FUJIKURA NEWS 6

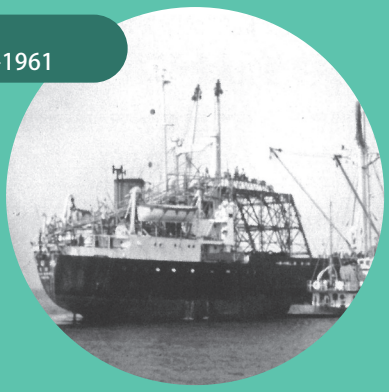
2020

No.466

Fujikura Modern history -2

Economic boom of 1958-1961

Fujikura completed its first overseas installation of the Arabian Oil Co., Ltd.'s submarine cable in 1962. At that time, Fujikura accelerated technological and product development.
The foaming polystyrene coaxial cable delivered to the predecessor of NTT Research Center was recognized for excellence in the characteristics. The technology was exported to the US and Canada and granted a patent. Many relevant companies including Fujikura Plastic, Fujikura Transport, Fujikura Warehouse were founded.



Arabian Oil's submarine cable installation work (1962)

Power & Telecom

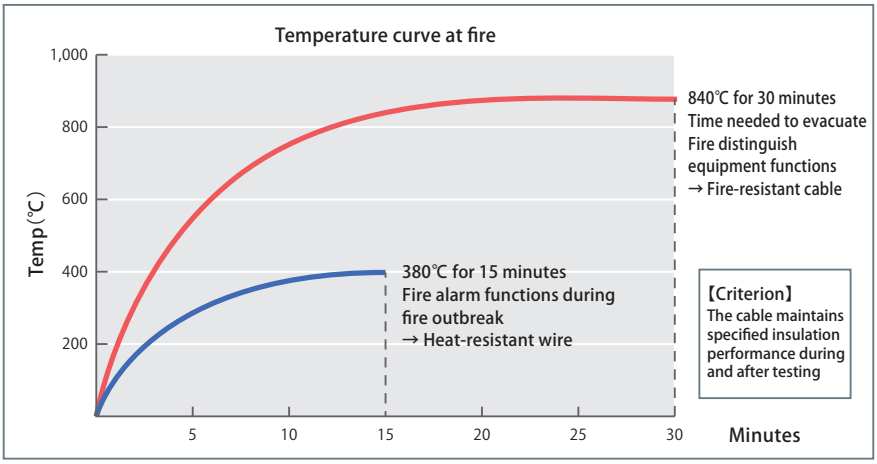
Development of New Fire-resistant Cable

Fujikura Dia Cable develops a fire-resistant cable for low-power circuits*1 to add the new product to its fire-resistant lineup. Currently, electric wires and cables to ensure that emergency broadcasts or emergency lumps remain turned on for a certain time include two types of heat-resistant electric wires and fire-resistant cables. Heat-resistant electric wires are mainly used in communication circuits for emergency broadcast systems, and fire-resistant cables in power supply circuits to turn on emergency lumps and pumps of fire extinguishers.

In recent years, communication circuits using heat-resistance wires also require easy-to-handle cables that have heat resistance (fire-resistance) equivalent to that of fire-resistance cables. The cable under development is a new fire-resistant cable to meet these requirements. This cable is designed with an insulator and sheath thickness for a low-power circuit based on fire-resistant cables of lower than 600 V. This enables the product to be used when a circuit needs performance better than a heat-resistant cable, but a low-voltage fire-resistant cable is not suited.

The standardization and certification system of a low-power circuits are currently being considered, and the product certification is going to be obtained upon the establishment of the system.

*1 Low-power circuit: circuit using maximum voltage of 60 V



● Figure: Heat conditions required for fire-resistant heat-resistant cable

Fujikura Dia Cable https://www.fujikura-dia.co.jp/contact/

Power & Telecom

Fujikura Releases World's Highest Density Indoor-Outdoor Fiber-optic Cable

Fujikura has released Indoor-Outdoor Wrapping Tube Cable™ (WTC™) that accommodates 6912 optical fibers, which is the world's highest fiber density cable for Indoor-Outdoor application.

In current years, an increasing number of datacenters are being constructed because of the spread of smartphones and tablets and developments in video distribution and Cloud services. However, the construction of datacenters, which manage networks with huge data traffic capacity, has the following challenges:

● **Installation of more optical fibers in limited space**

● **Reduction of initial costs by effectively using existing facilities**

The 6912-fiber WTC helps in solving such challenges. This cable consists of Fujikura's proprietary Spider Web Ribbon™ (SWR™), which wraps 12 fibers as a unit, and has enabled a small diameter of 34.5 mm and lightweight of 955 kg/km despite its ultra-high 6912 fiber count. In addition, the highly flexible cable offers the ease of routing in a limited space.

Moreover, as shown in the drawing of SWR fiber pitch structure below, SWR with 200 μm fiber has the same pitch between the fibers as SWR with 250 μm fiber. This allows not only the splicing of SWR with 200 μm fiber but also with conventionally-used 250 μm fiber ribbons, or with SWR with 250 μm fiber. Thus, users do not have to purchase a new fusion splicer dedicated to 200 μm fiber ribbons, which contributes to saving initial costs.

In addition, the newly released 6912F Indoor-Outdoor WTC has a weatherproof sheath for outdoor use and is also frame retardant and low-smoke producing to minimize human and physical damages in case of fire inside buildings. For indoor application, cables are usually designed in compliance with UL standard in the US and CPR standard (Construction Products Regulation) in EU, and each country sets different requirements. Because of this, customers who have bases abroad are facing challenges as below:

● **Increase in the types and number of purchased items resulting from product procurement system according to specifications in each region**

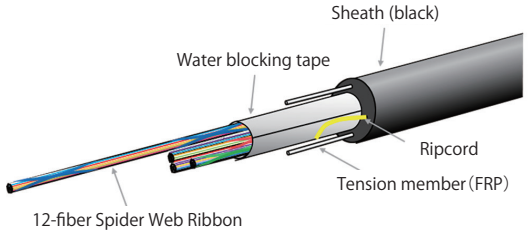
● **Complexities of inventory management because of products tailored to each region**

Fujikura's new Indoor-Outdoor WTC provides the most suitable solutions to these challenges.

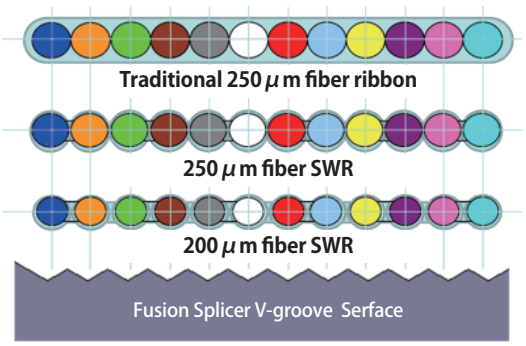
This WTC complies with both UL and CPR standards and thus can be deployed worldwide, helping efficient product procurement and inventory management.

Fujikura will continue to develop products that meet customer needs and contribute to the further development of the information and communication society.

● Structure



● SWR fiber pitch structure



● Specification

Application	Indoor and Outdoor
Number of fiber	6912
Outer diameter mm (approx.)	34.5
Weight kg/km (approx.)	955
Fiber diameter (μm)	200
UL standard	1666, 1685
CPR standard	Cca-s2, d0, a1*

*Cca-s2, d0, a1 indicates grades of CPR
Cca: Frame Retardancy, s2: Smoke Emission,
d0: Flaming Droplets, a1: Acidity

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R&D

Strong Magnetic Field Superconducting Magnet for 1.2 GHz High-resolution NMR Successfully Put into Use

Fujikura's High-temperature Superconducting Technology Contributes to the Accomplishment

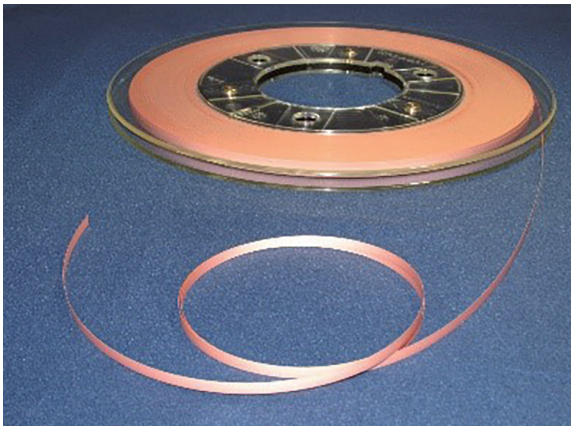
Fujikura and Bruker Corporation (hereafter Bruker), who have been collaborating in the field of superconductor technology, have reached major milestone.
A 1.2 GHz (28.2 T field strength) high-resolution ultra-high field (UHF) Nuclear Magnetic Resonance (NMR) magnet, whose high-field core was built from high-temperature superconducting materials developed and manufactured by Fujikura, has been successfully energized. A field of 28.2 T corresponds to a 1H resonance frequency of 1.2 GHz, which is the current world record in high-resolution NMR spectrometers.

Highlights

- Bruker is the world's leading supplier of NMR spectrometers, and has succeeded in developing high-resolution NMR system with the world's highest 1.2 GHz (28.2 T field strength) and already started using the product.
- Fujikura's rare-earth high-temperature superconducting wire material contributes to the commercialization of the 1.2 GHz NMR spectrometer
- UHF NMR is used for research on the SARS-CoV-2 virus, Alzheimer's and Parkinson's Diseases, as well as cancer, substantially benefitting society.

● Appearance of 1.2 GHz NMR developed by Bruker

Bruker is the world's leading supplier of NMR spectrometers, and has been historically pioneering the field of UHF NMR. NMR is a widely-used analysis technology in the fields such as precise analysis of chemical structure, quality management, material science, and structural biology.
In NMR, the samples to be investigated are placed in strong magnetic fields. Higher magnetic fields lead to higher resolution and higher signal-to-noise ratios in the NMR measurement. This is the reason why a very strong magnetic field is required. Until recently, only low-temperature superconducting materials were available for the commercial construction of such magnets, most notably Niobium-Titanium (NbTi) and Niobium-Tin (Nb3Sn). With such materials, due to their intrinsic properties, magnetic fields in excess of approximately 23.5 T (corresponding to a 1H resonance frequency of 1.0 GHz) cannot be achieved. However, high-temperature superconductors, such as the rare-earth barium copper oxides conductors manufactured by Fujikura, have helped break the barrier and make 1.1 and 1.2 GHz NMR spectrometers commercially available.



● Fujikura-made high-temperature superconducting wire material

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Information

Introduction to Next-generation Healthcare Management Solutions

FHRI (Fujikura Social Health Research Institute Ltd.) was established in April 2019, to promote healthcare management system (i.e., "Healthy Company") in the Fujikura group. Since 2013, HSG (Fujikura Health Strategy Group; FHRI's predecessor) developed and provided internal website exclusively for employees, ahead of other companies. The employees could check all the data such as their daily activity and exercise (e.g., steps), physical condition (e.g., weight and blood pressure) and results of the event participating in health promotion programs held by company (e.g., motor function examination and dental examination) by themselves. In this seven years, the value of health and lifestyle was dramatically changed not only for the employees but also in the society itself. Now, people seek a new style of participation to health promotion programs and connection among employees widely, as the next stage of healthcare.

In FHRI, we have developed new application which called "@Switch!" as the second stage of Fujikura Group Healthcare Management. This application is built as a platform to connect with all Fujikura group company, employees and their families together in the keyword of health, which will be released within the Fujikura Group in the summer of 2020. In "@Switch!", users can record their daily log such as physical activity data, daily meals and the record of medication even out of the office or factory. Also, this application include function similar to SNS; users can share their healthy activity with photos and some short comments by their nickname freely, and also users can be inspired new ideas from some other's activities without any loneliness. In this application, users can turn on their transformational "switch" in anytime and anywhere by themselves not only in the working time in the office. This is really innovative next-generation healthcare management solution.

In addition, we understand the importance of sensitive personal information (e.g., blood data) from the beginning of the establishment, so that we have managed the information security system and the personal information protection system. In this April, our information security management system was certificated by ISO (International Organization for Standardization): ISMS (ISO/IEC27001:2013, JIS Q27001:2014), which was the first certification in the Fujikura Group.

We suggest new ideas and solutions to empower resilience by any stimuli in the society by expanding new platform and various kinds of healthcare management programs; "Keep your energy, keep your mind and switch on your society".

● Handout to distribute within the group

MSA-IS-401 ISMS-AC ISMS ISR016

ISO/IEC27001:2013、JIS Q27001:2014: information security management system
Scope of certification registration: Healthcare of individual and organization in general (maintenance and enhancement of health, disease prevention, labor safety and hygiene, health management, prevention of presymptomatic disease)

※FHRI (Fujikura Social Health Research Institute Ltd.)

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