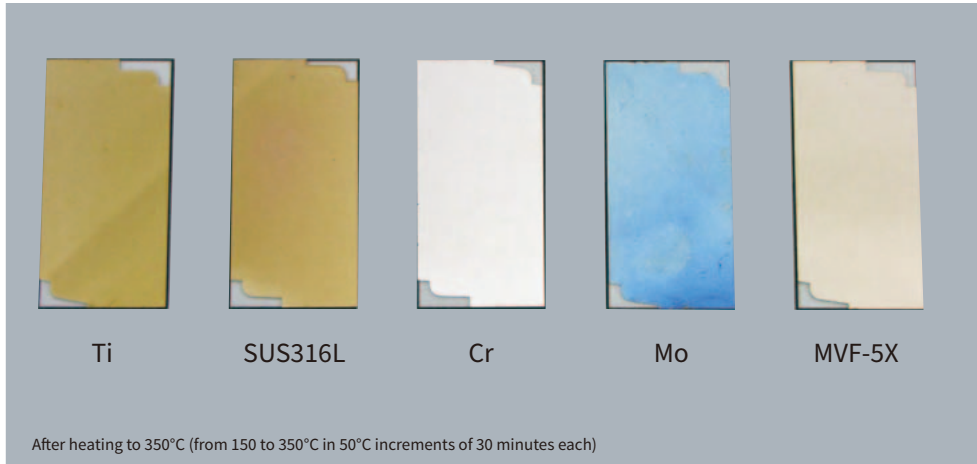


# High Functional Material



1 Metal films after heating in air (film thickness: 0.2 μm)

## 1 Target Material for Highly Corrosion-resistant Molybdenum Alloy Film Supporting Flexible Substrates

Hitachi Metals, Ltd. manufactures and sells target materials used for sputtering, a thin film production method. Demands for smaller, lighter, and higher-functionality electronic devices are resulting in production of thinner films, and in the future, there will also be demands for flexible films offering superior portability.

The company has developed a new target material for forming molybdenum alloy (MVF-5X) film. The material provides a number of properties to support multiple applications. It has the high corrosion resistance needed for the coming generation of high-functionality thin-film devices. It also has high adhesion and low stress on flexible substrates such as resin films, along with a thermal diffusivity barrier property when used with high-functionality films such as conductive or magnetic films.

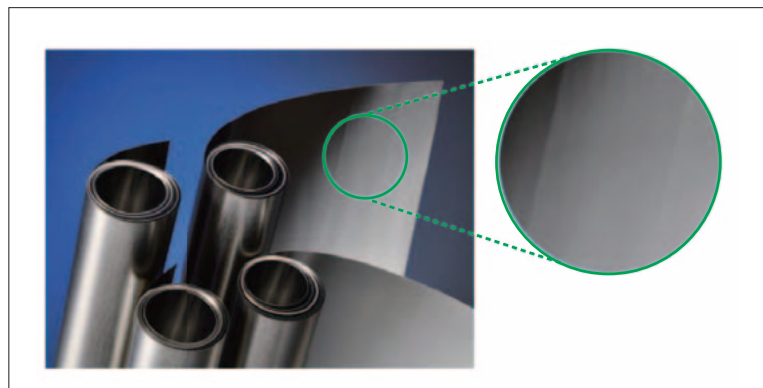
The new material has been released in applications such as the surface protection film (cap film) of copper wiring in liquid crystal displays (LCDs), and has been slated for mass-production by some customers. Hitachi Metals is promoting the material to customers and taking sample orders in anticipation of a switch to laminated thin films for

electronic parts currently being manufactured by powder sintering. The company is also working on releasing thin films made from the new material for applications in areas such as design. These thin films provide the same high optical reflection characteristic as chromium, along with oxidation resistance high enough to retain a metallic gloss in air at 350°C. (Hitachi Metals, Ltd.)

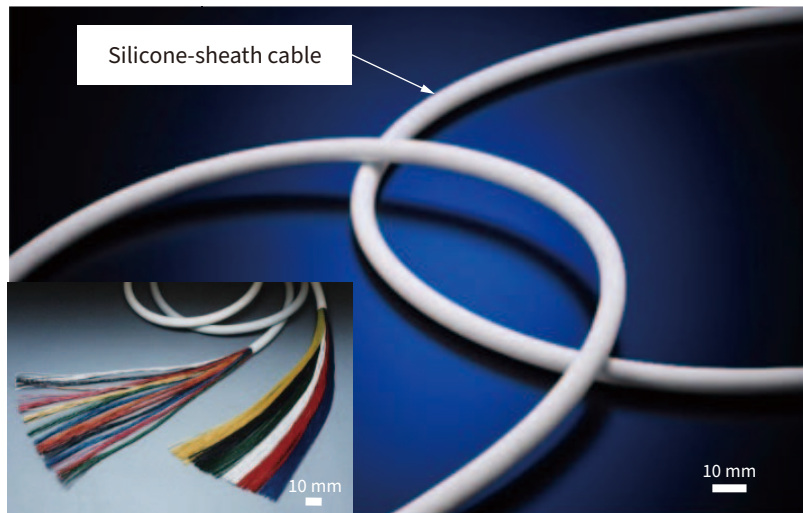
## 2 Magnetic Domain Controlled Low-loss Iron-based Amorphous Alloy Strips

Reduction of CO<sub>2</sub> emissions have been an urgent issue as a countermeasure against global warming.

With respect to power distribution transformers, energy efficiency standards in each country have become



2 Magnetic domain controlled iron-based amorphous alloy strips (nominal thickness: 25 μm, standard widths: 142, 170, and 213 mm)



**3** Medical silicone cable and cable for use in ultrasound diagnostic equipment

more strict and core materials for transformers with lower iron loss has been required to comply with these standards.

Hitachi Metals has been engaged in a magnetic domain control technique using laser scribing process for amorphous alloy strips which has been difficult to practical use and has developed magnetic domain controlled iron-based amorphous alloy strips with low iron loss suitable for commercial frequency ranges.

Iron losses of cores using this new type of amorphous alloy strips show lower core loss by more than 30% to those using conventional amorphous alloy strips and can greatly contribute to the high efficiency of the power distribution transformer.

(Hitachi Metals, Ltd.)

### **3 Highly Slick and Chemically Resistant Medical Silicone Cable**

Silicone is a widely used material in medical devices due to its outstanding chemical resistance, sterilization resistance, and biocompatibility. When used to make cable sheaths (protective outer layers), it is highly resistant to

the chemicals used to disinfect cable surfaces. It can also be used in high-pressure steam sterilizers (autoclaves). However, the stickiness of silicone surfaces gives them a number of issues. For example, they tend to gather dust and get dirty quickly. They are also not well suited to being handled by medical practitioners.

Hitachi Metals has developed a medical silicone cable that provides a very slick finish while still preserving silicone's outstanding chemical resistance, sterilization resistance, flexibility, and soil resistance.

The new cable creates a very slick finish from an original surface treatment applied to the cable covering that eliminates silicone's characteristic stickiness. The cable's surface structure resists the stress produced by contact from nonwoven fabric soaked in disinfectant, preventing loss of slickness from repeated disinfection. The material was found to maintain a slickness level at least as high as Hitachi Metals' medical polyvinyl chloride (PVC) cable even after 10,000 test wipes. The application of various hospital-use chemicals was also found to discolor the new cable less than PVC cables.

(Hitachi Metals, Ltd.)