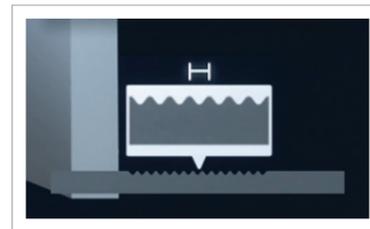
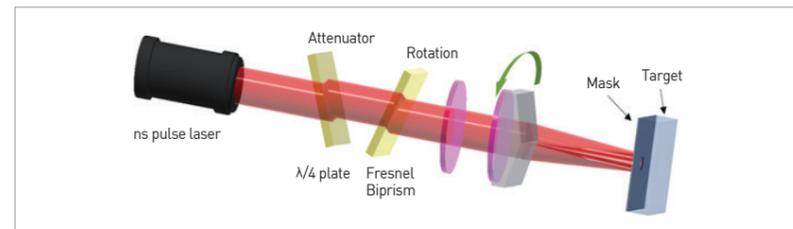


High-speed Large-area Micro Patterning Technology Using Pulse Laser Intervention

Dr. Jihwan Noh
Department of Laser & Electron Beam Application
T. +82 - 42 - 868 - 7915
E. njw733@kimm.re.kr

⇒ With the micro patterning technology using laser intervention, the technology enables direct machining on various materials including metal surface with pulse laser.



Client / Market

- Laser manufacturing equipment
- High-speed micro pattern maker users (e.g. anti-forgery pattern making, pattern making for catalyst contact area increase for fuel cell or solar cell)

Limitation of Existing Technology

- Existing focus type laser machining has limits regarding diffraction that machining of small patterns is difficult and the machining time is long due to stage moving, etc.
- Research on laser intervention machining is being conducted to overcome the problem of above focus type laser machining, however, the research is limited to continuous wave laser with excellent coherency that it can only be applied to a photosensitizer.
- Therefore, a high-speed micro patterning technology that can be directly applied for various materials-metal surface, in particular-is demanded.

Technical Differentiation

- Possible to perform one-shot patterning onto a large area-high-speed patterning with the speed of 5 n sec
- Possible to create micro patterns with the pattern pitch size between 1 and 20 μm
- Possible to perform patterning on all materials where the surface can be polished including metal surface

Excellence of Technology

- High-speed, large-area patterning technology is expected to shorten the processing time approximately up to 100 times compared to the existing method.

DESIRED PARTNERSHIP

Technology Transfer

Licensing

Joint Research

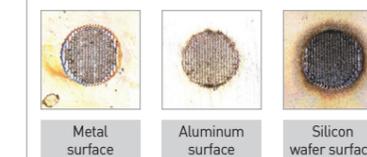
Other



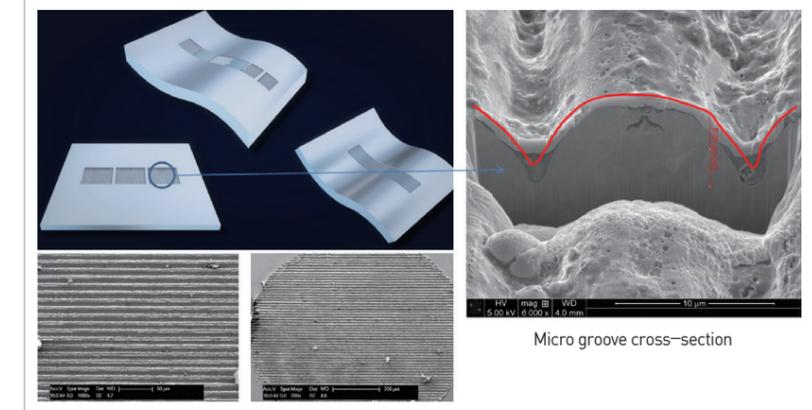
TECHNOLOGY READINESS LEVEL [TRL]

Research, basic explanation | Project concept or idea development | Technology idea verification | Prototype development | Trial product production/ evaluation in similar environment | Pilot field demonstration | Development and optimization of commercial model | Commercial product demonstration | Mass production and initial market launch

Direct Patterning on Various Materials



Micro Patterning of 1 to 20 μm on Flat or Curved Plate



- Possibility of creating very small line or dot patterns with the pattern pitch size between 1 and 20 μm has been confirmed.
- Pattern making with this technology on various materials including metal, aluminum, and silicon wafer surface has been verified.
- The optical system can be easily rotated that it can create a line pattern with different column direction continuously at a high speed.
- Patterns generated with this method can be matched according to the serial number to be used for anti-forgery.
- A repetitive pattern can be created on a roll or curve by using this technology.

Current Intellectual Property Right Status

PATENT

- Anti-forgery Pattern Generating Device (KR1764835)
- Anti-forgery Pattern Generating Device and Method (KR1688613)
- Anti-forgery Pattern Detection Device (KR1685617)
- Anti-forgery Pattern Detection Device and Method (KR1597754)
- Anti-forgery Pattern Generation Device and Method (KR1528345)

KNOW-HOW

- Synchronization technology for pulse laser, rotary optical system, etc.
- Pattern commissure precision machining technology