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Journal of the Balkan Tribological Association is an International Journal edited by the Balkan Tribological Association for rapid scientific and other information, covering all aspects of the processes included in overall tribology, tribomechanics, tribochemistry and tribology.

The Journal is referring in Chem. Abstr. and RJCH (Russia).

Aims and Scope

The decision for editing and printing of the current journal was taken on Balkantrib'93, Sofia, October, 1993 during the Round Table discussion of the representatives of the Balkan countries: Bulgaria, Greece, Former Yugoslavian Republic of Macedonia, Romania, Turkey and Yugoslavia. The Journal of the Balkan Tribological Association is dedicated to the fundamental and technological research of the third principle in nature – the contacts. The journal will act as international focus for contacts between the specialists working in fundamental and practical areas of tribology.

The main topics and examples of the scientific areas of interest to the Journal are:

- (a) overall tribology, fundamentals of friction and wear, interdisciplinary aspects of tribology;
- (b) tribotechnics and tribomechanics; friction, abrasive wear, adhesion, cavitation, corrosion, computer simulation, design and calculation of tribosystems, vibration phenomena, mechanical contacts in gaseous, liquid and solid phase, technological tribological processes, coating tribology, nano- and microtribology;
- (c) tribochemistry – defects in solid bodies, tribochemical emissions, triboluminescence, tribochemiluminescence, technological tribochemistry; composite materials, polymeric materials in mechanics and tribology; special materials in military and space technologies, kinetics, thermodynamics and mechanism of tribochemical processes;
- (d) sealing tribology;
- (e) biotribology – biological tribology, tribophysiotherapy, tribological wear, biological tribotechnology, etc.;
- (f) lubrication – solid, semi-liquid lubricants, additives for oils and lubricants, surface phenomena, wear in the presence of lubricants; lubricity of fuels; boundary lubrication;
- (g) ecological tribology; the role of tribology in the sustainable development of technology; tribology of manufacturing processes; of machine elements; in transportation engineering;
- (h) management and organisation of the production; machinery breakdown; oil monitoring;
- (i) European legislation in the field of tribotechnics and lubricating oils; tribotesting and tribosystem monitoring;
- (j) educational problems in tribology, lubricating oils, fuels and contacts;
- (k) contacts – mechanical, agricultural, chemical, medical, social environments.

The Journal of the Balkan Tribological Association is indexed and abstracted in the Science Citation Index Expanded (SciSearch®) and Journal Citation Reports, Science Edition, Thomson Scientific, and in Elsevier Bibliographic Database (<http://www.info.scopus.com/detail/what/publishers/>). The impact factor is 0.321 in the 'Chemistry' subject category of the Journal Citation Reports® (JCR) for 2013.

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INSTRUCTION TO AUTHORS

The language of the Journal of the Balkan Tribological Association is exclusively English. Contribution will be considered only if they have not been and are not to be published elsewhere.

Manuscripts must be submitted in triplicate, typewritten and double spaced with 50 letters per line and 25 lines per page. Manuscripts in electronic form PDF are not accepted. Receipt of a contribution for consideration will be acknowledged immediately by the Editorial Office. The acknowledgement will indicate the paper reference number assigned to the contribution. Authors are particularly asked to quote this number on all subsequent correspondence.

The manuscripts are subjected to preliminary evaluation by the Editorial Board, and after selecting and receiving the referees consent they are forwarded to the appointed referees. The period for evaluation is one month. In case of negative report, the manuscripts are processed to other referees.

The Editorial Board announces that from 01.07.2014 introduces obligatory a fee of 100 Euro per one research article in JBTA for authors, whose Institutions, to which they belong, have no subscription to the Journal or their Tribological Associations have not paid the sponsorship fee, for the corresponding year. The introduction of this payment is imposed by the financial difficulties of the Editorial Board enforced by the financial crisis. The authors can publish their manuscripts as rapid publication (6 months after the receipt of the positive referees comments and the revised version) after they pay a fee of 60 €. Part of the papers can be published in colours, in order to make it more understandable for the reader. The additional payment is 75 € per printed page.

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The title page should include the title, the authors and their affiliations, and the complete address to whom correspondence should be sent. There is included the running title and the keywords according to the authors.

Abstract must be on a separate page. It should not exceed 200 words and should give the subjects and conclusions of the article and all results of general interest.

The rest of the manuscript should be arranged in the following order:

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Results and Discussion – should indicate the logic used for the interpretation of data without lengthy speculations. Authors submitting material on purely theoretical problems or on a new experimental technique might include it in this part.

Conclusions – short summary of the main achievement of the manuscripts.

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1. N. MANOLOV: Tribology. Nauka, Sofia, 1993.
2. K.-D. BOUZAKIS, N. MICHAILIDIS, S. GERARDIS, G. KATIRTZOGLU, E. LILI, M. PAPPA, M. BRIZUELA, A. GARCIA-LUIS, R. CREMER: Impact Resistance of Doped CrAIN PVD Coatings Correlated with Their Cutting Performance in Milling Aerospace Alloys. J Balk Tribol Assoc, **14** (3), 292 (2008).
3. A. A. CERIT, M. B. KARAMIS, F. NAIR: Review on Ballistic Tribology. J Balk Tribol Assoc, **12** (4), 383 (2006).
4. D. PETRESCU, N. N. ANTONESCU, M. NEASCU: The Modulation of the Dynamic Processes at the Thermal Spraying with High-speed Flame. Bulletin of Petroleum–Gas University of Ploiesti, **LVIII** (3), Technical Series, 49 (2006).
5. F. ZIVIC, M. BABIC, N. GRUJOVIC, S. MITROVIC, D. ADAMOVIC, G. FAVARO: A Comparison of Reciprocating Sliding at Low Loads and Scratch Testing for Evaluation of TiN (PVD) Coating. J Balk Tribol Assoc, **18** (1), 80 (2012).

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There are following limits for the respective papers (including text, all illustrative materials and references): short communication – 2–4 pp (up to 12 420 characters with spaces), full text article – 10 pp (up to 31 060 characters with spaces) and reviews – 16 pp (up to 49 696 characters with spaces).

The Editorial Board will strictly follow the contribution length in view of the over-accumulation of scientific papers and the restricted volume of each book. Contributions within the stated lengths will be published free of page charges. In case of exceeding length of the contributions are introduced page charges (up to 100 Euro).

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Manuscripts should be sent to the following address:

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All manuscripts are subject to critical review and the names of referees will not be given to authors of papers they have refereed. The manuscript sent back to the author for revision should be returned within 2 months in duplicate. Otherwise it will be considered withdrawn. Revised manuscripts are generally sent back to original referees for comments, unless (in case of minor revisions) the editors accept them without seeking further opinions. The authors receive PDF file of the paper.

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TRIBOLOGICAL OPTIMISATION OF RECIPROCATING MACHINES ACCORDING TO IMPROVING PERFORMANCE

S. MILOJEVIC*, R. PESIC, D. TARANOVIC

*Faculty of Engineering, University of Kragujevac, 6 Sestre Janjic Street,
34 000 Kragujevac, Republic of Serbia
E-mail: tiv@kg.ac.rs*

ABSTRACT

Lowering fuel consumption and exhaust emissions continue to be prime targets in the development of technology applied for motor vehicles and their equipment. Into the focus of attention are the reduction of the vehicle weight as well as, in the field of internal combustion engine technology, more efficient combustion system and accessory components.

As a complex system, the internal combustion engine accounts for a major part of the vehicle mass. The key components, the cylinder head and the cylinder block, for heavy loaded diesel engines, are today almost exclusively produced from aluminum. Also, by application of the aluminum pistons, it reduces engines weight and inertial forces, as well as the engine vibrations. According to the latter, the use of lightweight materials for construction of engine accessories as it is small air reciprocating compressor for braking system of trucks and buses, give contributions to the reduction of equipped vehicle mass.

The advantage of aluminum with regard to the specific weight is notable, but exist the problem because it has considerable disadvantages in terms of the thermal expansion coefficient. The greater thermal expansion would cause unacceptable deformation during reciprocating machine operations. With additional coating on the cylinder liner surfaces it overcomes poor aluminum strain properties. By application of piston with tribological inserts towards lowering friction resulting in lower mechanical losses and higher performance. The authors hope to obtain more measurement data on the test bench for small air reciprocating compressors in the Engine Laboratory at the Faculty of Engineering, University of Kragujevac.

Keywords: reciprocating aluminum machines, coating, lowering friction.

* For correspondence.

