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## **Fast and easy deployment of massive optical access network A Preinstalled Optical Wiring Kit for FTTH**

-We have developed a new wiring system in collaboration with Matsushita Electric Works, Ltd. to enable the construction of an optical home network quickly and without special skills -

With a view to realizing 30 million FTTH ([\\*1](#)) subscribers by 2010, NTT (Nippon Telegraph and Telephone Corporation, Head Office: Chiyoda-Ku, Tokyo, President & CEO: Norio Wada) has developed a new wiring system for the large-scale deployment of FTTH that makes it possible to construct an optical home network quickly and without special skills.

A preinstalled wiring system means that a user (or constructors who received a commission) installs an optical network in a house before the service is deployed by NTT. This system has a set of optical wiring components that can be handled without special skills or tools. This kit makes it possible for anyone to construct an optical home network easily; work that until now has been undertaken by NTT.

This kit is designed for new houses equipped with optical wiring ducts. We developed this kit in collaboration with MEW (Matsushita Electric Works, Ltd., Head Office: Kadoma, Osaka, President: Koichi Hatanaka). The kit consists of duct wiring technology with optical fiber curl cord ([\\*2](#)), a short boot optical connector, and a pulling head for wiring in ducts (developed by NTT R&D), and an optical outlet that fits in a wall, and an outdoor optical cabinet installed by users (developed by MEW) ([Figure 1](#)).

This kit can also be applied to an existing house with ducts. It was carefully designed to be esthetically pleasing, safe and easy to handle and it will be marketed in the near future. The kit makes it possible to shorten the construction time because it needs no special skills and provides an approach to wiring an optical home network for both potential and existing FTTH users (for example, house builders, electrical/communication engineers, and ordinary users). This kit is a development of great significance with respect to FTTH services.

### **<Background>**

NTT is now proceeding vigorously with optical services such as B-Flet's with the goal of achieving 30 million FTTH subscribers by 2010. This makes it necessary to improve the efficiency of optical wiring construction in houses and realize a massive FTTH deployment in a short period.

However, the existing optical wiring method for houses requires a specialist and special tools (usually very expensive) and it also needs two operators (sender and receiver) to wire optical fiber through a duct.

We then started to consider issues related to optical wiring in houses. The two main problems we face when we wish to construct an optical home network efficiently involve realizing a wiring method that does not require special skills and reducing the construction time. The first step was to develop free bending optical fiber cord. This

cord can be easily handled by ordinary users and is simple to connect to other optical fibers. It can be bent tightly or turned back with a small radius without any loss increase. Free bending optical fiber cord can be used between an optical outlet and an ONU (\*3)([Figure 1](#)).

On the other hand, a preinstalled optical wiring kit for FTTH can solve these two problems simultaneously between an outdoor optical cabinet and an optical outlet because it requires no special skill or special expensive tools for optical wiring. This kit consists of various technologies and components developed by NTT and MEW respectively.

### <Features>

The most important feature of the preinstalled optical wiring kit for FTTH is that it utilizes a stretchable optical fiber curl cord terminated with optical connectors. Conventional optical wiring requires us to assemble the optical connector and store the surplus length of optical fiber on the premises. The optical fiber curl cord terminated with optical connectors enables us to realize optical wiring without the need for assembly and storage.

The preinstalled optical wiring kit incorporates the following features developed by NTT([Figure 1](#)).

- (1) Duct wiring technology with optical fiber curl cord
  - Optical wiring can be achieved without special skills and with reduced installation time.
  - The tensile strength required when we pull the optical fiber curl cord in a duct with six curves is less than 1 kgf (9.8 N).
  - A stretchable optical fiber curl cord can be used in ducts of different lengths.
- (2) Stopper for optical fiber curl cord
  - The ends of the optical fiber curl cord are protected from going in the duct.
  - The ends of the optical fiber curl cord can be kept at the outlets of the duct independent of the kind of terminated optical connectors.
- (3) Short boot optical connector
  - The boot is about one quarter (7mm) of the length of that of a conventional connector (30 mm).
  - The use of the short boot optical connector with reduces the size of the optical components such as the optical outlet.
- (4) Pulling head for wiring
  - The use of the connector adapter as the pulling head enables us to pull the optical fiber curl cord simply by inserting the terminated optical connector into the adapter.
  - Rotating parts in the pulling head prevent the optical fiber curl cord from twisting.

An optical outlet that fits in a wall, an outdoor optical cabinet installed by users, and a commercial duct, which constitute the other components of the kit, have been developed by MEW.

### <Future plans>

NTT is continuing to promote the research and development of premises optical wiring components that can be handled without special skills or tools, aiming at making to the business for the preinstalled optical wiring kit for FTTH in the coming year. As a leading information communication network company, NTT will try to improve customers' satisfaction by offering convenient and attractive FTTH services.

## <Glossary>

### \*1.FTTH (Fiber To The Home)

FTTH is a framework that supplies optical fiber to the home. FTTH can provide broadband and next generation network services via access networks.

### \*2.Optical fiber curl cord

This cord employs optical fiber with an extremely low bending loss that allows it to be curled. If the cord of a curl diameter of 16 mm and a curl length of 1 m is used, the tensile strength required when we pull it even in the duct to about the maximum length of 20 m is less than 1 kgf (9.8 N), which is very small in general.

### \*3.ONU (Optical Network Unit)

An ONU is a device for connecting an information terminal such as a personal computer or an IP telephone to the optical network.

[Figure 1 "Preinstalled Optical Wiring Kit for FTTH" \(Duct Wiring\)](#)

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