



November 8, 2005

NTT Develops Optical fiber Cord that can be easily bent, folded, and tied, and enables easy connections

-- Ushers in an era in which anyone - not just experts - can install optical fiber cables with a "DIY" approach --

Nippon Telegraph and Telephone Corp. (NTT; Head Office: Chiyoda-ku, Tokyo; President and CEO: Norio Wada) has developed a revolutionary new optical fiber cord that offers a degree of freedom in cable installation that was considered impossible using conventional optical fiber. The new cable uses "Holey fiber [<http://www.ntt.co.jp/news/news03e/0312/031217.html>]"(*1), an optical fiber with a new composition, for which NTT opened the way for new applications ahead of any other manufacturer in the world. This new product was developed through the combined efforts of NTT and its Group companies.

When conventional fiber is bent or folded forcefully, the optical signal inside the fiber leaks, causing breaks in communication. The newly developed optical fiber cord, however, enables smooth communications not only when bent or tied into a knot, but even when it is folded at a right angle. Because it can be used far more easily than any existing optical fiber cord, as long as there is an optical outlet (*2) in the user's home, anybody can easily install an optical fiber cable in their room themselves, even if they have no specialized skills or knowledge (Fig. 1).

Based on its current management goal of "Providing optical services and next-generation network services to 30 million customers by 2010," the entire NTT group will work to promote the implementation of optical fiber networks in preparation for the expansion and proliferation of optical fiber services. This revolutionary optical fiber cord improves efficiency in the process of laying optical fiber cables, which has been considered a problem in the past, and supports the opening up of large-volume optical fiber communications in the future.

Background to Development

With the rapid proliferation of optical fiber services, we are entering an era in which optical fibers are becoming a common fixture in regular households. Up to now, installing these cables in the home required specialized tools, and great care had to be taken because folding or otherwise excessively bending the fiber could cause breaks in communication; as a result, the installation task required a high level of specialized skills. Particularly in the case of in-home installations, the workmen always made sure to leave enough optical fiber cable that the customers could set up the computer terminals in keeping with their own lifestyles, but large bundles of cable tend to get in the way, and also make the room look cluttered.

The most promising way of installing optical fiber cable in even more homes in the future in an even shorter period of time, and ensuring maximum customer satisfaction,

is to enable these cables to be installed neatly and easily, as in the case of existing metal cables.

Product Features

The new optical fiber cable is comprised of highly flexible "Holey fiber," a protective cord covering, and a newly developed connector. The unique features of each of these three components, which are outlined below, combine to achieve outstanding optical and mechanical characteristics that could not be attained with conventional optical fiber cable.

(1) "Hole-assisted" Holey optical fiber

"Holey fiber," the central component in this product, uses "hole-assisted" fiber that contains a highly refractive glass core surrounded by glass with many small holes to achieve the optical and mechanical characteristics demanded for in-home optical fibers ([Fig. 2](#)). The refractive index of air is considerably less than that of silica glass, so this fiber acts as a reflective material to prevent any light from escaping, thus increasing its ability to trap the light inside. By trapping the light in this way, the light can pass through the fiber no matter how much the cable is bent, folded, or tied.

(2) Extremely flexible optical cord with high resistance to lateral pressure

The construction of this optical fiber cord, which is 4mm in diameter, reduces the burden on the optical fiber inside even if the cable is bent or stepped on. It also utilizes a flexible material that bends smoothly to ensure maximum ease of handling. In this way, the cable offers enough flexibility to allow smooth bending for easy installation around the user's terminal, as well as resistance to lateral pressure so that the optical fiber inside is not affected even if the user accidentally runs over the cable with the wheels of a chair. Another major advantage of this cable is that it remains smooth and flexible even when extra cable is tied up or bundled, rather than retaining the shape of the knot.

(3) Dust-resistant connectors with easy-cleaning function

The connectors on this cable are compatible with standard SC connectors ([*3](#)), and have a dust-resistant function that prevents dust from adhering to the connector surfaces when the user who has no specialized skills or knowledge connects or disconnects the cable. They are also equipped with a simple cleaning function that allows the user to easily remove any dust that might still appear on the connector surface.

Main specifications

Optical fiber cord

- Hole-assisted optical fiber; single core cord
- Cord diameter: 4.0mm
- Cord length: 1.5m, 3m, 5m

Connectors

- Compatible with standard SC optical connectors
- Simple cleaning function and dust-resistant function on connector surfaces

Future Developments

This revolutionary optical fiber cord is the first of its kind anywhere in the world. It incorporates the results of advanced research and development at NTT Laboratories to enable safe and easy applications by users even if they have no specialized skills or knowledge. Development of the cord will be completed before the end of 2005, and the product will be available to customers within the current fiscal year (ending March 31, 2006). This product is expected to add great momentum to the shift to "Do-It-Yourself" installations of optical fiber cables, which is expected to take place in the not-too-distant future.

Glossary

*1 Holey Fiber

The common name for optical fiber made from glass containing many tiny air holes. Among the more common types of Holey fibers are: Hole-assisted fiber (a highly refractive core surrounded by glass with many small holes), photonic crystal fiber (a silica glass core and glass with many holes), and photonic band gap fiber (a hollow core and glass with many small holes).

*2 Optical outlets

Similar to a modular jack for a telephone cable. These outlets, which contain an optical connector interface, come in two types: an "embedded type," in which the outlet is embedded in a switch box, and an "exposed type," in which the outlet itself is installed in the wall.

*3 SC connector

An optical connector created during the development of optical components in the basic research stages at NTT Laboratories. With the development of subscriber-type optical access systems, these connectors came to be recognized as being extremely economical, and since then they have in effect become the global standard for optical connectors.

[Fig. 1:"Do-It-Yourself" Optical Cord Installation \(Photo from Nov. 10, 2004,.press release: "NTT Group's Medium-term Management Strategy"\)](#)

[Fig. 2:Construction of Holey Fiber](#)

For further information, contact:
NTT Information Sharing Laboratory Group
Planning Division; Public Relations:
Chizuka, Sano, Ida
TEL:0422-59-3663
E-mail:koho@mail.rdc.ntt.co.jp

NTT NEWS RELEASE 