

# Additive Manufacturing Science Lab

[Niino Laboratory]

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Dept. of Precision Engineering

## 3D Printing and MID (Molded Interconnect Device)

**Functional Geometrically-shaped Parts Manufacturing Technologies: Additive Manufacturing Technology and Molded Interconnect Devices**

This lab aims to create newly functional device of mechanical and electrical combined as one. To do this, we emphasize on functional 3D geometrical shape made of combined material. In detail, we focus on Additive Manufacturing (AM) and Molded Interconnect Device (MID) and their application.



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## Our Projects

### Additive Manufacturing Study on fabrication process

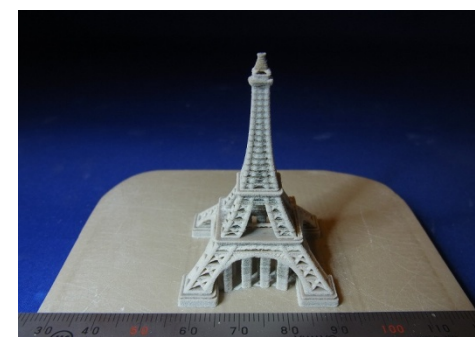
- Process Development in Laser Sintering Fabrication
- Laser Sintering process development for Super Engineering Plastics

### Application Study

- Laser Sintering Fabrication realizing High Porosity and Intensity
- Laser Sintering Fabrication of Tissue Engineering Scaffolds
- Application of Photonic Device using Laser Sintering Fabrication



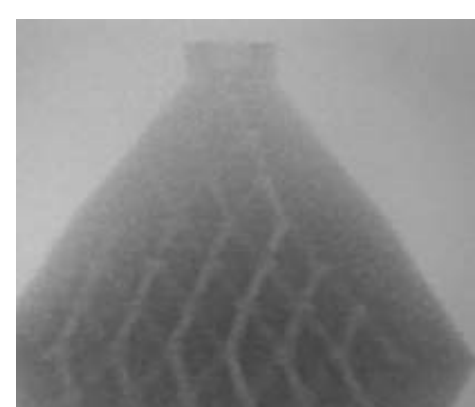
Preheat-free process



Eiffel tower using PEEK (High heat resistance plastic)



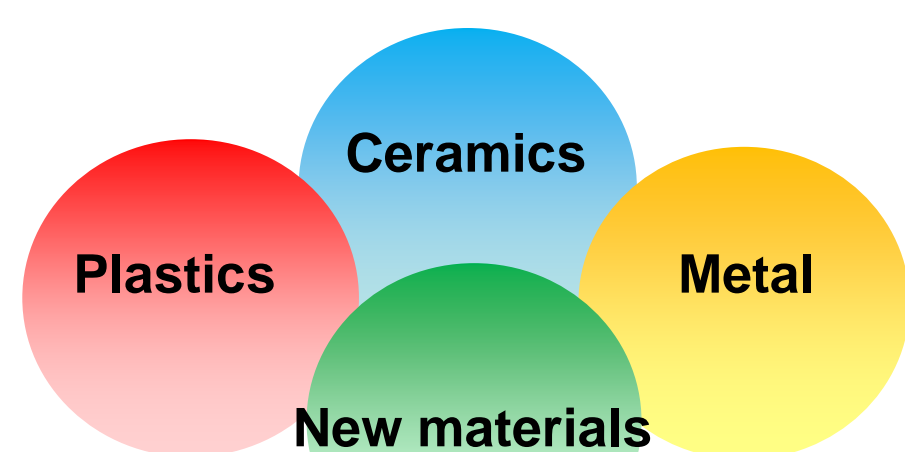
Microscopic object fabrication



CT scan of Scaffolds showing minute flow channels



Fabrication of Amorphous Structures (Photonic Fractal)



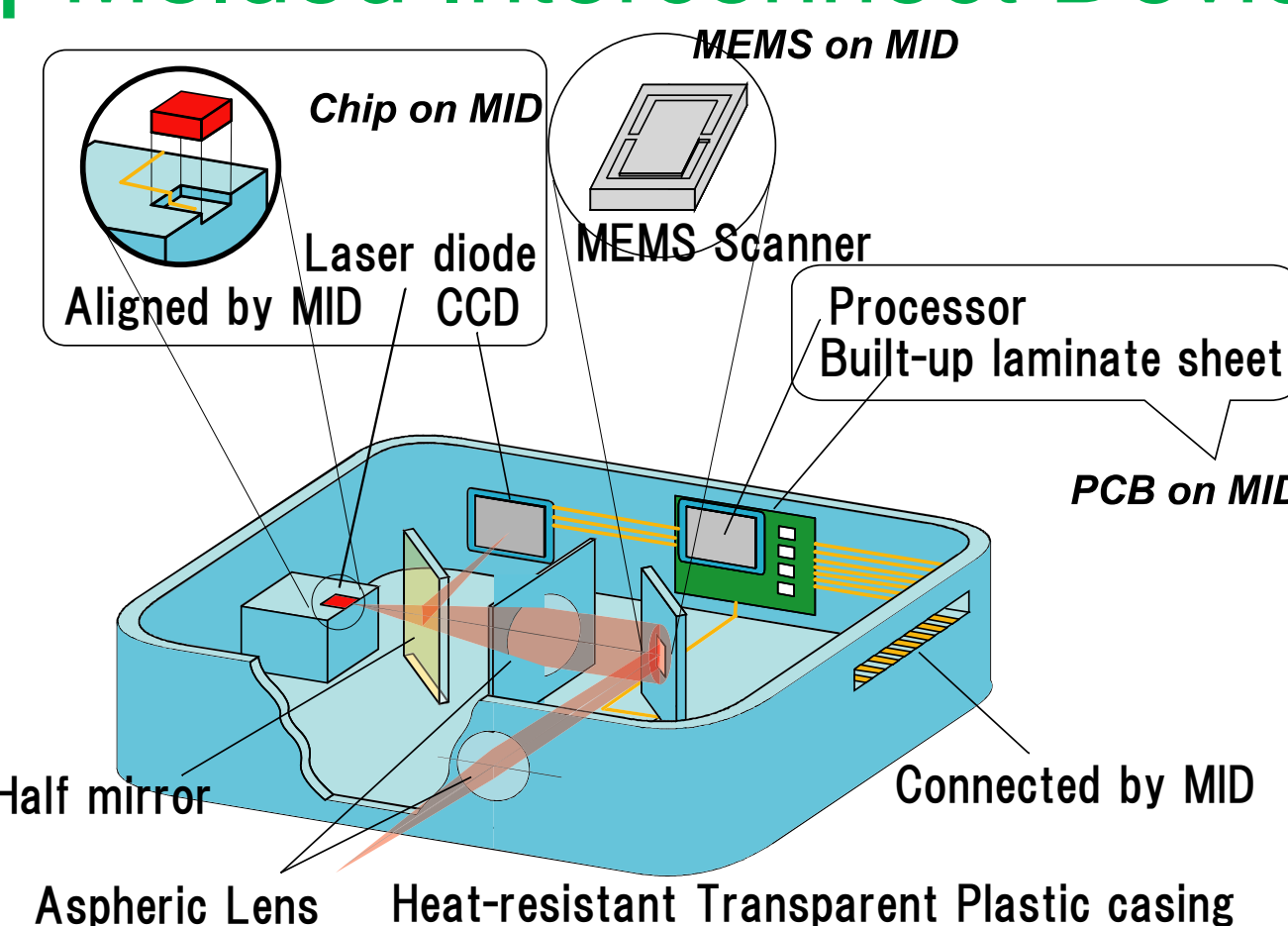
Arbitrary 3D  
Structure fabrication

AM

Circuit Patterning  
on arbitrary surface

MID

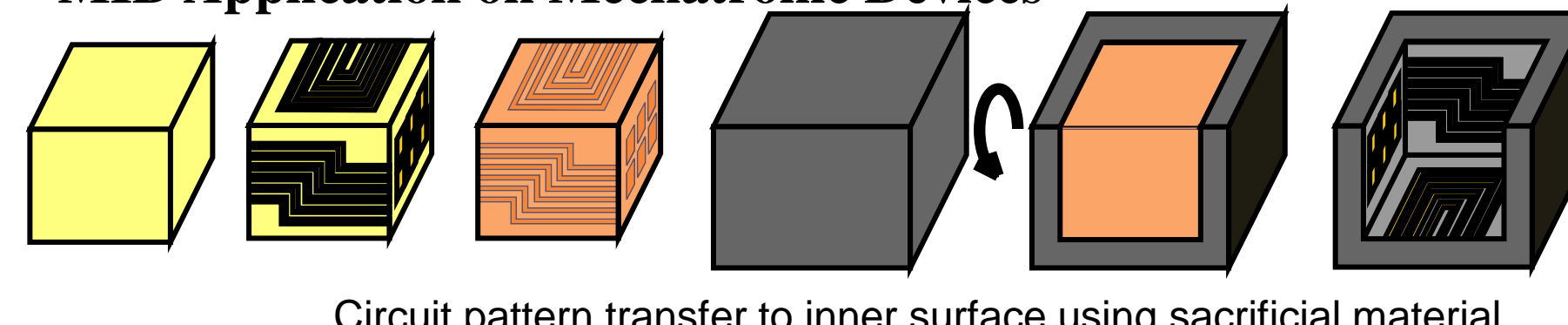
### MID | Molded Interconnect Device



### Study on fabrication process of MIDs

- MID fabrication process using sacrificial material

#### MID Application on Mechatronic Devices

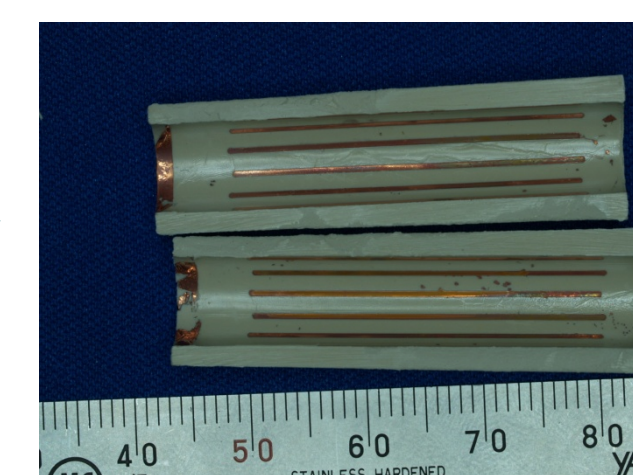


### Study on MID application

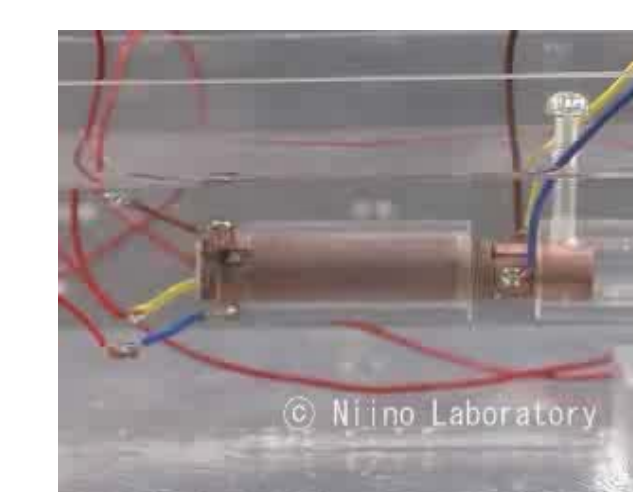
- Circuit pattern transfer to inner surface of objects using sacrificial material



Sacrificial material  
+  
Soft etching



- MID Application on Static Electric Motor.



Static Electric Motor using MID technology

- Injection Molded Functional Fluid Channel

