Preface

The history of abrasive technology originates from the discovery of minerals and continues with the development of precision technology. Currently, the requirements for high precision and high quality surfaces for precision components and devices, such as silicon wafers in the semiconductor industry, optical lenses in the precision instrument industry, and dies in the injection molding industry, make abrasive technology more important than ever, and necessary for the rapid development of information technology. At the same time, high removal rate abrasive processes are helping to improve productivity in more traditional industries, such as automotive and aerospace.


The topics include mechanics of grinding processes, grinding and cutting for brittle materials, precision and surface quality enhancement, grinding wheels, cooling and coolant, advances in truing and dressing for grinding, polishing, micro machining, novel abrasive techniques, and novel machining techniques. For these topics, novel designs in systems and machine tools, novel techniques, and processes are reported. Modeling and characterizations on the characteristics and performances of abrasive processes are also presented.

In total, 97 papers were contributed from countries and regions around the world, including Japan, China, UK, Korea, Germany, Australia, Singapore, Taiwan (China), Hong Kong (China), and USA. The selection of papers for inclusion in this book was based on the recommendations from the preliminary review of abstracts and from the final review of full length papers, with both reviews concentrating on originality and quality. While emphasizing the practical techniques to improve quality and efficiency, theoretical examinations of abrasive processes and systems are also considered.

We believe that the book will present the newest applicable information for active researchers and engineers, and form a basis for further research in the abrasive technology field to create new and practical machine tools, systems, and processes, and to identify new characteristics for them.

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