Micro Milling–applied Surface Texturing Module Technology

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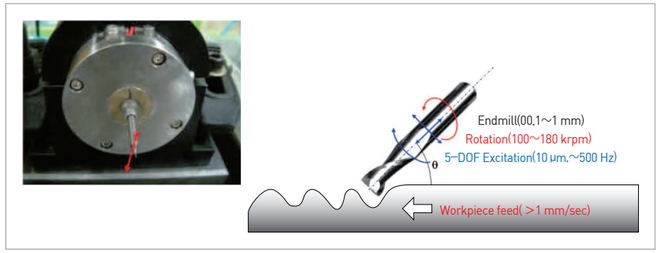
Device and module for surface texturing using micro milling, etc.



Client / Market

- Micro die and molds, ultra–precision machining system and components market

Necessity of this Technology

- Micropattern generation and texturing using cutting with a non–rotating tool has limits regarding its form and processing direction; using milling/grinding for texturing through feed control of the machine tool takes a long time and is ineffective.

Technical Differentiation

- Texturing using milling does not limit machining direction; shorten processing time.
- Possible to generate various patterns using ball end mills and various tools
- Possible to apply various materials using micro milling
- Possible to generate patterns on a relatively large area using the grinding with pre–patterned wheels
- Texturing using milling module that allows 5–DOF vibration displacement during rotation
- Micro machining using micro–patterned grinding wheels

Excellence of Technology

- Existing micro milling–applied dimple processing cannot realize spherical patterns.
- With this technology, repeated generation of spherical dimples expected to become possible by synchronizing the work feeding speed.

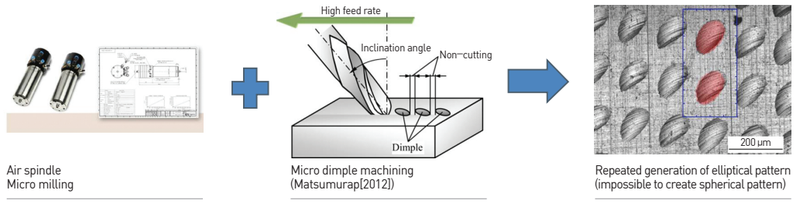
DESIRED PARTNERSHIP

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

Micro Milling–applied Pattern Processing (Existing Research)



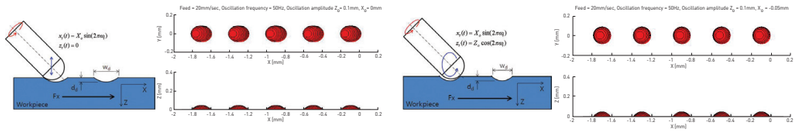
Air spindle
Micro milling

Micro dimple machining
(Matsumurap[2012])

Repeated generation of elliptical pattern
(impossible to create spherical pattern)

Interpretation of Oscillation Micro Milling–applied Dimple Machining (Proposed Method)

Interpretation of pattern generated with oscillation milling using 0.2 mm ball end mill



Linear oscillation → Elliptical pattern

Elliptical oscillation → Spherical pattern

Dimple spacing and size can be adjusted following oscillation frequency, speed, and displacement

Current Intellectual Property Right Status

PATENT

- Apparatus for Micro Surface Texturing Machining and Its Method (KR1463803)
- Grinding Apparatus for Surface Texturing and the Grinding Method thereof (KR1400876)
- Apparatus for Micro Surface Texturing (KR1476815)