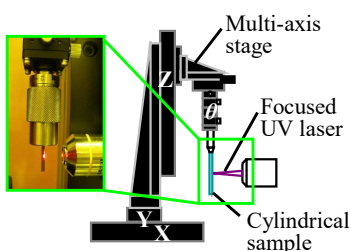


Photofabrication and mounting process on cylindrical structure

The medical tools inserted or implanted in the human body has many cylinder shapes, such as catheters, endoscopes, etc. Miniaturization, multifunctional capabilities, and high performance are required for these tools. We developed techniques to do micro-fabrication and mounting on cylindrical substances to meet these demands. The highly efficient micro medical tools are developed with thin diameter using this technology.

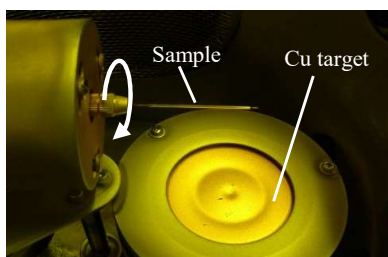
Photofabrication process

Exposure system



This system can expose photoresists on cylindrical shape by uniting laser with an automatic stage.

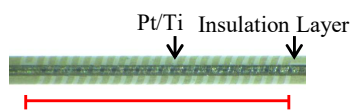
Sputtering system



This system can form thin metal film uniformly on cylindrical shape by rotating sample during sputter.

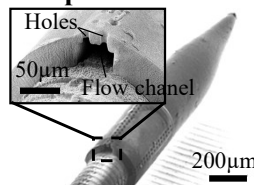
【Examples】

Needle with microheater



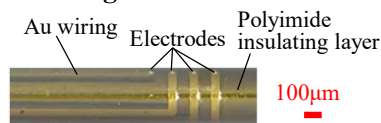
Pt-Ti micro heater was fabricated on acupuncture needle.

Microperfusion needle for subepidermal tissue



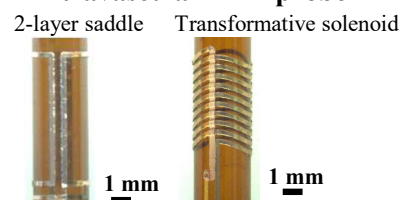
Flow channel with perforated membrane was fabricated on acupuncture needle.

Neural probe with working channel



Recording pad was fabricated on polyimide tube.

Intravascular MRI probe



MRI receive coil for the intraluminal application (for example, blood vessel).

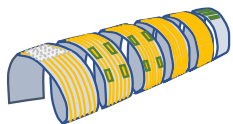
Mounting process

Mounting after coiling

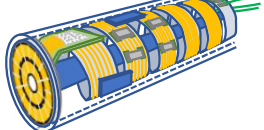
- (1) Patterning on LCP film



- (2) Coiling and heat treatment

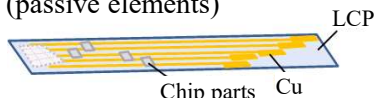


- (3) Mounting parts

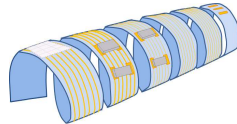


Coiling after mounting

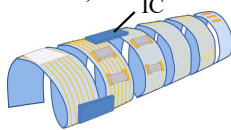
- (1) Mounting chip parts (passive elements)



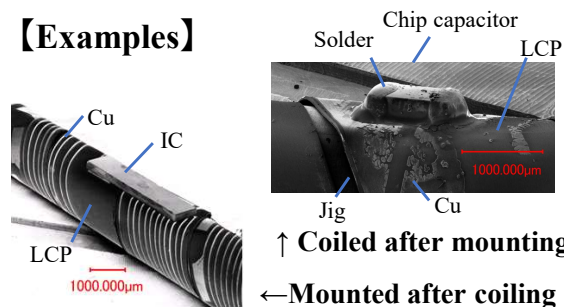
- (2) Coiling and heat treatment



- (3) Mounting IC (Integrated Circuit)



【Examples】

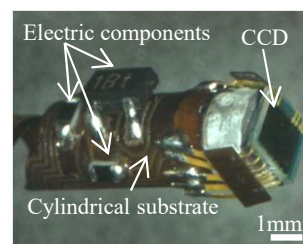


↑ Coiled after mounting

← Mounted after coiling

Direct mounting on cylindrical substrate

Active bending electric endoscope



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<References>

S. Goto *et al.*, Proc. Int. Conf. Microtech. Med. Biol., Okinawa, Japan, 2006, pp. 297–300.
T. Matsunaga *et al.*, Proc. of Japan Institute of Electronics Packaging, 2013, pp.262–265.