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Hitachi Metals, Ltd.

## Hitachi Metals Develops Medical Silicone Cable Excellent in Both High Sliding Properties and Chemical Resistance

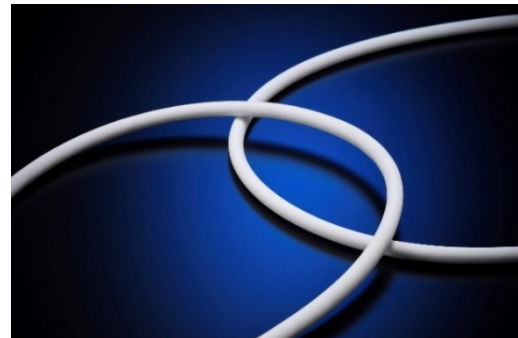
Hitachi Metals, Ltd. (hereinafter referred to as Hitachi Metals) has developed a new medical silicone cable that is excellent in both high sliding properties and chemical resistance, achieved by applying its proprietary surface treatment. The product has been mass-produced since the beginning of 2020 and has already been used in various medical devices. The surface tackiness of the cable, which is normally a disadvantage of silicone, has been improved to increase operability. We will promote adoption of the cable into medical devices that require frequent disinfection and sterilization, such as ultrasound diagnostic equipment, endoscopes, and catheters.

### 1. Background

Silicone, which is excellent in chemical resistance, sterilization resistance, and biocompatibility, has long been used as a material in medical devices. When applied to a sheath (protective outer layer), silicone has high tolerance to chemicals used for disinfecting the cable surface and is also applicable to high pressure steam sterilization (autoclaving). In view of such superior chemical and sterilization resistance properties, continuous application to a wide variety of medical devices can be expected. Furthermore, medical devices used for diagnosing patients with infectious diseases such as COVID-19 require frequent disinfection, which is expected to accelerate the adoption of silicone cables with excellent chemical resistance. Silicone cables, however, have long suffered from various disadvantages attributable to their surface tackiness, such as susceptibility of becoming dirty due to clinging dust, inferior handling by doctors, and inducing patient discomfort from skin contact.

### 2. Overview of the developed product

By applying our proprietary surface treatment on the skin of the medical silicone cable, we have resolved the silicone-specific problem of tackiness, achieving excellent sliding properties. With regard to reduction in sliding properties after repeated disinfection, thanks to the cable's surface structure which can withstand the stress of a nonwoven fabric impregnated with a disinfectant solution, we have obtained results in which sliding properties equal to or better than our PVC cables\*1 can be maintained even after 10,000 wipes (based on our evaluation method). We have also confirmed that the silicone cables have less discoloration than our PVC cables against various chemical solutions commonly used in hospitals. Mass-production of the cable commenced at the beginning of 2020. We have been responding to various requests for prototyping with regard to many different kinds of cables for medical device applications.



Medical silicone cable

In addition to promoting the adoption of this developed product for use in various medical devices, Hitachi Metals will continue to develop new wires and cables for medical devices and contribute to the evolution of advanced medicine.

#### ■ Properties of the developed product

Sliding properties	Coefficient of static friction: Less than 0.20*5
Wipe durability*2 (nonwoven fabric impregnated with a chemical solution*3)	Coefficient of static friction: Less than 0.22 (after performing wipe testing 10,000 times)*5
Chemical resistance*4	Almost no discoloration (color difference $\Delta E^*ab < 2.5^*5$ )
Biocompatibility	No cytotoxicity*5 (ISO 10993-5)

### 3. Patent

Patent granted

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- \*1 A PVC cable is a cable that employs polyvinyl chloride as the protective outer layer.
- \*2 Wipe durability: Wipe durability after 10,000 times using a nonwoven fabric impregnated with a chemical solution. Depending on the type of nonwoven fabric used for wiping and the chemical solution as well as the method of wiping, sliding properties may deteriorate.  
Nonwoven fabric impregnated with a chemical solution: Nonwoven fabric impregnated with ethanol for disinfection, Sani-Cloth®
- \*3 HB, Soflight™, etc.  
Sani-Cloth is registered trademark or trademark of PDI, Inc.  
Soflight is registered trademark or trademark of Asahi Kasei Advance Corporation.
- \*4 Chemical resistance: Ethanol for disinfection and many different disinfectants for medical devices
- \*5 This represents a test result, not a guaranteed performance standard.