All Hands INRF/BiON Meeting

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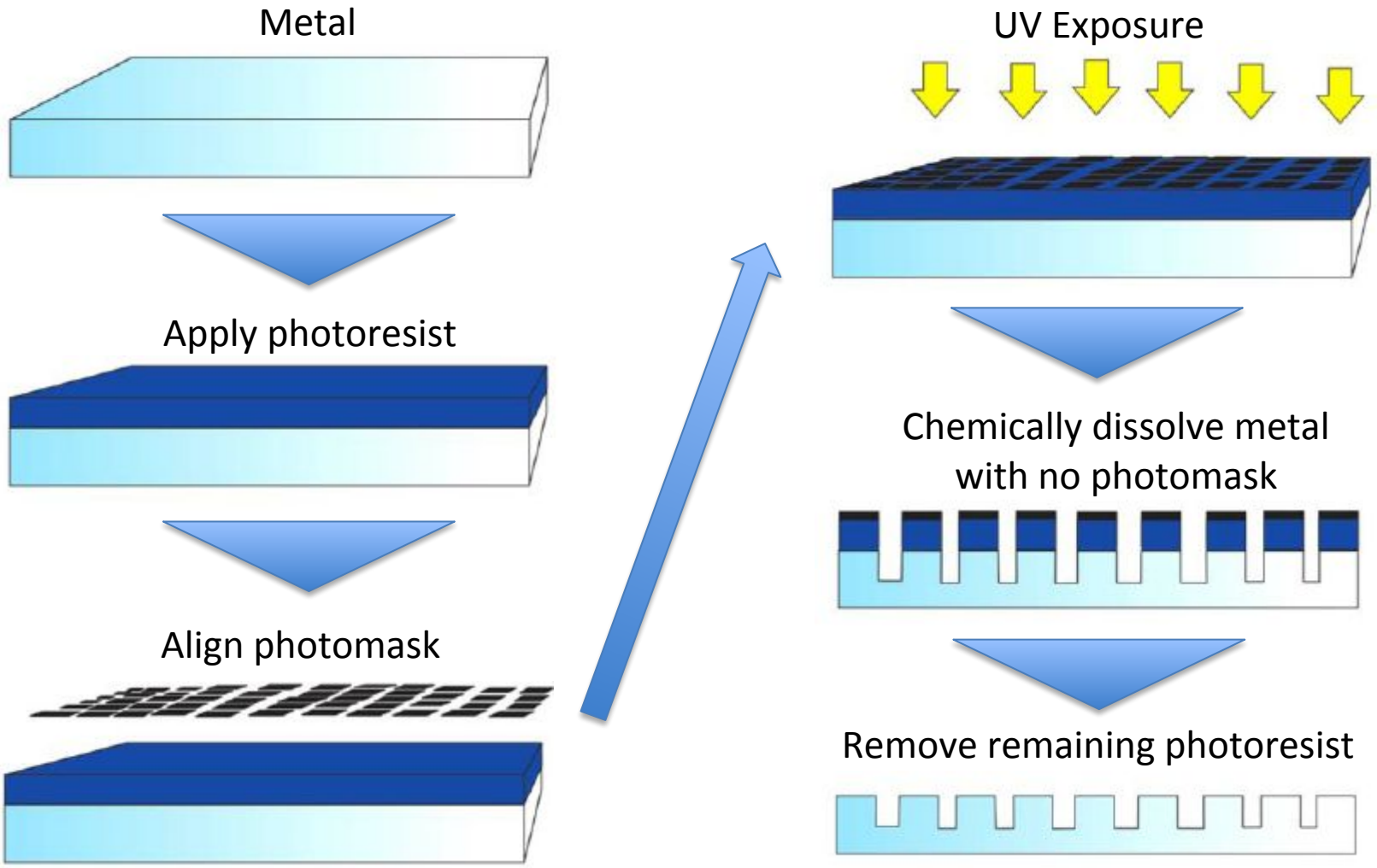
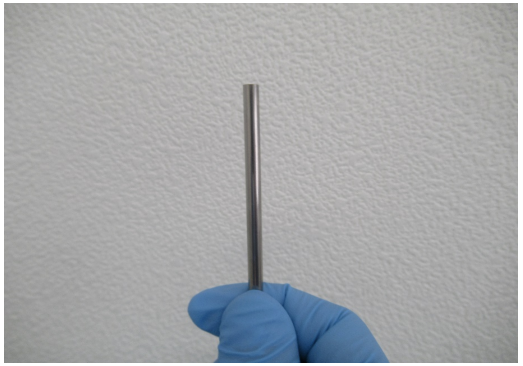
KYOSEI
ETCHING + ONE

Traditional Photoetching Overview

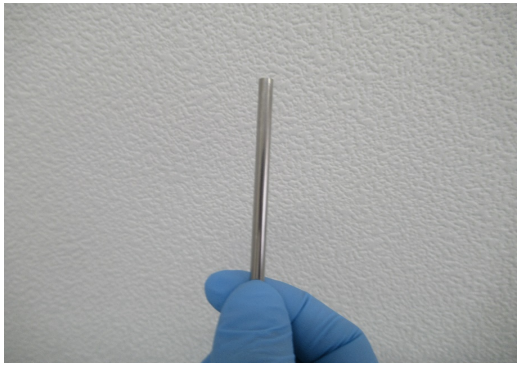


3D-Photoetching Process

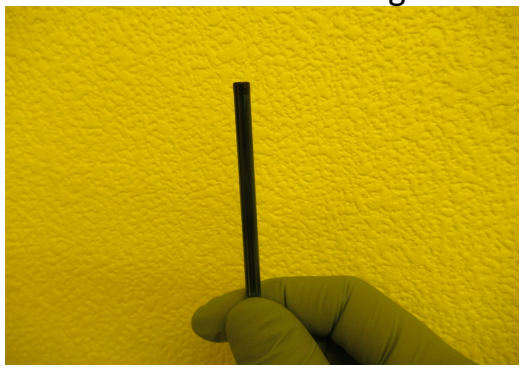
Raw Tube



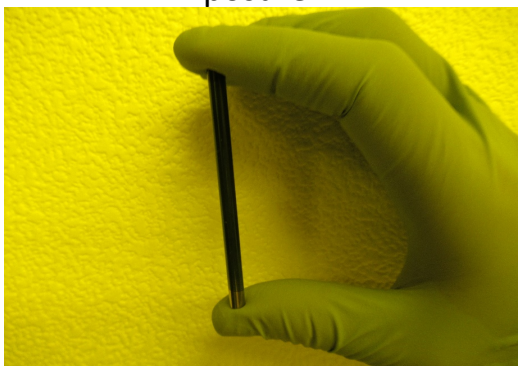
Clean Tube



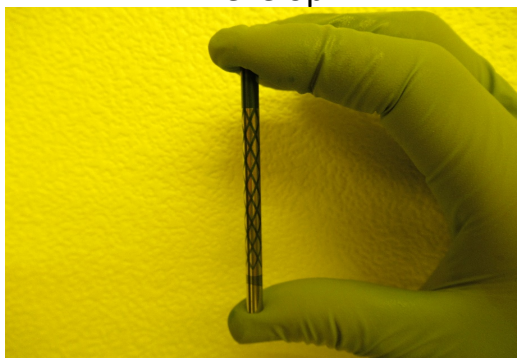
Photoresist Coating



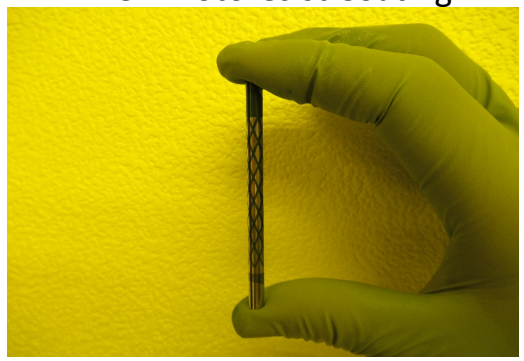
Exposure



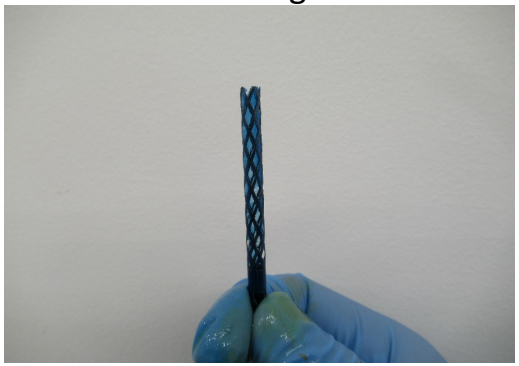
Develop



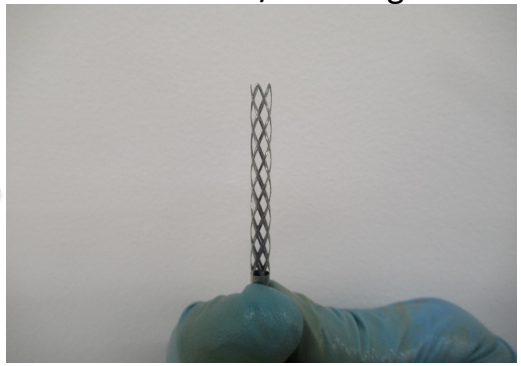
Inner Photoresist Coating



Etching



Removal/Cleaning



KYOSEI ETCHING + ONE

3D-Photoetching Overview

Kyosei original etching method

Our 3D-photoetching method follows the same principles as traditional etching, this means we are able to have a quick response time for changes in designs as the only requirement is a photomask.

There are a variety of applications, but the main focus at the moment are tubes. Kyosei has created many prototypes of stents and with the current manufacturing method being laser cutting, we hope 3D-photoetching will become an alternative option.

Kyosei has also found success in 3D-photoetching magnesium, a bio-absorbable material. Because of magnesium's low heat tolerance, it is a perfect match for photoetching technology.

3D-Photoetching Technical Information

Material	Stainless Steel & Magnesium	Cobalt Chrome & Nickel Titanium
Minimum Hole Size	0.10 mm	0.13 - 0.15 mm
Minimum Thickness	0.005 mm	0.0065 – 0.0075 mm
Maximum Thickness	0.10 mm	0.13 – 0.15 mm
Minimum Distance Between Holes	0.07 mm	0.09 – 0.11 mm
Minimum Pitch Distance	0.17 mm	0.22 – 0.26 mm
Minimum Device Length	100 mm (1 mm)	100 mm (1 mm)
Maximum Device Length	300 mm (2000 mm)	300 mm (2000 mm)
Minimum Diameter	0.08 mm	0.08 mm
Maximum Diameter	250 mm	250 mm

3D-Photoetching Advantages

Advantages	Description	Enablers
Material	**Stainless Steel, Mg & Ni-Ti** **Developing Co-Cr*	• Heatless procedure
Durability	Expected to be **stronger** than laser cut products	• Crack-less compared to heat affected zones in laser cutting
Integrity	High **smoothness**	• No dross • No burr
Downsizing	**80 micron** diameter tubes	• 3D-Etching
Cost	Expected to be more **cost effective** than laser cutting	• Can process more than 1 tube at a time

Kyosei & U.C. Irvine Partnership

Kyosei works with researchers and local professionals on finding ways to apply our technology to current or future projects.

UCI helps introduce Kyosei's technology and capabilities to their network of business professionals and organizations.

The partnership aims to be a symbiotic relationship that will allow for both organizations to grow and develop, while researching and innovating new methods of manufacturing precision components.