



Q&A

WITH JABULANI DHLWAYO, DIRECTOR OF MARKETING DEVELOPMENT, CORNING

Optical fibre has become the cornerstone of the telecommunications industry. From Corning's perspective, where do you see this industry going?

Many communities throughout the world, including Africa, are now connected by optical fibre, which transmits optical telecommunication signals at the speed of light. As individual homes are connected and as fibre reaches the desktop in office buildings, there is a bottleneck inside the home and within computing devices themselves. Current in-home networks will not cope with the ever increasing number of bandwidth hungry devices such as game consoles, HDTVs, IP phones, and other emerging devices.

In the computer, the copper or aluminium interconnects that connect processing chips to one another, and the computer to peripheral devices, present a severe bottleneck. There will be a focus in the industry on developing next generation in-home networks and optical interconnects to replace the copper or aluminium. We also continue innovating new or enhanced optical fibre for submarine, terrestrial long-haul, and access networks to meet the insatiable bandwidth demand as the industry looks to 100 Gb/s transmission and beyond.

What makes Corning optical fibre different from fibre manufactured by other providers to the industry?

Corning fibre is synonymous with quality, which is critical for network reliability. Corning invented both processes used for manufacturing optical fibre today: the outside vapour deposition (OVD) and inside vapour deposition (IVD) processes. Corning uses the OVD process because of its ability to give the fibre superior geometrical consistency. Corning optical fibre quality has achieved recognition through the Malcolm Baldrige National Quality Award given to it by the

United States Department of Commerce. The Baldrige award is the only formal recognition of the performance excellence of both public and private US organizations given by the United States government. The fact that Corning is the most widely deployed brand of optical fibre in the world is further testimony to the quality of Corning fibre. Corning terrestrial long-haul fibre has the lowest attenuation and PMD of any, which is critical for upgrades to higher data rates. Corning® LEAF®, a non-zero dispersion shifted fibre, has the highest effective area, making it possible to launch more power in the fibre and transmit many channels without encountering undesirable non-linear effects.

Corning is offering a bendable fibre solution that is revolutionary in its own right. Has Corning seen good demand for this kind of fibre, and where has most of this demand been seen?

Corning has observed strong demand for its bendable fibre product portfolio from operators deploying Fibre to the Home (FTTH) networks and new data centres throughout the world.

This demand has been most prevalent in North America, Western Europe, and Japan. We are also starting to see demand growing in China and a few African countries where FTTH is being deployed in large estates and gated communities.

Corning offers several low-loss fibre products. Is this not generally the benefit of fibre over other solutions like copper? Or are there various levels of loss that are acceptable within the fibre industry?

In general, fibre has very low loss compared to copper. However, the loss of fibre varies significantly between fibre types and from one manufacturer to another.

For example, the attenuation specification offered on standard single-mode fibre from different manufacturers has a range of 0.05 dB/km. This may look like a small number but it can translate to a 200 km difference in network link length that is possible before expensive regenerators are required; therefore, by selecting the lowest-loss fibre, operators can save on the overall cost of the network. Corning's low-loss fibre is critical for operators who will migrate to higher data rates (40 Gb/s or 100 Gb/s) over the 20 to 30-year lifetime of the network, without the need to install new fibre.

What current deployments in Africa are using Corning optical fibre? And what is the current market that Corning holds in Africa?

All submarine cables already deployed or being deployed in Africa use Corning fibre. Many terrestrial long-haul networks being deployed throughout the continent are also being built with Corning optical fibre.

The more operators understand the impact of the quality of fibre on network longevity and overall cost of ownership the more they turn to Corning for their fibre supply. In the past, some operators chose the cheapest and lower-quality fibre and transmission equipment but after frequent network failures

and the high costs associated with repairing networks, quality is becoming an important factor for them. Quality is critical – and for operators that embrace this knowledge, Corning becomes the preferred supplier.

Corning still offers copper solutions. Have you seen a massive shift of business from copper to fibre optics, and are you seeing any growth in the copper business at all?

Today, copper is mostly deployed in short-distance applications such as data centres and local area networks (LAN). As transmission speeds increase, the distance possible with copper is reduced significantly.

For example, at 10GBase-T, copper twisted-pair cabling is capable of transmitting only up to 100m. Fibre will therefore continue to displace copper over time. The table below shows that fibre has overtaken copper in enterprise network applications and continues to gain.

	<i>Copper</i>	<i>Fibre</i>	<i>Comment</i>
<i>Data centres</i>	<i>40%</i>	<i>60%</i>	<i>Fibre is increasing</i>
<i>In-building backbone</i>	<i>20%</i>	<i>80%</i>	
<i>Campus backbone</i>	<i>5%</i>	<i>95%</i>	



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A number of African operators still have copper in their metropolitan networks, but when they make network upgrades they replace the copper with fibre.

Can you briefly describe the differences between the Corning Cable Systems and Corning Optical Fiber business units?

Corning Optical Fiber develops and manufactures optical fibre, the glass strands that are used to make fibre optic cable. Corning Optical Fiber supplies Corning Cable Systems and many other fibre optic cable makers throughout the world with optical fibre. Corning Cable Systems, on the other hand, uses fibre from Corning Optical Fiber to manufacture optical fibre cable that can be installed in a network by putting the necessary protecting materials around the fibre. Corning Cable Systems also manufactures passive optical equipment used in optical networks, such as connectors, splitters, closures and optical assemblies as well as hardware and equipment.

What are the main factors African operators should consider when selecting fibre for their telecommunication networks? Is it not enough for operators to specify cable based on International Telecommunication Union (ITU) standards?

It is important for operators to understand that while the cost of fibre constitutes a very small proportion of the network (2-6%), fibre is the most important. Once installed, networks should be able to be upgraded to higher data rates over the life of the network (20-30 years) by upgrading the electronics and not

reinstalling new fibre. Some of the key attributes operators should pay attention to are loss (or attenuation), PMD, and chromatic dispersion.

The ITU guidelines are a minimum requirement that every manufacturer should achieve. Operators specify fibre based on their network requirements, and in many cases specifications for key attributes are tighter than the ITU guidelines. Operators should have the capability to test incoming cable to verify the manufacturer's test results.

Many operators in Africa experience a lot of cable cuts, leading to long down times and loss of revenue. What is Corning's advice to these operators?

Our understanding is that most fibre cuts are a result of people stealing cable, believing it to be copper cable. The public has to be made aware that most cable being installed today is fibre and it has no value to them. Some operators have put signs along cable lines informing people that there is no copper in the cable. Even after the problem of cable stealing is eliminated, cables links can receive frequent cuts through ground excavation by mechanical digging vehicles. As a fibre manufacturer, our contribution is to offer low-loss optical fibre. Low-loss fibre can enable the operator to make more repairs on the fibre. The difference between a 100 km span of 0.18 dB/km attenuation fibre and 0.22 dB/km attenuation fibre, for example, is at least 10 additional repairs. **AT**