

Special Issue on High Performance Abrasive Technologies

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The demand for high-precision abrasive processes for difficult-to-machine materials, such as hardened steel, ceramics, Ti alloys, and CFRP, has increased in various industries, such as in the automotive, airplane, optical, and communication industries, as well as in the life and medical sciences. Some difficult-to-machine materials can be reliably machined using deterministic precision-cutting processes. On the other hand, hard and brittle materials, such as ceramics, carbides, the hardened steel of molds, glassy materials, or semiconductor materials, have to be machined using precision abrasive technologies with super abrasives of diamond or cBN. However, the machining of high-precision components and their molds/dies by means of abrasive processes is much more difficult because the complex and non-deterministic natures and textured surfaces of these materials. In this sense, precision grinding and polishing processes are primarily used to generate high-quality, functional components usually made of difficult-to-machine materials. The surface qualities achievable through precision grinding and polishing processes become more important in terms of reducing machining times and costs.

This special issue covers high-performance abrasive technologies; including grinding, lapping, polishing, and jet polishing; energy-assisted abrasive technologies; magnetic machining technologies; and vibration-assisted technologies.

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Number of pages: 8 pages (but no limit)

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Submission Deadline: **May 31, 2021**

Publication: January 5, 2022 (Vol.16 No.1)

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Publisher: Fuji Technology Press Ltd. Inquiry: auto@fujipress.jp

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