Editorial

Jiwang Yan

Graduate School of Engineering,
Department of Nanomechanics,
Tohoku University, Aramaki Aoba 6-6-01,
Aoba-ku, Sendai 980-8579, Japan
E-mail: yanjw@pm.mech.tohoku.ac.jp

J. Paulo Davim

Department of Mechanical Engineering,
University of Aveiro,
Campus Santiago, 3810-193 Aveiro, Portugal
E-mail: pdavim@ua.pt

Biographical notes: Jiwang Yan is an Associate Professor in the Department of Nanomechanics, Tohoku University, Japan. His research interests include ultraprecision machining of optical and optoelectronic materials, design and fabrication of nano-structural surfaces, micro/nano-machining mechanics, laser processing of crystalline materials and semiconductors, and precision tooling technology using diamond and diamond-related materials. He has published six invited book chapters and over 100 technical papers in scientific journals and conference proceedings. He has received 12 awards from academic societies, international conferences and scientific foundations. He is currently conducting a number of research projects supported by industry and national organisations.

J. Paulo Davim received a PhD in Mechanical Engineering from University of Porto and the Aggregation from the University of Coimbra. During ten years, he has a Lecturer in University of Porto. Currently, he is Auxiliary Professor with Aggregation in University of Aveiro, Portugal. He has more than 20 years of teaching and research experience in Mechanical Engineering. He is Editor-in-Chief of two international journals. He is Guest Editor, Reviewer, Member of Editorial Board and an Advisory for many international journals. He has also published more than 200 papers in refereed international journals and conferences. His research activities are in tribology/surface engineering and machining/manufacturing.

Diamond has the highest hardness among the substances and is excellent in thermal conductivity and physical/chemical stability. Because of these unique characteristics, diamond is an excellent tool material for high-performance machining technologies. According to the microstructures and production methods, diamond materials used for cutting tools can be divided into a few categories such as Single-Crystal Diamond (SCD), sintered Polycrystalline Diamond (PCD), Chemical Vapour-Deposited (CVD) diamond, and diamond thin films. The diamond and diamond-coated tools have been used for

machining various engineering materials such as metals, ceramics, semiconductors, organic materials and composite materials. Therefore, the research and development of diamond and diamond-coated tools has become an important issue for the manufacturing industries.

The purpose of this special issue on 'Diamond and Diamond-Coated Tools for Machining Precision Surfaces' of *International Journal of Surface Science and Engineering (IJSurfSE)* is to provide a forum for researchers and engineers to review recent advances in design, fabrication, evaluation, application and machining performances of the diamond and diamond-coated tools, and to identify possible research directions in future.

After the peer-review processes, eight papers were finally selected for inclusion in the special issue, in which the third, fifth and seventh papers are literature reviews and the other papers are original contributions. The first three papers in this issue provide novel fabrication methods of diamond tools for precision micro-machining technology. The fourth paper is focused on fundamental investigations of machining mechanism of hard brittle materials using specially designed diamond tools and the tool wear characteristics during machining. The following three papers deal with recent advances in diamond coating technology, namely CVD coatings and Diamond-Like Carbon (DLC) coatings. The last paper of this issue is focused on the nano-level on-machine measurement of curved diamond tools for ultraprecision machining of aspherical surfaces and microgrooves. These papers cover a broad area ranging from developments and applications at the shop level to scientific investigations at the academic level. We hope this special issue is timely in delivering the latest achievements and also hope that it can stimulate more research interests in this area.

As the guest editors, we take this opportunity to thank all the authors for the time and effort they spent in preparing their papers and revising their manuscripts according to the referees' comments. We express our gratitude to the referees who reviewed the papers and made valuable comments. Finally, Professor J.P. Davim wishes to thank the Foundation for Science and Technology (FCT) in Portugal for the support of the project POCTI/EME/61676/2004.