushering in today's global AI revolution. Leverage our expertise to capture your share of AI's limitless possibilities.

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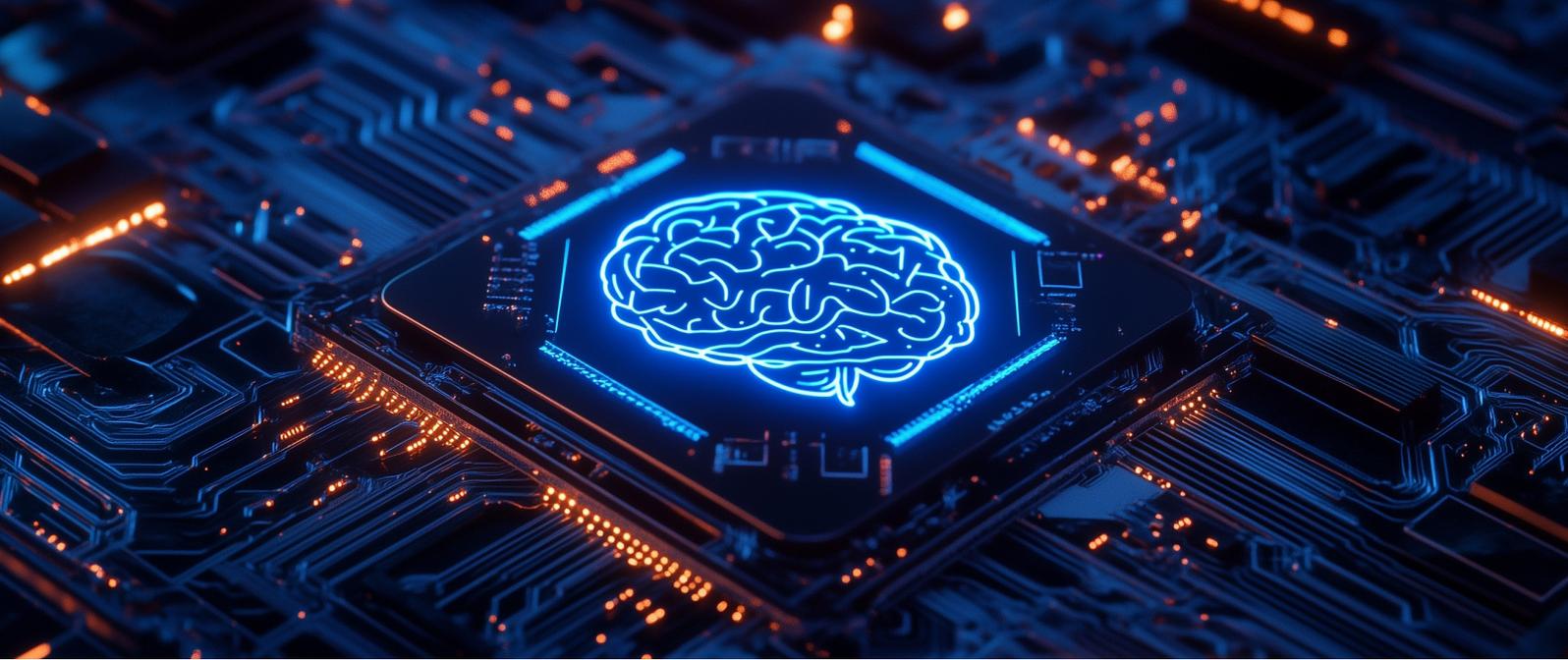
Introduction

The Current Landscape

Connectivity is the backbone of modern infrastructure. The increasing adoption of AI, cloud computing, remote work, and Internet of Things (IoT) is fuelling the demand for high-speed, low-latency networks. Whether in data centres, urban and remote deployments, or enterprise networks (EN), fibre optic connectivity is now a fundamental requirement for businesses, governments, and consumers alike. Organisations planning large-scale fibre rollouts in different scenarios and environments can meet performance and scalability targets more effectively by adopting solutions that streamline network installation.

Traditional network deployment methods often struggle to keep up with these growing demands. The reliance on skilled labour for fibre splicing, time-intensive installation processes, and complex network configurations lead to deployment bottlenecks. This has resulted in a search for faster, more scalable solutions that can simplify network installations while maintaining reliability and performance.

Governments worldwide are prioritising broadband expansion to bridge the digital divide. The need for high-capacity, flexible networks is driving the adoption of Fibre to the Edge (FTTE) architecture, while the rise of generative AI is creating yet additional demand. Public and private infrastructure initiatives responding to broadband funding and AI-driven demand can secure faster project timelines and long-term efficiency by prioritising scalable fibre architectures such as FTTE. Together, these developments are intensifying the demand for rapid, reliable deployment strategies. As a result, innovations like pre-connectorised fibre solutions are becoming critical in meeting today's infrastructure challenges while ensuring future network scalability.

What Are Pre-Connectorised Solutions?

Pre-connectorised solutions refer to fibre optic cables and components that come pre-terminated and pre-tested in a controlled environment, eliminating the need for field splicing. These plug-and-play solutions reduce installation time, lower dependency on skilled labour, and enhance network reliability by minimising errors that occur in manual fibre splicing.

Traditional fibre deployment requires extensive on-site labour, where each fibre strand must be precisely spliced and tested before being deployed. This process is not only time-consuming but also prone to errors, requiring highly skilled technicians. Pre-connectorised solutions address these issues by providing factory-assembled, high-performance connectivity that can be installed rapidly with minimal technical expertise.

Key benefits of pre-connectorised solutions include:

Faster Deployment

Installation time can be reduced significantly compared to traditional methods, according to internal research conducted by Corning.

Lower Costs

Minimises labour expenses and installation overheads.

Future-Proof Infrastructure

Easily scalable to accommodate network expansions.

Enhanced Reliability

Factory-terminated connections are more consistent and less prone to faults.

Maintenance and Repair

Replace the drop cable by simply unplugging the old one and plugging in the new one. This process requires no special training and enables faster maintenance responses.

From data centres to fibre-to-the-home (FTTH) deployments and enterprise networks, pre-connectorised solutions are reshaping the way fibre optic networks are built, enabling operators to deploy high-performance infrastructures quickly and efficiently. Network operators aiming to accelerate rollout timelines and reduce installation risks can gain significant advantages by incorporating pre-connectorised systems into their deployment strategies.

What to Expect in this Guide

This guide explores the transformative impact of pre-connectorised solutions across various network applications. By examining industry challenges, innovative technology benefits, and real-world use cases, we'll provide a comprehensive guide to understanding how pre-connectorised solutions can accelerate deployments and optimise network performance.

In the following chapters, we will:

- **Analyse key challenges** faced in modern network deployments, including labour shortages, complex installations, and the need for rapid scalability.

- **Introduce Corning's Four S Model**, a framework that emphasises Speed, Space Optimisation, Simplicity, and Sustainability in fibre network solutions.

- **Showcase industry innovations** that are shaping the future of fibre optic connectivity, from AI-driven data centres to nationwide broadband expansion initiatives.

- **Provide down-to-earth best practices and checklists** for organisations considering pre-connectorised deployments, ensuring seamless implementation and long-term reliability.

By the end of this guide, readers will gain a clear understanding of how pre-connectorised solutions can help overcome modern connectivity challenges and set the stage for a scalable, efficient, and future-ready network infrastructure. Technical decision-makers seeking to modernise fibre infrastructure can use the following chapters to evaluate strategic approaches for faster, more reliable, and future-ready deployments.

The Challenge

Cable Industry at a Turning Point: Key Challenges and the Future of Fibre

Did you know that the average Western European household hosted an average of 9.4 devices in 2023? According to **Statista**, that number has more than doubled since 2018. Homes are filled with devices – computers, smartphones, smartwatches, televisions, and tablets – that are continuously connected, each **demanding bandwidth**. This surge in connected devices has driven the cable industry to rapidly upgrade networks to reliably deliver the ever-growing stream of data demanded by consumers. To meet these needs, providers are replacing legacy copper cabling with optical fibre and adopting **Fibre to the Edge (FTTE) architecture** to deliver reliable, high-speed connectivity directly to the network edge where devices are located.

Just two decades ago, the concept of providing individual homes and businesses with fibre optic connections was groundbreaking. Today, that vision has become a reality. Fibre was once primarily used for long-haul networks or connecting to nodes. Now, the focus is on helping customers deploy fibre directly to the home, where they can choose a 1, 10, or even up to 50 gig symmetrical service.

Cable Industry Challenges

In recent years, there has been a rush to upgrade networks to meet growing customer demand. Many providers are focusing on building networks with 10 gig fibre, with most areas now being equipped with fibre infrastructure. The reason for this shift is clear. Optical fibre offers numerous advantages over traditional copper cables, including nearly unlimited bandwidth, greater durability, and a higher degree of future-readiness. Corning has played a key role in making fibre deployment easier and more cost-effective, helping providers keep pace with the increasing demand for faster, more reliable connectivity.

Three major challenges have emerged for network operators: the demand for quick and cost-effective deployment, a shortage of skilled labour to complete the work, and the struggle to integrate additional high-speed data lines into existing infrastructure. In certain countries like Germany, the **highly decentralised regulatory frameworks and complex approval procedures** may present an additional challenge.

Smart Solutions for FTTH Network Deployment

Laying out vital infrastructure is no easy task, and getting it right is crucial. However, anything that unnecessarily slows down network deployment can ultimately result in higher costs. From civil permitting delays to the complexity of laying hundreds, if not thousands, of metres of cable, every slowdown adds up. Pre-connectorised solutions, like the Corning Evolv® portfolio and **Multifibre Pushlok®**, connectors are accelerating deployment compared to legacy solutions, with less risk of error. Testing has shown these types of installations can be up to 5x times faster than traditional installations and field splicing.

Passive fibre optic networks to the home typically have lower operating costs compared to hybrid fibre coax (HFC)-based networks, with lower power consumption and reduced maintenance. HFC networks have served the industry well for decades but come with maintenance challenges, such as corrosion and costly equipment upgrades to meet increasing bandwidth demands. However, Corning's **hardened connectivity solutions** protect against common environmental factors like extreme temperatures, moisture, humidity, and other harsh conditions. These solutions have already enabled fibre connectivity to **more than 100 million homes globally**. Fibre's fully passive nature also ensures networks are prepared for the future, requiring upgrades only at each end of the network, not in the middle.

Labour Constraints

Building FTTH networks requires a highly trained workforce, which is currently in short supply. In Germany alone, **there could be a shortage of around 663,000 IT specialists by 2040**. This labour shortage poses a threat to the timely deployment of broadband infrastructure, potentially leading to significant delays in meeting deployment targets. If not addressed, the shortage could result in delays of 18 months or longer due to the lack of technicians available for fibre installations.

Network operators report the need to work faster to meet growing customer demand. To address this, Corning not only develops innovative solutions to accelerate deployment but also supports the fibre optic workforce in gaining essential skills through ongoing training and workshops. As a result, technicians, installers, and network specialists have gained the knowledge and experience needed to design, engineer, install, and manage expanding fibre broadband networks. Corning experts have not only taken part in training programmes but have also mentored other instructors using a "**train the trainer**" model, helping to expand the programme's reach and impact.

Another solution to the labour challenge is creating a collaborative ecosystem. Corning's participation in various industry associations in the different business segments is a critical element in addressing the labour shortage. These partnerships are vital for securing skilled workers, promoting workforce education, and driving fibre optic expansion worldwide. Among the prominent associations Corning collaborates with are **InfraNum**, **Bundesverband Breitbandkommunikation e.V. (BREKO)**, **FTTH Council Europe**, **Fibre Connect Council MENA**, **EuropaCable**, and Data Centre Associations in Poland, Germany, Italy, and France, among others.

Network Density

While bandwidth demand has grown, the space available for network infrastructure has not. As developers often choose fibre for greenfield builds, deploying fibre in existing spaces presents its own challenges. Installers are constantly looking for ways to reduce installation complexity and provide a denser network of cables within existing structures and ducts. The limited availability of physical space for upgrades makes it harder to meet the growing demands of generative AI. Artificial intelligence now demands more than what a single data centre can provide, driving the growth and demand for fibre between interconnected data centres. **Corning® GlassWorks AI™**, a new customised portfolio for AI data centres, offers comprehensive solutions for various types of **Data Centre Interconnect (DCI)** deployments including Rack-to-Rack Interconnect, Multi-Rack Interconnect, Campus Interconnect, and Long-Haul Interconnect.

In addressing today's needs, it's equally crucial to plan for tomorrow's challenges, which is precisely where Corning's next-generation, fibre-dense cable creates cutting-edge opportunities. The cable, **recently highlighted in a major announcement with Lumen**, will offer significantly more capacity to major cloud data centres. In general, each strand of optical fibre is roughly the size of a single human hair and can transfer data at up to 150 terabits per second. Corning® SMF-28® Contour optical fibre enables cables that are both more densely packed with fibre and smaller in diameter, making them easier to run through ducts. By leveraging Corning's optical fibre cable design innovations, operators can quickly install more capacity in the same duct space to accommodate increased connections and bandwidth demand.
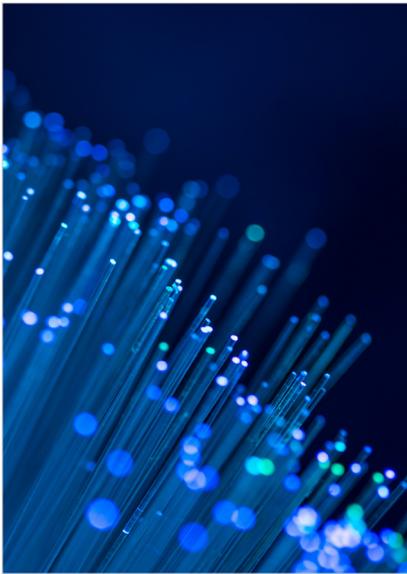
The Future Is Fibre

As the future unfolds, the cable industry anticipates an even larger surge in demand for AI. Cable companies with powered active devices near the edge of the network are well-positioned to capitalise on AI inferencing – moving machine learning data between the cloud and the edge. As a leader in fibre optics and AI connectivity, Corning is prepared to support cable customers in taking advantage of this emerging trend.

As the cable industry continues to adapt its networks to growing broadband demands and reliability needs, fibre is the clear choice for future builds. Once deployed, it can be trusted to outpace consumer demand for decades to come. With an innovative mindset, leadership in materials science, cutting-edge manufacturing processes, and deep industry expertise, Corning aims to support customers in finding new ways to reduce deployment barriers and install fibre networks faster, more cost-effectively, and more efficiently than ever – while also developing products that address the industry's complex challenges.

Challenges in Data Centres, Fibre to the Premises, and Enterprise Networks

Rising demand for faster connection speeds and greater reliability in **Data Centres (DC)**, **Fibre to the Premise (FTTP)**, and **Enterprise Networks (EN)** presents several challenges. Limited resources and complex installation processes make traditional deployments time-consuming and labour-intensive. Pre-connectorised solutions offer a faster, scalable alternative for meeting these needs and ensuring efficient deployment.
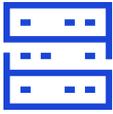
Data Centres and AI Growth

The rapid growth of AI and GenAI is driving demand for **hyperscale data centres** capable of managing the vast data required for Large Language Models (LLMs). Operators face challenges of scale and density in meeting the infrastructure requirements of AI, both inside the data centre and in the long-haul networks that connect them.

Cutting-edge innovations, like the **Corning GlassWorks AI™ portfolio**, can meet these needs with a wide array of technologies. **Corning Configured Racks (CCR)**, one of the portfolio's flagship solutions, drives efficiency and **sustainability** at every step – from design to deployment. Assembled and preloaded in a controlled factory environment, Configured Racks enable up to 12x faster installation. Their streamlined logistics – a single truckload delivers up to 24 fully built racks – can reduce packaging waste by up to 500 kg and cut CO_2 emissions by as much as half a tonne when compared to packaging each component individually. Another new solution from the GlassWorks AI™ portfolio, the **Contour™ Flow Cable**, accelerates and simplifies deployments of interconnected data centre networks by fitting double the fibre into existing cable diameters. As a result, it enables the foundation for high-density optical infrastructure needed for large graphical processing unit (GPU) clusters.

FTTP Deployment Pressure

Governments worldwide are pushing for faster FTTP expansion, placing significant pressure on network operators to accelerate rollouts. Scaling infrastructure quickly is a challenge due to skilled labour shortages and time-consuming fibre splicing.

Pre-connectorised fibre solutions, such as **Evolv® terminals and drops with Pushlok® Technology**, can effectively address these challenges by reducing deployment time and reliance on workforce resources. This helps operators meet public targets faster while staying competitive in the race to deploy full-fibre networks, ensuring they keep pace with industry leaders.

Enterprise Network Demands

Managing local area networks (LAN) for in-building applications – such as cellular, Wi-Fi, Building Management Systems (BMS), security, and other IP-based services – is becoming increasingly challenging. Enterprise networks are struggling to keep up with the growing demand for bandwidth, as **80% of mobile data traffic is generated indoors**.

Historically, bandwidth expansion has been reactive, but with the rapid advancements in AI, **5G**, and IoT, faster action is essential. Pre-connectorised products, like the **Corning® Everon® Network Solution**, are designed to reduce the time and effort organisations dedicate to their infrastructure. A range of Everon® Enterprise Network Solutions is available to accommodate various building sizes and customer requirements. Whether a **LAN** application is in a small medical clinic, a multiterminal airport, or an extensive campus with multiple buildings, all components of the solution are proven to work seamlessly together.

In addition to performance and efficiency, sustainability has become a key priority in network design. A Whole Building Life Cycle Assessment (WBLCA) of a building-wide network at Corning's HQ showed that, in comparison to legacy copper cabling, a **Fibre to the Edge architecture** results in a 6.8% reduction in whole-building life cycle carbon over a 30-year period. Optical fibre can significantly lower embodied carbon – the emissions associated with raw material extraction, manufacturing, delivery, and construction methods. By using fewer, considerably more compact cables and streamlining installation, fibre networks help minimise embodied carbon, supporting emission reduction goals without compromising performance.

Data Centres Today: Navigating the AI Revolution

Data centres are now essential for the smooth functioning of daily life, powering everything from IT infrastructure and web content to banking and more. The surge in artificial intelligence (AI) and machine learning (ML) applications, both in civilian and enterprise sectors, has underscored the vital role data centres play in enabling transformative use cases.

As AI and other data-intensive applications continue to grow rapidly, the demand for dense, efficient, scalable, and cutting-edge data centre practices has surged. Three key trends are driving the transformation of modern data centres.

1 Design to Deployment: Space Optimisation Will Remain Critical for Hyperscalers

After years of preparation, the data centre industry has entered a **phase of large scale AI deployment**. **Hyperscalers** are now transitioning from planning and design to implementation, activating and expanding the back-end network infrastructure essential for supporting AI technologies.

Generative AI-enabled data centres currently require more than ten times the amount of optical fibre compared to traditional data centre networks. This evolving back-end network demands increased deployment of GPU clusters and fibre-rich interconnects to accommodate more complex, data-intensive computations.

To support that volume, data centres will need to leverage fibres with low attenuation and exceptional bend performance, helping to manage cable congestion, particularly where they're retrofitting an existing facility rather than building net new. As networks evolve, operators will need to leverage smaller, bendable fibre, like **Corning® SMF-28® Contour optical fibre**, to optimise the optical footprint within the server rack space.

2 Deployment Speed and Scalability: The Race to Adapt

Two of the biggest challenges data centre operators will continue to face are speed of deployment and network scalability. Many organisations are seeking ways to adapt their networks for long-term growth and have developed multi-year plans to meet increasing computing demands. As technology evolves rapidly, network componentry must be quickly adapted to keep pace. Pre-connectorised cabling solutions, such as **Corning's distribution system** and cables terminated with **MMC connectors**, enable operators to deploy fibre-dense solutions using a "plug-and-play" approach, where components come pre-assembled and tested, allowing fast installation with minimal on-site work. This significantly accelerates deployment speed compared to traditional cabling methods.

Another challenge posed by a rapid buildout is that all data centre operators have their own unique plans on how they'll scale over time. For those that plan to increase data processing capabilities within their data centre, having a structured cabling system that can support multiple generations of optical transceivers is essential.

Fibre strand and cabling flexibility is also essential to space optimisation and processing large amounts of data. It provides better attenuation control and the ability to connect buildings over large networks.

As organisations race to build the infrastructure to support today's computing needs, high-fibre-count cables with exceptional bend performance, along with plug-and-play solutions, will continue to emerge as top choices.

3 Interconnected Data Centres and Long-Haul Connectivity Will Fuel the Future of AI

Today, network operators are expected to continue expanding AI data centres and interconnecting more data centre networks to meet the growing demands of AI. **Long-haul connectivity** will be critical in enabling interconnected networks and helping operators overcome power and land constraints.

Interconnected data centres, as referenced in the recent **Corning Incorporated and Lumen Technologies** supply agreement announcement, provide operators with the ability to transmit vast amounts of data over extended distances, effectively addressing limitations imposed by geographical constraints. By leveraging long-haul fibre solutions, data centre operators can establish campuses in unconventional locations, accessing the necessary resources while increasing network density.

As AI infrastructure continues to scale, new fibre solutions, practices, and network architectures are emerging to meet growing demand.

Pre-Terminated Solutions: Ready for the Data Centre Challenge

It is no secret that bandwidth demand is skyrocketing as our world becomes increasingly connected and data-intensive applications, like artificial intelligence, continue to grow in maturity. In response, the data centre industry has had to adapt and expand. Today's data centres must be capable of storing and managing massive amounts of information, while remaining reliable and flexible to support customer needs 24/7 – and they must be up and running as quickly as possible.

The types of data centres we see today range in scale from small edge and private enterprise data centres to multitenant and hyperscale campuses. Data centre interconnect applications have emerged as an important and fast-growing segment to support large-scale deployments – often involving over 10,000 fibres connecting large data halls across a campus.

The traditional approach in the outside plant environment is to splice these fibres. With fibre counts of 1,728 and 3,456 (or even higher), it can take weeks to perform the necessary preparation, connect these fibres, and bring them inside the building. Compounding this challenge, the industry across Europe is also facing a shortage of skilled workers. Even with a skilled labour force, extensive splicing can be challenging, and it is very easy to misalign a splice or splice the wrong ribbon.

When it comes to large-scale data centre projects, time is money, and operators know they cannot afford delays in network installation that hinder their ability to meet the ever-increasing demand for bandwidth. How can operators solve this?

The Case for Plug-and-Play

One of the most effective approaches is to explore pre-terminated solutions, which eliminate the need for field splicing entirely. Rigorous testing of the cabling can be done off-site, in a controlled environment, and the complete package can then be shipped to the job site for installation into a variety of pathways and spaces.

Both vertical and horizontal cable management can be addressed and simplified using pre-connected cable systems for trunks, cable assemblies, and connector modules, often referred to as "plug-and-play" systems. Since cables aren't spliced onsite, the time spent by installation engineers is reduced, leading to instant cost savings. A simpler and easier process also means fewer chances for mistakes and less dependency on skilled labour.

When new-build construction schedules overrun – as they commonly do – and other unpredictable elements, such as adverse weather or shortages in raw materials, dramatically shorten the project timelines, the rapid installation offered by pre-terminated cabling is invaluable. It could be the one critical component that helps ensure the overall project is completed on time.

The scalability of pre-terminated systems is also important in supporting cabling projects as they mature. As a data centre grows or develops, being able to take a blueprint and recreate a project multiple times provides a cost-effective solution to increasing demands.

What's the Catch?

When it comes to pre-terminated performance, the expectation may be that link quality is compromised, but today's pre-terminated solutions offer quality that meets or exceeds cabling standards on the network link insertion loss when compared to spliced solutions.

There is, however, a deeper requirement for a more detailed planning phase that pays close attention to the data centre environment and floor plan. Adjusting on the fly will be more difficult when the splicing has already taken place in the factory.

Another thing to consider is fibre polarity across the network, which is a topic that has provided headaches in many installation projects. This became more critical with the introduction of the multifibre push-on connector (MPO) in the 1990s, as different vendor systems use different polarity methods (Type-A, B, or C), all defined within the ANSI/TIA-568-B.1 standard.

The challenge with existing infrastructures is to make sure legacy installed products and new additions operate correctly with matching polarity. Plug-and-play solutions utilising universal polarity can bring relief for customers to always have the correct polarity in the network link.

What to Look out for when Sourcing a Pre-Terminated Solution

When using pre-terminated solutions, one important task facing contractors is to ensure the cable length measurements are correct. Given that the pre-connectorised trunk cables and harnesses are primarily made to order, this can easily be resolved with universal polarity components. Working with solution providers that offer additional support services to help ensure accuracy and complete peace of mind is also beneficial.

Pre-terminated cabling plays a key role in overcoming density challenges by supporting the advancement of high-fibre-count assemblies, both with small-size duplex or multifibre connectors. Structured cabling systems can be bundled and pre-terminated at the factory, which can allow for more tightly packed fibres to be installed into trunks and help manage for future growth with superior fibre access, while providing high-quality, pre-polished, ready-to-install products.

Some manufacturers can even provide pre-terminated solutions that enable the disaggregation of high-speed parallel optic ports (40G to 800G) into lower-speed ports servicing the end-devices through harnesses or port breakout modules. This provides significant density advantages both in terms of the attached electronics, and therefore costs, as well as the housings in the wiring areas along with savings in power and cooling.

There is one final consideration. For large orders and some locations, pre-terminated cabling can result in longer initial lead times. To shorten transportation times, a specific focus on diversified and local manufacturing availability within target regions can be vital for bringing lead times down from weeks to days.

Advanced developments in pre-terminated cabling solutions are making it faster and easier for data centre managers and their installers to reliably perform important cabling tasks. Considering the growth of data centres in numbers and size and the additional benefits – including cost savings and a reduction in wastage – pre-terminated systems are an increasingly attractive proposition for installers.

Go Farther, Faster with Long-Reach Solutions

Providing Connectivity at the Edge

In today's world, campus-wide security cameras, blanket Wi-Fi, and perimeter access control prove essential for colleges and universities — but enabling these seemingly simple devices across a campus is often quite complex. These technologies often test the 100-metre distance limitation of copper cable networks, leading to maxed-out pathways, space constraints, and costly local power outlets. Fortunately, Corning's long-reach solutions can provide the cost-effective, "set it and forget it" connectivity you need at the edge.

Corning's Long-Reach Network Architecture Key Components:

- Long-reach flexible cable infrastructure
- Intelligent remote power solutions
- Connectivity at the edge

Corning's long-reach solutions offer cost-effective, reliable, and scalable connectivity that can enable the deployment of complex technologies across campuses. We offer a streamlined architecture that can adapt to future needs and grow with educational institutions.

Contact us today to learn more about how our long-reach solutions can benefit your campus.

Learn more

The Solution

Corning's Four S Model

As data centres expand to meet the growing demands of cloud services, AI, and machine learning, speed, adaptability, and energy efficiency are more crucial than ever. The industry is currently experiencing a significant moment of opportunity across all segments of the network. Public and private investments in broadband are growing, working toward the goal of connecting the unconnected. Data centres are expanding to meet the rising demand for information processing in the cloud, as AI and machine learning continue to transform various industries. In enterprise networks, seamless connectivity is becoming increasingly critical in a wide range of environments, from healthcare to hospitality to offices.

Corning's **Four S Model** – Speed, Space, Simplicity, and Sustainability – addresses key industry challenges, including labour shortages, rapid deployments, ease of use, and environmental responsibility. Pre-connectorised solutions are a direct application of this model, ensuring networks can scale efficiently while reducing complexity.

Speed: Outpacing Demand

From broadband networks to the data centre, operators must build faster to stay ahead of surging bandwidth demand and meet the required timelines for government-supported projects. Corning has, for decades, focused innovation on helping customers deploy on-time and on-budget networks. For instance, Pushlok® connectors, part of the Evolv® portfolio, are designed for efficient and reliable installation with minimal effort.

This is just the latest in a long history of innovations that accelerate the deployment of fibre broadband networks. Nearly 20 years ago, Corning pioneered the first pre-connectorised solutions for fibre to the home. What made these solutions revolutionary was their labour efficiency. They eliminated splicing in the field. Recently, Corning's pre-connectorised solutions reached a significant milestone, officially connecting more than 100 million homes around the world.

Space: Enhancing Efficiency

As bandwidth demand grows, physical space for infrastructure is becoming increasingly limited. To optimise available space in server racks and cable pathways, operators must prioritise compact, high-density fibre optic solutions. By using smaller, more efficient components, networks can scale without requiring additional real estate.

The introduction of Corning® **SMF-28® Contour fibre** in a compact, 190-micron version exemplifies this approach, enabling smaller cables with higher fibre counts to optimise existing infrastructure. To further support data centre operators, Corning developed the Corning® MiniXtend® cable with **Flow 200 Ribbon Technology**, which features flexible ribbon cables and fibre counts up to 864, enabling greater fibre density in limited duct spaces. Additionally, Corning **Evolv® Hardened Connectivity Solutions with Pushlok® Technology** cater to the increasing need for deploying fibre in tight spaces, offering a smaller size that reduces costs, accelerates deployments, and meets the growing demand for high-speed connectivity.

Hyperscale operators are also exploring new **Very Small Form Factor Connectors** to allow for port breakout at 400G, 800G, and beyond. What makes VSFF connectors like MDC, SN, or MMC special is that they provide 3x the density compared to traditional LC Duplex and MTP/MPO connectors. VSFF connectors have multiple fibres but provide better density for infrastructure cabling systems and faster deployment speed. Corning is deeply embedded with the world's largest hyperscale AI-enabling data centres, working hand in hand to develop innovations for the future. Designed by US Conec and integrated into our custom Corning solutions, the **MMC** is a compact connector (16F and 24F) designed to help data centres quickly expand to accommodate high-bandwidth AI applications.

Simplicity: Faster Deployment, Safer Installations

The plug-and-play nature of pre-connectorised solutions streamlines installation, reducing deployment complexity and the potential for errors. Pre-engineered cabling solutions enhance efficiency from backbone infrastructure to server racks, enabling rapid capacity expansion with minimal disruption. By consolidating multiple patch cords into a single assembly, operators reduce labour costs while improving safety, eliminating the accident risks associated with traditional, high-elevation installations.

Building on the simplicity concept, Corning has introduced the **EDGE™ Distribution System** for data centres, which streamlines cabling deployment right up to server racks. This system enables operators to swiftly **add capacity** by consolidating multiple patch cords into a single cable assembly. Additionally, it enhances safety, as upgrading cabling within data centres often involves technicians working on ladders above rows of servers. By utilising a single-cable assembly, the EDGE™ Distribution System allows for quicker, more efficient installations, **reducing labour costs** and providing **up to a 55% reduction in carbon footprint** by minimising materials and packaging.

Sustainability: Leveraging Our Best-in-the-World Capabilities, Corning's Businesses Evolve with the World's Needs.

Invention has been at Corning's core for over 170 years. The 1970 breakthrough invention of low-loss optical fibre helped unleash a communications revolution that continues to change the world today. Dedicated investment in the company's research and development drives continuous innovation that has the potential to make meaningful improvements for humans and the environment. Corning doesn't have all the answers, but it does have a crucial tool at the centre of everything the company does, the ability to invent. And not just to invent, but to truly use Corning's capabilities to impact the industries it leads. What we do today will determine how our world looks tomorrow and beyond. In Corning's long-term vision, people are healthier, better informed and more richly connected with one another.

Therefore, **sustainability** is an integral part of the company's work process and a key consideration in modern network development.

Design for Sustainability

Aspiring toward a low-cost and circular economy, Corning continuously seeks opportunities to integrate sustainability into its innovation and development processes. Its goal, where feasible, is to create products and packaging that utilise fewer raw materials and incorporate more recycled, recyclable, and bio-based materials. Its efforts focus on developing products that require less water and energy to produce, while maintaining high standards of quality, performance, and appearance. The company also explores possibilities for return and reuse at the end of a product's life cycle. To better understand the greenhouse gas (GHG) impact of its products, Corning utilises life-cycle assessments in compliance with ISO 14040 and 14044 standards. These assessments inform early-stage design decisions and drive improvements in product redesign. It reinforced its commitment to transparency by publishing its first environmental product declarations (EPDs), solidifying its work in life-cycle assessments.

By investing in sustainable solutions, Corning fosters a shared commitment to reducing environmental impact across the industry. Achieving universal connectivity requires continuous innovation across all network layers, and one good example are data centres. By integrating advanced engineering, Corning ensures its solutions support evolving technological needs while upholding a commitment to sustainability and efficiency.

In product development, **sustainability is integrated into Corning's processes**, as exemplified by the evolution of its products. Corning is committed to keeping the world connected in the most sustainable way. Compared to copper, optical fibre can lower carbon footprint by **at least 85,000 times** when considering the same transmission capacity over the same reach. Compared to one copper pair, a strand of optical fibre delivers increased bandwidth with up to **84% lower carbon footprint** and up to **54% lower power consumption**.

But it doesn't stop there. Corning is continually developing higher-density options for its customers to transmit more data with a lower environmental impact and improving its manufacturing processes to further reduce its impacts. By embedding sustainability considerations into its entire operations, Corning can manufacture smaller, denser, and lighter cable designs with more efficient use of materials, packaging, and transportation, resulting in a lower carbon footprint across multiple cable types, such as SMF-28® Contour optical fibre and MiniXtend® cable with Flow Ribbon Technology.

Corning thinks about its sustainability approach in two categories: the footprint – how the company treats people and what is its own impact on the environment, and the handprint – what the company enables others to do through its products and services.

Corning has an impactful handprint and delivers value in many ways: life-changing innovations brought to market; products that enable its customers to be more sustainable; high-paying, rewarding jobs that span generations; partnerships that strengthen the resilience of its communities; and high-quality financial returns.

Addressing Labour Shortages in Rural FTTP Deployment

Over the last decade, the internet has grown from a convenient tool to a near necessity for modern life – a fact made abundantly clear during the height of the COVID-19 pandemic. Access to broadband means access to opportunity, from education to health care to quality of life. Still, the digital divide persists. **The 2025 report from the FTTH Council Europe** shows that by September 2024, 63.6% of rural inhabitants in Europe could enjoy the capabilities offered by full-fibre connectivity. However, in some European countries, FTTH/B coverage in non-dense areas still remains below 30%.

Thanks to government initiatives like the **Project Gigabit** in the U.K., Germany's **Gigabitstrategie der Bundesregierung**, or the French **Plan France Très Haut Débit**, which allocate billions for broadband deployment, there is greater opportunity than ever before to connect the unconnected. Nevertheless, the process of bringing high-speed internet to more remote areas remains challenging.

One reason for this is a shortage of specialised labour. The deficit is particularly evident in rural regions, where engineers and trained splicers typically must travel significant distances to job sites, making it harder to attract workers and compounding the time required to build out much-needed infrastructure. Even when labour is available, the protracted timelines of rural fibre installation can easily result in budget overruns.

Time Is Money

With traditional fibre optic cables, the process of connecting homes **in rural areas takes a lot of time**. Whereas crews can connect a development of 300 suburban homes with as little as 5 km of cable, the same 300 homes in a rural setting will often require as much as 40 km of cable. But the added material expense is only the tip of the iceberg for these projects. The real bulk of their hefty cost lies in the extensive, specialised labour required to assemble the cabling from multiple reels of fibre.

First, a team of linemen will have to drive to the site and spend hours running the fibre between poles or in the ground. Next, fibre splicers – a job that requires significant technical training – will need to open the cables, splice them together, and test the connection. With such a protracted process, it's no wonder that rural service providers have had such a difficult time finding the labour to build out their fibre-to-the-home networks.

Planning Ahead

With pre-connectorised fibre solutions like Corning's **Evolv®** portfolio, broadband can be delivered to rural areas in **far less time and without nearly as much specialised labour**. Using precision-manufactured connectors, deployments require fewer splice events along the cable path and a reduction in total splices than traditional field deployments, dramatically cutting down the time and cost of extending cabling long distances to remote locations.

Corning Evolv terminals, unlike conventional terminals, do not need to be opened by a technician for maintenance or to add additional drops, so there is less chance of damage from human error. All Evolv terminals incorporate Corning **Pushlok® Technology**. At half the size of traditional hardened connectors, Pushlok® connectors enable **simpler, faster, and more flexible deployments**. Installers can run lines to drop points with far greater speed and minimal tooling.

It is important to note that fibre deployments using pre-connectorised solutions require greater upfront architectural planning than designs using typical field splicing. This planning phase involves collecting span measurements of the infrastructure pathway and locations of homes along the cable run to determine the proper terminal placement and size. AI tools have made the planning process much easier and will help overcome these challenges. However, once the design is complete, the process of carrying out the fibre deployment can be up to five times faster per access point than solutions built on traditional cabling.

Bringing Fibre to the People

Access to affordable and reliable high-speed broadband is vital to a community's economic development and competitiveness. Over the years, private-sector investments have significantly expanded broadband access all around the world, yet many communities remain underserved. Corning believes that everyone ought to have access to high-speed broadband because of the benefits it brings. For the past 20 years, Corning has been helping network operators reach this goal with a line of pre-terminated solutions designed to speed up the process of connecting homes, moving complicated splicing tasks from the field into the factory, thereby requiring less technical expertise to carry out the installation. In collaboration with partners, Corning has helped connect the unconnected in some of the most remote rural areas worldwide, such as **the village of Buheesi in Uganda** and **La Réunion island**.

Bridging the digital divide and delivering connectivity to rural communities is a critical step in building a more equitable future. With innovative products to ease the labour burden and elevate the economic viability of these projects, Corning is bringing the vision of broadband for all closer to reality.

Navigating the AI Landscape

AI requires more than 10x additional fibre than traditional data centres – and more fibre means more interconnects and cabling. A typical AI data centre holds tens of thousands of graphics processing units (GPUs), which are essential for their parallel processing ability, performing massive amounts of complex calculations simultaneously. That means the cabling and equipment distribution area connections will look quite different from a traditional data centre.

This is new territory for many data centre operators, but it represents a tremendous opportunity to serve a growing demand for AI tools and AI-as-a-service applications. As next-generation hardware solutions become more broadly available, there are more opportunities for new players to tap into the AI space.

Why Structured Cabling?

As technology continues to evolve in the age of AI, next-generation, tailored connectivity solutions that can be quickly manufactured and innovated are more essential than ever. Attempting to connect 10,000 GPUs with individual patch cords is messy and time-consuming. Structured cabling fills this critical gap, especially as data centres begin moving from 400G to 800G networks.

Structured cabling is a well-planned, standardised system of organising and connecting cabling infrastructure that's designed to adapt to changing technology needs while maintaining reliable connectivity across various devices and systems within a facility. These strategies are necessary for deploying high-performance AI/Machine Learning (ML) computing clusters, particularly those utilising NVIDIA's DGX systems and InfiniBand™ technologies. **Corning's guide** outlines detailed strategies for all scenarios, including server-to-leaf, leaf-to-spine, and spine-to-core cabling.

Additionally, Corning has created consolidated, colour-coded products that break out to all the necessary ports from rack to rack within a cluster. Because it's easier to manage, installation is up to 4x faster with cable assemblies than with traditional approaches and reduces the opportunity for human error.

Risks of Outdated Approaches

With an increasing demand for data, outdated cabling approaches like traditional patch cords are risky. For one, human error is much more likely with poor cable organisation, whether it is during installation or throughout ongoing maintenance and management.

And as we prepare for the future, it is challenging to scale AI networks with traditional patch cords. Errors like improper routing, mislabelled cables, and inventory mistakes can be costly and lead to network disruptions, data loss, and unnecessary downtime.

Preparing Networks for 800G and Beyond

Farsighted preparation for AI-specific workloads is a top priority for data centres, and structured cabling will only become more critical down the line. By using a standardised system, organisations can easily manage network connections and future upgrades, allowing for more scalability and flexibility within the framework. As port density increases to accommodate higher-gig optics, structured cabling offers a solution to ease installation and allow for updates to enable 800G and beyond.

With an eye on future demands, Corning aims to accelerate AI connectivity collaborating with leading semiconductor suppliers, such as **NVIDIA** and **Broadcom**. As part of these Co-Packaged Optics collaborations, Corning will supply state-of-the-art optical components designed to ensure optimal performance in modern data centres. Specifically, Corning EDGE8® products, supporting both single-mode and multimode optical interfaces, are key to delivering a future-oriented, high-density connectivity infrastructure.

Corning's engineering teams can provide essential guidance for data centre operators during the design phase, ensuring that cabling solutions are tailored to the specific bandwidth and architectural needs of the facility.

As the AI industry continues to evolve, so will the infrastructure inside data centres. By bringing field labour challenges into our factories with pre-terminated, structured cabling we're able to create significant time savings for data centre operators.

Evolving Networks

Since the development of the first single-mode fibre, Corning hasn't just responded to the world's demands. It has driven them.

Today, Corning's solutions are helping its customers cross new frontiers, including AI data centres and closing the digital divide with FTTH projects across Europe.

Let's dive into some of Corning's portfolio:

Evolv® Solution with Pushlok® Technology

Corning Evolv® Solution with Pushlok® Technology for Rapid Installation

Designed to solve challenges where space and speed translate into savings, the Evolv® Solution with Pushlok® Technology delivers fully sealed environmental protection and fast, easy incremental connections for increased deployment velocity.

The compact and fibre-dense connector allows operators to deploy more fibre in tighter spaces and its ease of integration into the existing network is also a significant advantage for network operators.

The slimline design of the Evolv® terminal fits snuggly against a chamber wall on an unobtrusive bracket, so it's out of harm's way when the chamber is opened reducing damage and faults to your network. It's fully pre-connectorised, reducing installation times by up to 50%. See the **solution in action** with Openreach.

RocketRibbon® Cable

RocketRibbon® Cable for Ultra-High Fibre Density

Corning® RocketRibbon® cabling solutions meet today's demand for reliable high-speed data transmission in duct, buried, or aerial applications. The cables are comprised of multiple optical fibres bundled together in a flat ribbon format that is high density, lightweight, and durable for easy handling and installations in tight spaces and extreme environmental conditions.

Conventional 12-fibre ribbons are maintained for installer familiarity and each ribbon is printed with a unique ID for fast identification and efficient fibre splicing management. Improved outside plant jacket marking allows for abrasion resistance and includes highly visible key cable specifications for faster field reference.

Additionally, Corning's **optimised pairing solutions** for the Fibre Optic Splice Closure 2178 family is ideal for RocketRibbon® cables, providing excellent system flexibility and reliable protection for brownfield and greenfield deployments, smart designs to make your job easier, and features to meet network demands.

EDGE™ Rapid Connect

EDGE™ Rapid Connect for Streamlined Data Centre Deployment

Corning EDGE™ Rapid Connect is a rugged, high-density cabling solution optimised to **complete data centre interconnects faster than ever**. Designed to interconnect data centres or large data halls, EDGE Rapid Connect utilises trunks with a Fast-Track MTP® Connector, enabling more fibres to be pulled through a single conduit, overcoming previous outside plant challenges.

Developed by Corning and US Conec, the Fast-Track MTP's small profile enables pre-terminated trunks with reduced 50.8 mm diameter pulling grips for small or crowded conduits. EDGE Rapid Connect allows the deployment of more fibres in less time, reducing trunk installation time by up to 70% and unlocking a new path to extreme density.

EDGE8® Solution

Corning EDGE8® Solution for Future-Ready Network Scalability

EDGE™ solutions have solved customer challenges across thousands of data centres around the world by maximising the consistency and speed-to-revenue benefits that pre-terminated products can bring.

While EDGE solutions continue to evolve, the foundation that they were designed upon – a fundamental understanding of the pain points inherent in managing a data centre – has not. Density, network uptime, speed, simplicity, and a clear migration path to meet future requirements are all still critical considerations in any data centre environment.

For maximum performance, the **Corning EDGE8® solution** provides the most future-ready path to 800G and beyond, including added superior network scalability, improved link performance and 100% fibre utilisation of a Base-8 design, providing notable cost savings.


Everon® Network Solutions

Everon® Network Solutions Supporting Converged Networking Needs

Corning Everon® is the complete enterprise-grade network solution that helps you keep your network connected and productive 24/7. Built on optical fibre technology, wired and wireless connectivity can live on a single network, reducing costs at installation and over the lifetime of the building.

Whether your LAN application serves a small medical clinic, a multi-terminal airport, or even a large campus of multiple buildings, all the components of the Everon solution integrate seamlessly:

1. **Campus Backbone LAN**: Optical network infrastructure solutions that interconnect building LAN to campus core

2. **Building Backbone LAN**: Fibre optic LAN for your building network infrastructure that connects telecommunications closets, equipment rooms, and entrance facilities

3. **Horizontal LAN**: Fibre to the Edge of your network. Complete optical networking solutions for wired and wireless connectivity
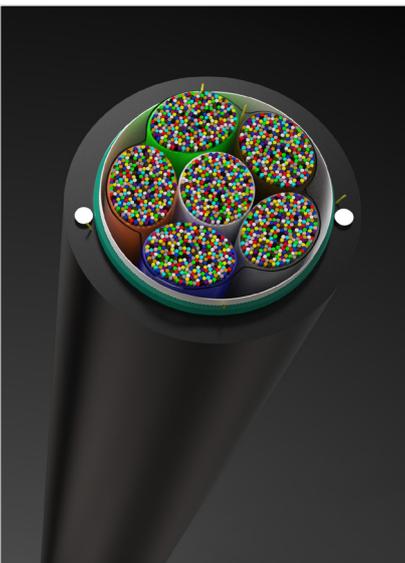
Contour™ Flow Cable

Contour™ Flow Cable Maximising Density in Duct, Buried, or Aerial Applications

Contour Flow cable, part of the new **GlassWorks AI™** portfolio for AI-enabled hyperscale data centres, represents an innovative breakthrough in outside plant cable technology, minimising cable diameter to maximise use of existing infrastructure and accelerate deployments.

The cable design is enabled by Corning® SMF-28® Contour fibre, a 40%-smaller fibre with improved bend resilience for high-density environments. Fibres are arranged in flexible Flow Ribbons for efficient mass fusion splicing. Higher-fibre-count (≥ 864F) options have finger peelable, color-coded subunits that can be readily accessed and routed directly into hardware without furcation, reducing cable preparation time by up to 30%.

Contour Flow cable is a more sustainable option as well. Due to its decreased diameter and increased fibre density, the cable enables up to a 27% reduction in carbon footprint per fibre, based on initial estimates pending third-party verification that compare 864F armoured option to the next-best alternative.

Meet the Award-Winning Evolv® Solution Multifibre Products with Pushlok® Technology

Leading through innovation, it lets you go faster, simpler, smaller, anywhere.

Whether you're building smart city infrastructure or optimising a multiacre industrial facility, you need a network with exceptional performance and future-ready flexibility to support the increasing demand for connected devices, real-time data analytics, and seamless communication. Now hardened Pushlok Connector Technology, the innovative solution bringing fast, reliable fibre connectivity to millions of homes and businesses across America, is available for Enterprise networks, too. This proven, pre-connectorised fibre solution dramatically reduces labour costs, increases deployment speed, and is small enough to install anywhere.

Push, click, lock, connected

- Faster cable installation
- Reduced onsite labour
- Less disruption and risk
- Future-ready bandwidth, easy scalability
- IP68 rated, watertight, dustproof

Learn more about how Pushlok Technology can unlock new levels of capability and efficiency.

Learn more

Case Studies: Pre-Connectorised Solutions In Action

Across industries, the need for faster, more efficient network deployment has never been greater. Pre-connectorised solutions are transforming connectivity by simplifying installations, reducing labour requirements, and accelerating time to service. From large-scale public infrastructure projects to high-demand entertainment venues, these solutions are helping organisations overcome space constraints, labour shortages, and installation challenges.

The following real-world examples highlight how pre-connectorised technology is making a tangible impact – improving reliability, enhancing efficiency, and enabling seamless, high-performance networks in even the most demanding environments.

La Nuit de l'Erdre: Music Festival

Founded in 1998, La Nuit de l'Erdre is a renowned music festival held in the scenic Port Mulon park, Nort-sur-Erdre, France. Held over four consecutive evenings, the festival welcomes approximately 20,000 people every night, along with partners, volunteers, and technicians.

To improve the overall festival experience, La Nuit de l'Erdre implemented fibre optics throughout the event site, enabling cashless payments, reliable Wi-Fi, and stronger mobile coverage. The Corning **Evolv® Solution** streamlined fibre deployment, requiring only simple connections – no extra steps were needed. This technology was crucial for setting up a reliable, high-quality network that remained waterproof in all weather conditions.

Corning as a Connected Experience Enabler

Thanks to the use of fibre optics throughout the event site, La Nuit de l'Erdre was able to offer a captivating experience to festivalgoers.

> **Everything is based on optical fibre with its connectivity and signal distribution. Corning is an essential partner since it set up the fibre optic network across the entire site.**
>
> **— Marc Jolys**, president of La Nuit de l'Erdre association

Key Elements that Made La Nuit de l'Erdre a Fully Connected Event

Low-Latency Video

Fibre optic lines delivered real-time stage footage with ultra-low latency. The optical loop processed the signal instantly to help ensure less than 100 milliseconds between capture and broadcast. Festivalgoers could even enjoy the concert from the dressing rooms in real time, for an even more immersive experience.

The Cashless Method

The cashless solution is a fully digital payment system, enabling quick and secure transactions at festivals, sports venues, and tourist sites. A convenient and, above all, secure method that allows for quick and easy payment, which facilitates the festivalgoers' experience. Everyone attending La Nuit de l'Erdre festival received a wristband to make all their payments through a cashless method. A high-speed internet connection was essential to power this system.

100% Connected Events: A Long-Term Objective

As the wider pandemic-inspired tech boom continues, event tech will continue to thrive. According to **Forrester's 2024 findings** cited **by Bizzabo**, 73% of organisations say they rely on between one and five event tech solutions, while 44% of event attendees find that technology that makes consuming events easier is one of the most important event experience elements. For example, some festivals add augmented reality (AR) and virtual reality (VR) technologies to include a new dimension to artists' performances. For this, low latency, and therefore fibre optics, is necessary to bring the virtual world to life.

Future events will provide a more connected and immersive experience for all participants. The use of an optical loop will be particularly useful for large-scale events such as the Olympic Games or the Rugby World Cup, and many others.

Addressing Connectivity Challenges for Large-Scale Events

There are several challenges for connecting large events under optimal conditions. For an event like the 2024 Olympic Games, there were 10 million spectators on site, with more than half the world watching on a delayed basis. To meet these demands, new event sites needed to be connected sustainably, either by leaving infrastructure in place or reusing equipment from other venues and training centres.

Optical loops are ideal for this scenario, as they can be installed once and redeployed for future events, such as international sports competitions, concerts, or festivals. This reduces costs, limits environmental impact, and ensures long-term connectivity for event venues.

Proven Success in Major Event Deployments

Many high-profile events have already benefited from Corning's cutting-edge network solutions. The common denominator of these projects is Corning's commitment to enabling digital, interactive experiences while meeting the growing expectations of consumers, fans, and event organisers. As demand for reliable, high-speed networks continues to increase, the ability to deploy scalable, reusable infrastructure will be key to future event success.

Scalable Network Solutions for any Event

Corning's portfolio and track record allow the company to support temporary events of any kind. Thanks to fully reusable optical loops, with solutions for FTTP (Fibre-to-the-Premises/ bringing optical fibre closer to the user) and enterprise network applications, Corning can offer tailor-made solutions for mass events both indoors and out.

Openreach: Easing Chamber Congestion

With nearly **74% of U.K. homes** now able to access full-fibre broadband, and fibre connectivity in Germany continuing to expand rapidly, FTTP deployment continues to expand quickly. Germany, aiming for nationwide gigabit coverage by 2030, faces similar challenges to the U.K., particularly in underground space constraints. Operators like Openreach are struggling with chamber congestion, where traditional solutions often require expensive and time-consuming off-site expansion.

Innovative Space-Saving Solutions

To address these challenges, Openreach worked with Corning Optical Communications to deploy **Evolv® Terminals and Drops with Pushlok® Technology**. The pre-connectorised solution significantly reduces the physical footprint of fibre installations.

Corning redesigned terminal ports and optimised input stub alignment, creating a device nearly 50% smaller than previous models. This allows for seamless integration in congested chambers, pole-mounted deployments, and building installations. With operators expanding at an unprecedented rate, compact and efficient solutions like Evolv® help ensure, a scalable, future-ready rollout.

Faster, More Efficient Installations Reduce Cost and Disruption

By implementing the Evolv solution, Openreach has accelerated installations, reducing time spent in underground chambers and minimising service disruptions. Underground installation of utility infrastructures, such as energy and telecoms, is a labour-intensive process which accounts for up to 80% of the overall deployment cost.

Major roadworks and excavation permits are disruptive and time-consuming, both while the work is carried out and while operators wait for excavation permits. This can take a year to be approved in some German cities. By using pre-connectorised solutions, operators can cut installation time by up to 40%, reducing labour costs and speeding up deployment.

Enhanced Network Reliability and Maintenance

With fibre networks **expected to support 1 Gbps as a standard by 2027**, ensuring reliability is paramount. The Evolv solution is designed to withstand harsh environmental conditions, including high groundwater levels. The ultrasonically welded housing prevents water ingress and unauthorised entry, protecting the integrity of the network.

By reducing manual splicing, which is one of the main causes of fibre failure, the Evolv solution improves long-term network stability and lowers maintenance costs. Fewer technician interventions mean lower OpEx and higher service reliability.

Regulatory Benefits and Scalability for Future Network Demands

Dense urban areas require compact, unobtrusive network solutions. Evolv reduces visual clutter in areas with strict architectural regulations. Sustainability laws also push operators to use low-impact materials and minimise construction-related emissions. The smaller footprint of Evolv means less material usage, lower transport costs, and reduced carbon impact, aligning with EU Green Deal standards.

With Germany's broadband consumption growing by 30% per year, and the U.K.'s demand following a similar trajectory, future-ready solutions are essential. Evolv supports both single-fibre and multifibre configurations, allowing for seamless upgrades without major infrastructure changes. As 5G, IoT, and AI-driven applications expand, Evolv provides the flexibility required to scale fibre capacity. Operators can deploy additional fibre in minutes, ensuring networks remain adaptive and high-performance without disruptive overhauls.

Supporting Nationwide High-Speed Connectivity

France achieved an impressive **90.04% FTTH/B coverage** in 2025. The U.K. (71%) and Germany (42.48%) are accelerating their efforts toward full fibre connectivity. The U.K. is targeting **85% gigabit broadband coverage by 2025**. Both the U.K. and Germany plan to reach full gigabit access by 2030. However, underground space limitations and deployment costs remain major hurdles. The Evolv solution provides a scalable, cost-efficient, and deployment-ready solution that allows for faster and more reliable fibre expansion.

As fibre infrastructure continues to grow, operators will rely on innovative, space-saving solutions like Evolv to help overcome physical limitations, reduce costs, meet regulatory standards, speed up deployment, and ensure the successful rollout of next-generation connectivity.

Accelerating Hyperscale Data Centre Expansion

In 2020, a leading hyperscale data centre operator in Canada set out to expand its computing and storage capacity by constructing a new facility adjacent to its existing building. This development aimed to nearly double its network performance and storage capabilities. For seamless integration, the operator required high-density fibre optic connectivity. Corning Optical Communications provided advanced cabling and hardware solutions, while Litewave Communications, an experienced fibre optic construction company, oversaw the installation.

Complexity and Time Constraints

The project, which was executed within an active construction site, presented logistical and safety challenges, requiring coordination with other trades such as electrical and HVAC teams. Traditionally, 3,456-fibre trunks are pulled between buildings and fusion spliced on-site, a time-intensive process demanding significant technical expertise. Labour shortages, pandemic-driven supply chain disruptions, and a preference to minimise on-site personnel further added to the complexity.

Innovation with EDGE™ Rapid Connect

To address these issues, Corning introduced the **EDGE™ Rapid Connect Solution**, a pre-terminated fibre optic system designed for large-scale installations. This plug-and-play solution eliminated the need for fusion splicing, enabling faster and simpler deployment. Using factory preassembled Fast-Track MTP® Connectors, installers could complete connections without specialised training, drastically reducing the installation time.

The system's impact was tested in a side-by-side trial by Litewave Communications, where traditional splicing and pre-terminated installation methods were compared under identical conditions.

Unprecedented Efficiency

The trial revealed that the EDGE Rapid Connect Solution completed installation 69% faster than traditional fusion splicing. By removing the need for time-consuming splicing, the solution shaved hours off the process and reduced labour demands. Smaller-diameter pulling grips and optimised connector designs improved handling, maximised conduit space, and ensured efficient deployment with minimal waste, supporting sustainability goals.

This case highlights the transformative potential of innovation in data centre expansion. By combining speed, simplicity, and reliability, the EDGE Rapid Connect Solution provided a scalable and future-ready approach for hyperscale environments, delivering on both operational and environmental priorities.

Industry Innovations and Market Trends

The Role of 5G, Industry 4.0, and AI in Future Network Deployments

Broadband is a cornerstone of economic strategies worldwide, enabling seamless workflows, e-commerce, and advancements in industries such as healthcare, finance, and manufacturing. Expanding broadband access is essential not only for providing equal opportunities but also for supporting the growing demands of the digital economy. As a result, both governments and private enterprises are heavily investing in fibre-based broadband infrastructure. However, the challenges go beyond just improving residential and commercial access. The rapid evolution of 5G, Industry 4.0, and AI-driven data centres is creating an increased need for ultra-reliable, scalable fibre solutions to keep pace with these advancements.

Supporting 5G Networks and Preparing for 6G: The Fibre Backbone of Ultra-Fast Connectivity

The shift to 5G represents more than just a generational upgrade. Rather, it is a fundamental rethinking of mobile connectivity. The collection of technologies architected together to enable 5G is changing the way people interact with devices and each other. Beyond simply offering a faster network, 5G answers pent-up demand for a faster, more flexible, and more reliable broadband wireless service, enabling the deployment of an entirely new class of wireless services. Unlike previous network generations, **5G relies on fibre infrastructure** to deliver ultra-fast speeds, near-zero latency, and seamless communication between millions of devices. Research is already underway on the next generation of mobile communications, 6G. In the not-too-distant future, preparations will also be made for its planned rollout in 2030.

The expansion of smart cities, IoT-enabled automation, and cloud-based applications requires Fibre-to-the-Site and Fibre-to-the-Antenna deployments. Fibre-to-the-Site solutions replace traditional coaxial cables with high-capacity fibre, improving reliability and bandwidth. Fibre-to-the-Antenna solutions provide low-latency, high-speed connectivity between base stations and network cores, while BPEO Fibre Closures offer pre-assembled, weather-resistant fibre enclosures for both small cell and macro networks.

Accelerating Deployment with Pre-Connectorised Fibre

These connections ensure that small cells and macro sites can transmit the vast amounts of data generated by connected devices. 5G's success is directly tied to the speed at which fibre networks can be deployed. Pre-connectorised fibre solutions are designed to support and accelerate the global rollout of 5G.

Evolv® Terminals with Pushlok® Technology simplify small cell deployments, offering compact, plug-and-play connectivity for urban and suburban environments. This helps meet the performance expectations of industries that depend on real-time data processing, such as autonomous vehicles, industrial automation, and telemedicine.

Debunking 5 Common Myths About Pre-Terminated Fibre Solutions

Industry acceleration depends also on separating fact from fiction. By applying professional insights, we can systematically address some of the most common misconceptions about fibre connectivity and dispel long-standing myths.

Untested? Unrepairable? Too complicated? Persistent myths and outdated assumptions continue to surround **pre-terminated fibre solutions**. In reality, pre-terminated fibre is proven, reliable, and field-tested, enabling faster network deployments and reducing overall costs. **Discover the five most common myths about connectorised fibre** and learn how these solutions can help save time and money in your next fibre broadband deployment.

AI-Driven Automation and Smart Manufacturing: Optimising Industrial Connectivity

Industry 4.0 is revolutionising how factories, logistics hubs, and industrial operations function. Smart manufacturing is built on the foundation of AI, machine learning, and IoT-connected devices, all of which require high-speed, low-latency communication and real-time data processing. Fibre optic networks provide the reliability and bandwidth needed to support autonomous production lines, predictive maintenance systems, and machine-to-machine communication.

Automation is transforming productivity in industrial environments, reducing human error, and optimising operational efficiency. Fibre ensures continuous data flow between AI-driven systems, allowing real-time monitoring, remote diagnostics, and rapid decision-making. Unlike copper networks, fibre is immune to electromagnetic interference, making it the preferred choice for industrial applications that require stability and security.

Edge Computing for Smart, Connected Shop Floors

Smart factories are increasingly dependent on edge computing, which enables AI-powered analytics to run closer to data sources rather than relying solely on cloud infrastructure. This requires ultra-reliable, low-latency fibre networks that can handle real-time processing at the edge.

The rise of AI-driven automation in manufacturing is creating unprecedented demand for low-latency fibre networks. Large-scale AI applications require constant access to massive data sets, driving the need for scalable, high-capacity fibre infrastructure. Pre-connectorised fibre solutions streamline deployment, enabling operators to build AI-ready networks at speed and scale.

The AI-Driven Data Centre Boom: Scaling for Future Demand

Data-intensive AI workloads require **east-west traffic within data centres**, which means fibre connectivity must support ultra-fast communication between computing clusters. **Corning's high-density fibre solutions are optimised for hyperscale AI data centres**, offering spine-and-leaf architectures that enhance processing efficiency while reducing operational complexity.

The explosion of AI and cloud computing is driving a new wave of data centre expansion. AI workloads demand significantly higher bandwidth than traditional cloud applications, leading to **rapid fibre deployment across hyperscale data centres**. Large-scale machine learning models and real-time AI training require high-speed, low-latency fibre connections between thousands of GPUs and compute nodes to ensure efficient training and inference processes. Fibre-to-GPU connectivity plays a critical role in ensuring seamless communication between processing units, enabling AI applications to operate at scale.

Pre-Connectorised Fibre for Hyperscale Data Centres

The surging demand for Machine Learning and Deep Learning, reliant on complex artificial neural network structures, is rapidly making energy consumption the primary limiting factor for data centres. To overcome this constraint and achieve the requisite computational power, it is becoming increasingly necessary to interconnect multiple data centres. This distributed approach critically depends on high-capacity, low-attenuation fibre optic connections that offer the highest possible density to efficiently leverage existing ducting infrastructure, thereby ensuring the seamless and energy-efficient flow of data between facilities.

Energy efficiency is another major challenge for data centres. The computational power required for AI models generates significant heat, necessitating advanced cooling solutions. Fibre optic networks play a crucial role in improving energy efficiency by reducing power consumption compared to legacy copper-based connections.

The need for rapid, scalable fibre deployments in AI-driven data centres has made pre-connectorised solutions indispensable. Traditional splicing techniques are no longer practical for hyperscale environments, as they slow down deployment timelines. Corning's pre-connectorised fibre solutions enable streamlined connectivity without complex setup, cutting deployment times by up to 70% while helping ensure seamless scalability.

Best Practices Checklist

Considerations Before Implementation

Before deploying pre-connectorised fibre solutions, network operators must assess several key factors to help ensure a seamless and efficient installation. Below are critical considerations to keep in mind:

1 **Network Design and Infrastructure Compatibility**

Evaluate existing network architecture to determine how pre-connectorised solutions can be integrated.

Ensure that the pre-connectorised components align with the required performance specifications (e.g., bandwidth, latency, and resilience).

Plan for scalability to accommodate future expansions without significant redesigns.

2 **Deployment Environment and Installation Conditions**

Assess physical space constraints, such as underground ducts and chambers, data centre racks, and in-building pathways.

Choose solutions that offer weather-resistant and durable designs for outdoor or harsh environments.

Factor in environmental considerations such as temperature variations and exposure to external elements.

3 **Skilled Workforce and Training Needs**

Determine whether existing teams require training on handling pre-connectorised solutions.

Opt for solutions that simplify installation to reduce dependency on highly specialised labour.

4 **Cost and ROI Analysis**

Compare the upfront investment of pre-connectorised solutions versus long-term cost savings in labour and maintenance.

Calculate expected reductions in deployment time and related cost benefits.

Assess potential improvements in network performance that enhance customer satisfaction and retention.

5 **Compliance and Regulatory Requirements**

Ensure compliance with industry standards and local regulations for fibre optic deployments.

Verify product certifications and environmental sustainability standards.

Conclusion

The adoption of pre-connectorised solutions is transforming fibre optic network deployments by significantly reducing installation time, minimising reliance on skilled labour, and improving overall efficiency. These solutions offer plug-and-play connectivity, ensuring faster rollouts for data centres, FTTH deployments, and enterprise networks. By eliminating manual splicing and on-site terminations, network or data centre operators as well as enterprises can achieve enhanced reliability and cost savings while ensuring a scalable infrastructure for future growth. Quicker deployments also help reduce the reaction time (to connect new customers or services), delivering a competitive advantage, customer satisfaction, and higher ROI.

As a pioneer in optical fibre technology, Corning has been at the forefront of fibre optic innovations for decades. Its pre-connectorised solutions – such as Evolv® Terminals with Pushlok® Technology, RocketRibbon® ultra-high-density cables, EDGE™ Rapid Connect solutions, and Corning Configured Racks – represent only a portion of its offerings designed to meet modern connectivity challenges. By leveraging Corning's expertise in material science, network operators can deploy high-performance fibre solutions with increased speed, efficiency, and sustainability.
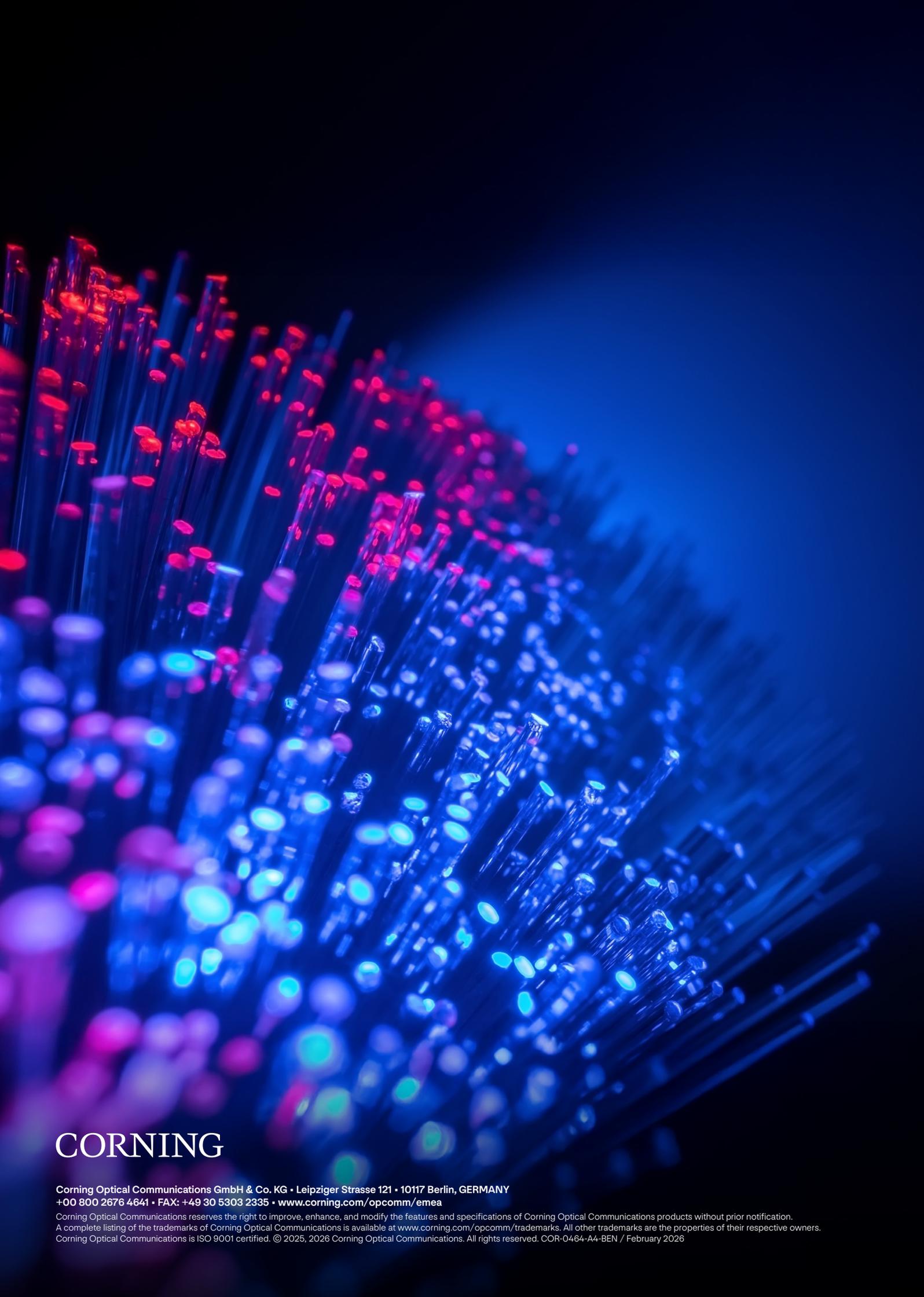
Corning's Four S Model (Speed, Space Optimisation, Simplicity, and Sustainability) continues to drive its product development, ensuring that **Corning's solutions not only meet today's network demands but also anticipate future technological advancements**.

Looking ahead, pre-connectorised fibre solutions will play a crucial role in shaping next-generation networks. As digital infrastructure becomes ubiquitous, enterprise networks will serve as the backbone for smart buildings, enabling advancements in disruptive technologies and delivering immersive user experiences. Edge computing and distributed networks will push fibre connectivity closer to the end user, supporting the growing need for localised data processing and real-time applications. AI and machine learning integration will drive automated network management and predictive maintenance, enhancing efficiency. The expansion of 5G networks will further accelerate the demand for scalable fibre optic infrastructure, requiring more advanced connectivity solutions. Sustainability initiatives will also take priority, with eco-friendly materials and energy-efficient practices becoming standard in fibre optic manufacturing and deployment.

As the demand for high-speed, reliable networks continues to grow, pre-connectorised solutions will remain a critical enabler of efficient, future-ready connectivity. By embracing these innovations, network operators can stay ahead in an evolving digital landscape while ensuring superior performance, cost efficiency, and environmental responsibility.

In today's evolving landscape, this book is designed to provide valuable insights not only into AI and Data Center topics but also to address the needs of a broad range of stakeholders within the telecommunications and networking industry. It is tailored for telecommunications companies, utilities, and alternative operators building Telco networks, as well as enterprise customers seeking to extend their networks with the latest technologies and thrive in an interconnected world.

Ready to get started? Contact your Corning representative today.

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