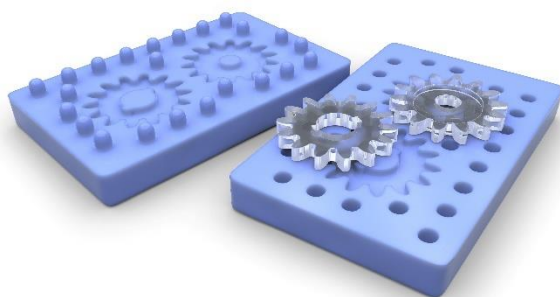


SLOVENIAN SOCIETY FOR TRIBOLOGY

5th International Conference on
POLYMER TRIBOLOGY

PolyTrib
2024



FINAL PROGRAMME

3rd – 4th October 2024

Grand Hotel Portorož, Portorož, Slovenia



*Tribology
and interface
nanotechnology*



LULEÅ
UNIVERSITY
OF TECHNOLOGY

DAY 1, 3rd October 2024

08:00–08:50 REGISTRATION

08:50–09:00 OPENING

SESSION 1

Chair: Nazanin Emami

09:00–09:40 Invited talk: S. Peeters, T. Reichenbach, G. Moras, M. Moseler, Fraunhofer Institute for Mechanics of Materials IWM & University of Freiburg, Freiburg, Germany

Friction and wear mechanisms of PTFE by atomistic simulations: transfer film formation and the synergy between PTFE and PEEK

09:40–10:00 C. Koplín, B. Schlüter, R. Jaeger, Fraunhofer Institute for Mechanics of Materials IWM, Freiburg, Germany

The effect of interaction energies on friction and wear of lubricated polymers

10:00–10:20 E. Schwartz, B. Jofore, SABIC Specialties Plasticslaan, Bergen op Zoom, The Netherlands

Lubricated alloys without PTFE for wear and friction applications

10:20–10:40 Y. Sawae, T. Morita, Q. Chen, H. Shinmori, Kyushu University, Japan

Contaminant emission from PPS-filled PTFE sliding in high purity hydrogen

10:40–11:00 COFFEE & POSTER SESSION



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DAY 1, 3rd October 2024

SESSION 2

Chair: Sujeet Kumar Sinha

- 11:00–11:20 **G. Theiler, N. Cano Murillo, H. Hashimoto, A. Aoyagi, E. Dobbelaar, Federal Institute for Materials Research and Testing (BAM), Berlin, Germany**
On the way to sustainable and hydrogen compatible sealing materials
- 11:20–11:40 **T. Horiuchi, Y. Sakai, S. Sato, A. Aoyagi, NOK corporation, Fujisawa, Japan**
In situ observation of grease lubricating film on rubber material for sealing by micro-infrared spectroscopy
- 11:40–12:00 **P. Beau, L. A. Frentrup, R. Weberskirch, G. Patzer, Beau Engineering Services, Cremlingen, Germany**
Biobased oligomeric and polymeric thickener systems for lubricating grease-potential applications based on tribotesting data
- 12:00–12:20 **H. Saito, Y. Kobayashi, Y. Sawae, Hitachi, Ltd., Research and development Group, Japan**
Effect of the copper filler micro-structure on the wear of PTFE Composites

12:20–13:40 LUNCH & POSTER SESSION



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DAY 1, 3rd October 2024

SESSION 3

Chair: Yoshinori Sawae

- 13:40–14:20 **Invited talk: K. K. Yap, M. A. Masen, Imperial College, London, UK**
In-situ tribometry for assessing ultralow polymer wear
- 14:20–14:40 **H. Shinmori, H. Hashimoto, K. Ishii, T. Morita, A. Aoyagi, S. Honda, Y. Sawae, Kyushu University, Fukuoka, Japan**
Friction and wear of PTFE and PEEK composites in high-pressure hydrogen gas
- 14:40–15:00 **H. Tanaka, H. Hashimoto, A. Aoyagi, J. Sugimura, Y. Sawae, Kyushu University, Fukuoka, Japan**
Friction and wear of several elastomers in hydrogen
- 15:00–15:20 **M. Kröll, I. Delic, M. Herr, G. Theiler, D. Spaltmann, Federal Institute for Materials Research and Testing (BAM), Berlin, Germany**
Harmonised tribological testing of polymers in hydrogen
- 15:20–15:40 **H. Hashimoto, S. Norikyo, A. Aoyagi, H. Tanaka, T. Morita, Y. Sawae, J. Sugimura, NOK corporation, Fujisawa, Japan**
Analysis of worn rubber surface after sliding test in hydrogen

15:40–16:00 COFFEE & POSTER SESSION



DAY 1, 3rd October 2024**SESSION 4****Chair: Helena Ronkainen**

- 16:00–16:40 **Invited talk: S. Kumar Sinha, Indian Institute of Technology Delhi, New Delhi, India**
High-performance polymer composites for tribology
- 16:40–17:00 **N. Emami, J. Somberg, V. F. Naeini, Luleå University of Technology, Luleå, Sweden**
Investigating the influence of water lubrication on the friction and wear behavior of UHMWPE–stainless steel systems: An experimental and molecular dynamics approach
- 17:00–17:20 **B. Jakab, A. M. Puhwein, AC2T research GmbH, Wiener Neustadt, Austria**
Correlation between wear and excitation frequencies of composite materials in rolling contact using a 3D vibrometer
- 17:20–17:40 **X. Wang, Y. Guo, T. Wu, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou, China**
VAT photopolymerization 3D printing of self-lubrication polymer composites
- 17:40–18:00 **Ú. Arinbjarnar, I. Sivebæk, Technical University of Denmark & LEGO Group, Denmark**
Using acoustic emissions to evaluate friction in polymer contacts

20:00–22:00 GALA DINNER

DAY 2, 4th October 2024**SESSION 5****Chair: Marc Masen**

- 08:30–09:10 **Invited talk: K. Mao, University of Warwick, Coventry, UK**
The performance enhancement of polymer composite gears
- 09:10–09:30 **H. Ronkainen, J. Pelto, E. Huttunen-Saarivirta, VTT Technical Research Centre of Finland, Espoo, Finland**
Development of abrasive wear resistance of polymers and scratch resistance of elastomers
- 09:30–09:50 **N. Osolnik, M. Kalin, University of Ljubljana, Slovenia**
In-situ optical measurement of wear in polymer gears: A novel approach
- 09:50–10:10 **T. Kunishima, V. Fridrici, P. Kapsa, JTEKT Corporation, Kashiwara, Japan**
Long life durability and tribology of polymer worm reducer for electric power steering
- 10:10–10:30 **D. Drees, L. Lopes, P. Baião, E. Schwartz, B. Jofore, Falex Tribology NV, Rotselaar, Belgium**
An efficient testing strategy for polymer materials, accelerating data production towards AI?

10:30–10:50 COFFEE & POSTER SESSION

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Photo: portoroz.si

DAY 2, 4th October 2024

SESSION 6

Chair: Ken Mao

- 10:50–11:30 **Invited talk: R. Gnanamoorthy, S. P. Dewri, Inidan Institute of Technology Madras, Chennai, India**
Tribo behaviour of natural fibres for sustainable technical textile applications
- 11:30–11:50 **P. Staudinger, R. Zhang, J. Heinrich, K. Pondicherry, Anton Paar GmbH, Graz, Austria**
Asphalt tribology – influence of polymers on bitumen performance
- 11:50–12:10 **R. Jackowiak, T. Bernard, P. Liekens, DuPont Specialty Products Operations Sàrl, Switzerland**
The influence of metallic alloys on polymeric tribological properties
- 12:10–12:30 **P. Gangwani, N. Emami, M. Kalin, University of Ljubljana, Slovenia**
Investigating the role of a hard nano-filler on the tribological performance of multi-scale UHMWPE composites under water-lubricated condition
- 12:30–12:50 **M. Tockner, P. Staudinger, M. Fasching, K. Pondicherry, T. Schwarz, R. C. Kerschbaumer, F. Grün, Polymer Competence Center Leoben GmbH, Leoben, Austria**
The influence of temperature on fretting wear of elastomers

12:50–14:10 LUNCH & POSTER SESSION



DAY 2, 4th October 2024**SESSION 7****Chair: Geraldine Theiler**

- 14:10–14:30 **B. Jakab, E. Vakalopoulou, P. Hahnekamp, N. Gamsjäger, M. Ruthner, AC2T research GmbH, Wiener Neustadt, Austria**
Tribological properties of high-performance polymer thin coatings for cleaning-intensive surfaces
- 14:30–14:50 **M. Unterreiter, M. Tockner, T. Gehling, R.C. Kerschbaumer, M. Fasching, T. Schwarz, G. Pinter, Polymer Competence Center Leoben GmbH, Leoben, Austria**
A study of manufacturing settings: impact on the mechanical and tribological properties of filled nitrile butadiene rubber
- 14:50–15:10 **K. Ormanbekov, A. Zhassulan, B. K. Rakhadilov, Z. A. Satbayeva, A. B. Shynarbek, Shakarim University, Semey, Kazakhstan**
Influence of electron beam irradiation on tribological and mechanical properties of polytetrafluoroethylene
- 15:10–15:30 **A. Krishnan, M. Kamaraj, P. K. Nayak, S. Ramaprabhu, Inidan Institute of Technology Madras, Chennai, India**
Enhanced friction reduction using 2D MoO₃-hBN heterostructures as lubricant additives in PAO oil

15:30–15:40 CONFERENCE CLOSURE

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POSTERS

- I. **A. Ignatijev, M. Borovinšek, S. Glodež, University of Maribor, Slovenia**
Computational modeling of dry sliding wear in polymer gears
- II. **A. Namwoonde, G. Theiler, O. Johnson, T. Böllinghaus, Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany**
Polymer composites under reciprocating sliding condition in hydrogen
- III. **G. Theiler, N. Cano Murillo, H. Hashimoto, A. Aoyagi, E. Dobbelaar, Federal Institute for Materials Research and Testing (BAM), Berlin, Germany**
Effect of temperature on the friction behaviour of rubber materials in hydrogen
- IV. **T. Kunishima, V. Fridrici, P. Kapsa, JTEKT CORPORATION, Kashiwara, Japan**
Wear mechanism of glass fiber-reinforced PA66 in contact with steel under grease lubrication and carboxylate addition effect to grease
- V. **J. Melichar, A. Foitlová, M. Mészáros, SVÚM a.s., Polymers and Fluoroplastics Technology Department, Čelákovice, Czech Republic**
Influence of degradation of PTFE-PEEK polymer blend on tribological properties



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