Preface

Abrasive technology concerns the manufacturing processes that involve the use of abrasives in a variety of forms. It has a long history originating from the discovery of minerals. With the increasing requirements for the production of high precision and high surface quality components in various applications, spanning from nanoscale elements to large equipment and from biomedical devices to aerospace structures, abrasive technology is becoming increasingly important in precision manufacturing. An understanding of the mechanisms of abrasive technology enables to ensure the soundness and good integrity of components manufactured as well as to effectively develop new techniques.

This book attempts to collect the latest development and applications in abrasive technology. It contains selected papers from the submissions from around the world through a rigorous peer-review process. The topics covered include grinding and grinding wheels, truing and dressing techniques for grinding wheels, finishing, lapping, honing and polishing, abrasive jet machining, advances in machining technologies, micro/nano-fabrication, as well as other novel technologies and advanced studies relevant to abrasive technology and precision manufacturing.

The Editors believe that this book provides a valuable reference for professionals in the precision manufacturing field who wish to keep abreast with the state-of-the-art development in abrasive technology and who are interested to further understand the fundamentals in this discipline.

The Editors would like to express their sincere appreciation to all the authors for their contributions to this book and all the reviewers for their dedication to bringing this book to such a high quality. Thanks are also due to the members of the Organizing Committee for their help in putting the book together.

The Editors
June 2012
Co-organised by
National University of Singapore (NUS), Singapore
Nanyang Technological University (NTU), Singapore
Singapore Institute of Manufacturing Technology (SIMTech), Singapore
The University of New South Wales (UNSW), Australia
Shandong University (SDU), China

Sponsored by
International Committee for Abrasive Technology (ICAT)
The Japan Society for Abrasive Technology (JSAT)

Conference Chairman
Y.F. Zhang, National University of Singapore, Singapore

Conference Co-Chairmen
D.L. Butler, Nanyang Technological University, Singapore
X.P. Li, National University of Singapore, Singapore
T. Kuriyagawa, Tohoku University, Japan
J. Wang, The University of New South Wales, Australia

Organizing Committee
Chairman
Y.F. Zhang, National University of Singapore, Singapore

Co-Chairmen
D.L. Butler, Nanyang Technological University, Singapore
X.P. Xu, Huaqiao University, China
L. Zhou, Ibaraki University, Japan

Members
J.Y.H. Fuh, National University of Singapore, Singapore
K.S. Lee, National University of Singapore, Singapore
W.F. Lu, National University of Singapore, Singapore
C.G. Quan, National University of Singapore, Singapore
K.Q. Shen, National University of Singapore, Singapore
H.L. Liu, Shandong University, Mainland China
J. Zhou, Shandong University, Mainland China
C.S. Leo, Nanyang Technological University, Singapore
S. Subbiah, Nanyang Technological University, Singapore
K.S. Woon, SIMTech, Singapore

Scientific Committee (Including ICAT members)
Chairman
D.L. Butler, Nanyang Technological University, Singapore

Co-Chairman
S.C. Salmon, Next Generation Technology Group Inc. USA

Members
J.P. Davim, University of Aveiro, Portugal
H.J. Du, Nanyang Technological University, Singapore
F.Z. Fang, Tianjin University, Mainland China
W. Gao, Tohoku University, Japan
P.Q. Ge, Shandong University, Mainland China
Z.N. Guo, Guangdong Univ of Technology, Mainland China
M. Jackson, Saint-Gobain Abrasives, USA
W.B. Lee, Hong Kong Polytechnic University, Hong Kong
J.F. Li, Shandong University, Mainland China
S. Liang, Georgia Institute of Technology, USA
Z.Q. Liu, Shandong University, Mainland China
P. Mathew, The University of New South Wales, Australia
S. Melkote, Georgia Institute of Technology, USA
Y.M. Rong, Worcester Polytechnic Institute, USA
A. Shih, University of Michigan, USA
K. (Subbu) Subramanian, Saint-Gobain Abrasives, USA
J. Sung, Kinik Taiwan, Taiwan
Q.S. Yan, Guangdong Univ. of Technology, Mainland China
H.Y. Zheng, Singapore Institute of Manufacturing Technology
Z.X. Zhou, Hunan University, Mainland China
J. Zhao, Shandong University, Mainland China

ICAT Members (*Founding member)
Chairman
J. Wang*, The University of New South Wales, Australia

Vice Chairman
S.C. Salmon*, Next Generation Technology Group, USA
A. Yui, National Defense Academy, Japan

Secretariat
L. Zhou*, Ibaraki University, Japan

Emeritus Chairman
K. Suzuki*, Nippon Institute of Technology, Japan

Immediate Past Chairman
T. Kuriyagawa*, Tohoku University, Japan

ICAT Board Ordinary Members
T. Tawakoli, Hochschule Furtwangen University, Germany
X.P. Xu*, Huaqiao University, Mainland China

ICAT Active Members
H. Aoyama, Keio University, Japan
E. Brinksmeier, IWT, University of Bremen, Germany
D.L. Butler, Nanyang Technological University, Singapore
C.L. Chao, Tam-Kang University, Taiwan