


# GET THE FACTS ON OPTICAL FIBER!

This revolutionary technology invented by Corning connects our world literally at the speed of light. We invite you to learn more.



CORNING



Every once in a great while a technological breakthrough comes along that changes the world. Today that technology – the union of glass and light – is optical fiber.



## NECESSITY IS THE MOTHER OF INVENTION

Responding to consumer demand for bandwidth beyond what traditional cables could provide, three Corning scientists – Dr. Robert Maurer, Dr. Peter Schultz, and Dr. Donald Keck – invented the first commercially viable low-loss optical fiber in 1970. Their revolutionary discovery provided the world with a rapid, reliable telecommunications medium with low signal loss over long distances and virtually limitless bandwidth.

In its basic form, an optical fiber is a hair-thin, highly transparent strand of glass comprised of three parts:

- (1) the core that carries information in the form of light signals;
- (2) the cladding which surrounds the core trapping the light within it; and
- (3) the durable, protective outer coating. Encoded into light signals, information travels through the fiber where it is decoded locally or thousands of miles away.

## THE FUTURE IS HERE

When discovered, optical fiber promised a future of unlimited possibilities, but only if it could be mass-produced and widely accessible. Thanks to Corning, it is. Corning's proprietary manufacturing processes continue to set the industry standard for the deployment of low-cost, high-capacity optical fiber communications systems. Today, with more than 1.5 billion kilometers of optical fiber installed around the globe, we are a world dependent upon the speed-of-light transmission of information to virtually anyone, anywhere at anytime. In other words, the future is here.



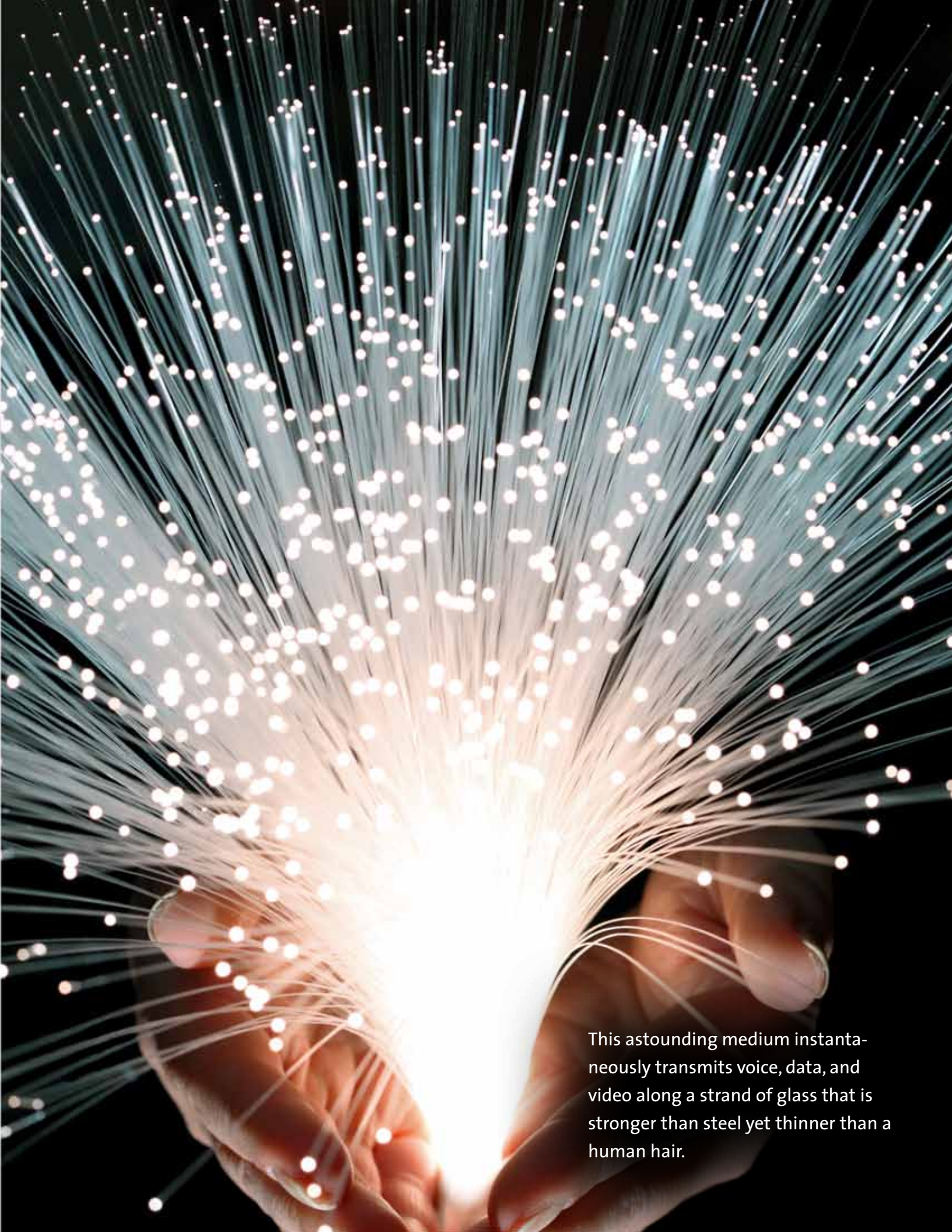
## CONNECTING AT THE SPEED OF LIGHT

Corning's product innovations continue to bring optical fiber closer to our homes and hands, transforming the ways we live, work and play and enabling service providers to deliver seamless, instant, and continuous connections to the Internet and other communications networks. This access has dramatically increased our entertainment options – HDTV, e-books, online shopping, and game systems; opportunities for social interaction, chat rooms, blogs; and job flexibility – remote e-mail access, teleconferencing, wireless laptops, and telecommuting. None of this – even wireless – would be possible without the consistent reliability, ongoing durability, and limitless bandwidth offered through optical fiber.

Likewise, educational institutions, healthcare facilities, and businesses are relying on optical fiber for their Data Centers and Local Area Networks (LANs). Fiber directly to the desk enables users to communicate over longer distances and reserve higher bandwidth for future expansion. From online courses to remote patient monitoring to international teleconferencing, optical fiber continues to increase productivity and profitability for organizations by streamlining the ways in which they provide services around the world.








This astounding medium instantaneously transmits voice, data, and video along a strand of glass that is stronger than steel yet thinner than a human hair.





Today, optical fiber remains the best choice for communications networks due to its superior transmission quality, cost-effectiveness, rugged durability, and continued scalability.

## FIBER: THE CLEAR CHOICE

### Quality Transmission

Unlike copper cabling, optical fiber is immune to “electrical noise” (Electromagnetic Interference or EMI). When we’re frustrated by “static” on our phones or televisions, fiber’s reliable signal is a welcome convenience. But within industrial and military environments, clear data transmission is a vital necessity. Industries with loud production lines and heavy machinery have turned to fiber optics for their internal communications. Similarly, the United States military uses fiber to support time-critical communications because its signal is difficult to damage, tap, or jam.

### Cost-effectiveness

As of 2010, submarine cables now link all of the world’s continents except Antarctica. Copper networks need multiple amplifiers and repeaters to boost light signals and prevent signal loss. This additional equipment increases network cost over long distances. Corning’s new ultra-low-loss, large-effective-area submarine optical fiber, Vascade® EX2000, however, is designed for signal transmission over hundreds of miles before it needs to be amplified or regenerated, making it a cost-effective alternative to copper wire.

### Rugged Durability

Optical fiber may be made of glass, but inch for inch it’s stronger than steel and more durable than copper. At Corning’s Center for Fiber Optic Testing facility, we set the industry standard for performance testing. Every centimeter of optical fiber is strength tested at a minimum of 100,000 pounds per square inch to ensure its mechanical robustness.

There is no “theoretical lifetime” for optical fiber. The fiber optic cables manufactured and installed 40 years ago are still in use today, and we know our newest cables are even stronger. Our Outside Plant (OSP) cables, for example, are designed to withstand environmental extremes. They offer clear signal performance over a wide range of temperatures while resisting water ingress and years of the sun’s ultraviolet radiation. And by carrying light instead of electricity, OSP cables are safe from lightning strikes or electrical faults. Fiber is the clearest choice today, and its rugged durability is showing us that we have every reason to believe we’ll be relying upon it for many years to come.

### Scalability

Traditional copper cabling constantly struggles to meet growing bandwidth needs. As data traffic on wireless networks continues to explode (90,000 terabytes of traffic per month today is expected to hit 3,600,000 terabytes per month by 2014), optical fiber’s scalability makes it the clear choice for what’s now and what’s next.

## JOINING THE GLOBAL CONVERSATION

Once considered a personal convenience, being “connected” has now become an international priority. In today’s world, optical fiber is the core of connectivity, providing the medium through which commerce and culture are being simultaneously created and communicated on a personal and global scale.


Corning led and continues to lead the development and delivery of the latest generation of optical fiber, making it practical for new applications and possible for burgeoning markets. As global telecommunications networks expand and evolve, Corning will lead the way forward in connecting each and every one of us at light speed, one strand of fiber at a time.





Corning continues to lead the development and delivery of the latest generation of optical fiber.





Fiber is the the clear choice for  
what's now and what's next.  
That's why we are working to  
ensure that the next generation  
fibers deliver well into the future.



### **FIBER IS FAST**

Optical fiber can transmit 15.5 terabits of data per second over a distance of 7,000 kilometers. Translation? It would take approximately 25 seconds to send the entire iTunes catalogue from the sunny beaches of Florida to the bustling streets of London .

### **FIBER BENDS**

While the glass we use every day seems inflexible, Corning's revolutionary ClearCurve® single-mode and multimode optical fiber is flexible enough to bend around tight corners, twist into hard to reach places and loop within smaller terminal boxes without sacrificing performance.

### **FIBER IS LIGHT AND EASY TO HANDLE**

An optical fiber is only 250 µm diameter -- the size of a human hair. Fiber optic cables are orders of magnitude smaller and more flexible than the CAT5 copper cables that provide a fraction of the bandwidth.

### **FIBER'S CAPACITY BLOWS COPPER AWAY**

When it comes to bandwidth, fiber is king. A single fiber is capable of transmitting 250 million phone conversations every second. One mile of fiber weighs about 1/4th of a pound whereas copper cable with the same information-carrying capacity would weigh 33 tons.

### **FIBER BRINGS US TOGETHER**

Nearly two billion people are instantaneously and simultaneously accessing the Internet, thanks to optical fiber. We're able to exchange information, conduct business, learn, share, be entertained, and stay connected with family and friends almost anywhere, almost anytime.

### **FIBER MEANS BUSINESS**

A one millisecond advantage in trading applications can be worth \$100 million a year to a major brokerage firm. (Information Week April 2007)

### **FIBER IS GREEN**

Unlike traditional copper wiring, optical fiber doesn't generate excess heat while operating, reducing the load on power-hungry data center cooling systems. Businesses interested in internationally recognized Leadership in Energy and Environmental Design (LEED) certification are choosing optical fiber cabling systems to create more cost-efficient, environmentally friendly data centers.

### **FIBER IS MORE SECURE**

Unlike copper wires, it is very difficult to tap or bug optical fiber. An attempt to tap into a fiber cable can cause the glass to break, likely triggering maintenance and/or surveillance alarms. The low power levels used for optical signals increases the system sensitivity to any invasive power loss.

### **FIBER IS COST-EFFECTIVE**

Traditional copper cable requires repeaters to amplify signals every mile, whereas optical fiber systems need repeaters every sixty miles or more. This cost advantage was one of the key drivers in the installation of undersea cables that now connect every continent except Antarctica.

### **FIBER KEEPS GETTING BETTER**

The first viable low-loss fiber invented by Corning in 1970 had an attenuation of 17 db/kilometer. Today, Corning's SMF-28® ULL fiber is 100 times better with signal loss of just 0.17 db/kilometer. And, we're working to ensure that the next generation fibers are better still.

## WANT TO KNOW MORE?

For a comprehensive overview on optical fiber, visit us on the Web at: [www.corning.com/opticalfiber](http://www.corning.com/opticalfiber).

Or, you may contact the Corning Optical Fiber Information Center (COFIC), the most extensive fiber-optic information resource in the world. With just a phone call or an e-mail, you can be in touch with a team of trained information specialists and technical experts who are ready to answer your questions and provide you with the information you need. Quick answers and a personalized information package can be sent to you within 24 hours. If you currently deploy optical fiber, are considering it for the future, or simply need information on fiber technology, contact COFIC by:

Phone: 607-248-2000

(8:00 a.m. and 5:00 p.m. EST, Monday through Friday)

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