Furukawa Electric, Japan

INTRODUCTION OF OPTICAL FIBER SENSORS
Introduction of Optical Fiber Sensor

(Accommodated to ITU-T.G.652/657 fiber spec.)

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Furukawa Electric Co. LTD

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1. Introduction of Furukawa Electric

Furukawa Electric Corporate Profile

Company name: Furukawa Electric Co., Ltd.
Chairman: Masao Yoshida
President: Mitsuyoshi Shibata
Founded: 1884
Established: 1896
Paid-in Capital: ¥69,395 million
(As of March 31, 2015)
Net sales: ¥867,817 million (Consolidated) (Years ended March 31, 2015)
Employees: 46,134 (Consolidated)
Global Network (Telecommunications)

2. Sensing System Network & Sensor
2. Sensing System Network

Features of Optical Fiber Sensors

- **No Power Supply**
  - No Induction
- **Simple and Robust structure**
- **Sensor Signal transmitted via. Optical Fiber Network**
- **Lightning Resistant**
  - External Noise Resistant
- **High Reliability of low failure rate**
  - Cost effective
- **Monitoring to extensive area**
2-1 Optical Water Level Gauge

This sensor measures the water level as well as surface of water for sewer pipe, river, manhole and hand-hole. Sensor itself and transmission line are constructed by optical fiber, which enables to monitor the water-level and surface remotely without the power supply.

Remote monitoring which applies The Optical Fiber

2-2 Optical Water Immersion Sensor

- Detects the surface of water using floating construction.
- Able to detect the flooding status of the road and water-level of the river or manhole remotely. It is also available for water plant, water utilities and the dam.
- Non-power supply with explosion-proof structure enables the installation at harsh environment.
2-3 Optical Rain-Fall Gauge

Principle of operation

1 Optical Fiber (SM) ~ 20 km

2-4 Photonic Power Supply using Optical Fiber

This system supplies the power to the remote place (e.g. sensor and apparatus) using optical fiber.

Reduces the affects from lightning or noise.
2-5 Optical Fence Sensor

Outdoor perimeter security responding to advanced security needs. High-speed detection of intrusion via the fence.

Fiber Spec. ITU.T.G.652/657

3. Optical Cable & Fusion splicer
**Application-Specific Optical Fibers**
- covering all application areas

* AllWave® series include AllWave One, AllWave +, AllWave LL, and standard AllWave.

**Access Area: Optical Cables**

**Conventional Single Jacket, Loose Tube Fiber Optic Cable**

**Design / Overview**
A representative cross-section diagram of single sheath cable. A core wrapping tape is applied over the cable core to facilitate bonding spool is placed under sheath to ease its removal. A smooth black High-Density Polyethylene sheath is applied over the tape to complete the cable.

**New totally dry, Loose Tube Fiber Optic Cable**

**Design / Overview**
We offers a complete line of totally dry cables. By eliminating messy gels and filling compounds the handling and installation process is greatly streamlined, resulting in higher efficiencies. These cables are available in both loose tube or ribbon structures with dielectric and metallic sheath options.
### Application - Optical Drop Cables

**FTTX Round type Cable**
- Messenger wire
- Tight Buffer Fiber
- Strength member
- Sheath

**Design / Overview**
The FTTX cable designed to apply for last link in the optical network which get advantage from small size, light weight, easy strip, flexible, easy bend, well for install excellent crush and tensile resistance, jacket material: LSZH

**FTTX Flat type Cable**

**Fiber Spec.**
- ITU-T.G.652
- ITU-T.G.657

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### Fusion Splicer S178A

**Rugged**
- Shock/ Water/ Dust

**Compact**
- Hand held at 2.3kgs

**Fast**
- 7 sec splice and

**Fiber Spec.**

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4. Conclusion

Conclusion

Optical Sensor

- Effective to prevent disaster
- Easy & Fast installation

_Furukawa Electric Group has various optical products._
Thank you!