



Serbian Tribology Society



Faculty of Engineering
University of Kragujevac

SERBIATRIB '13

13th International Conference on Tribology

15 – 17 May 2013, Kragujevac, Serbia

PROCEEDINGS





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EDITORS: Miroslav Babić, Slobodan Mitrović



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Preface

The International Conference on Tribology – SERBIATRIB, is traditionally organized by the Serbian Tribology Society every two years, since 1989. The previous conferences were held in Kragujevac (1989, 1991, 1993, 1999, 2005, 2007 and 2011), Herceg Novi (1995), Kopaonik (1997), Belgrade (2001, 2003 and 2009). This year the 13th International Conference on Tribology – SERBIATRIB '13 also takes place on May 15-17, 2013 in Kragujevac.

This Conference is organized by the Serbian Tribology Society (STS) and the University of Kragujevac, Faculty of Engineering. Organizing Scientific Conferences, STS plays a significant role in helping engineers and researchers to introduce in the fundamentals of tribology and to present their experience, solutions and research results.

The scope of the 13th International Conference on Tribology – SERBIATRIB '13 embraces the state of art and future trends in tribology research and application. The following two aspects of tribology practice require special attention. Firstly, the requirement for higher productivity of machinery means that machines must operate under higher loads and at higher speeds and temperatures, and that is why finding the right solutions for tribological processes is extremely important. Secondly, the good tribology knowledge can greatly contribute to the saving of material and energy.

The Conference program generally includes the following topics: fundamentals of friction and wear; tribological properties of solid materials; surface engineering and coating tribology; lubricants and lubrication; tribotesting and tribosystem monitoring; tribology in machine elements; tribology in manufacturing processes; tribology in transportation engineering; design and calculation of tribocontacts; sealing tribology; biotribology; nano and microtribology and other topics related to tribology.

All together 76 papers of authors from 18 countries (Taiwan, Russia, Belarus, Ukraine, Germany, Poland, India, Pakistan, Nigeria, Slovenia, Croatia, Bosnia and Herzegovina, Italy, Romania, Bulgaria, Greece, Turkey and Serbia) are published in the Proceedings. Approximately 37 papers were submitted by the foreign authors and app. 39 papers by the Serbian authors. All papers are classified into five chapters:

- Plenary lectures (4)
- Tribological properties of materials and coatings (29)
- Tribology in machine elements (23)
- Tribometry (13)
- Trenje, habanje i podmazivanje (7) – papers written in Serbian language

It was a great pleasure for us to organize this Conference and we hope that the Conference, bringing together specialists, research scientists and industrial technologists, and Proceedings will stimulate new ideas and concepts, promoting further advances in the field of tribology. The

Editors would like to thank the Scientific and the Organizing Committee and all those who have helped in making the Conference better. We would like to thank especially prof. Miroslav Babić and prof. Branko Ivković for the helpful suggestions and support.

The Conference is financially supported by the Ministry of Education, Science and Technological Development, Republic of Serbia.

We wish to all participants a pleasant stay in Kragujevac and we are looking forward to seeing you all together at the 14th International Conference on Tribology – SERBIATRIB '15.

Kragujevac, May 2013

Editors