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KOSHI ADACHI

Position	Professor
Affiliation	Laboratory of Tribology and Nanointerface Engineering
	Department of Mechanical Systems Engineering
	Faculty of Engineering
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Date of birth	August 12, 1964

EDUCATION

Ph. D. in Mechanical Engineering, 1998
Department of Mechanical Engineering, Tohoku University, Japan

M. S. in Mechanical Engineering, 1990
Department of Mechanical Engineering, Tohoku University, Japan

B. S. in Mechanical Engineering, 1988
Department of Mechanical Engineering, Tohoku University, Japan

EMPLOYMENT

Professor: Faculty of Engineering, Tohoku University, Japan.
April, 2011-Present

Associate Professor: Faculty of Engineering, Tohoku University, Japan.
November, 2001-March, 2011

Assistant Professor: Faculty of Engineering, Tohoku University, Japan.
September, 2000-November, 2001

Research Associate: Faculty of Engineering, Tohoku University, Japan.
April, 1990-September 2000

MEMBERSHIP

Japan Society of Mechanical Engineers (JSME)

Japanese Society of Tribologists (JAST)

Society of Tribologists and Lubrication Engineering, USA (STLE)

Japanese Society for Precision Engineering (JSPE)

SHORT BIOGRAPHY

Koshi Adachi graduated in Mechanical Engineering from Tohoku University in 1988 and obtained his Ph. D for research in Tribology from Tohoku University, Japan in 1998.
He started to work as a research associate in 1990, and he is currently full professor at the Faculty of Engineering, Tohoku University. He is the head of "Laboratory of Tribology and Nanointerface Engineering" and director of "Center for Tribologically-based Machine Design", in Division of Mechanical Engineering, Tohoku University.

His research interests span a wide range of tribology, including fundamental and application of tribology, with a particular interest in friction and wear mechanisms of advanced materials, technology for super-low friction such as surface texturing and new coatings, science and technology for running-in control and functional interface (nanointerface) formed during friction automatically, environmentally-friendly mechanical systems with water and gas lubrication, friction drive with ultrasonic and surface acoustic wave for precise positioning systems and control of tribo-chemical reaction. He is currently challenging to establish new concept named as "Tribologically-based Machine Design" and "Science of running-in"..

He has published more than 100 peer-reviewed papers, 14 book/handbook chapters and 26 invited review papers, and he holds 8 patents related to tribological technology. He was given about 40 and 120 invited/keynote/plenary talks at international and domestic conferences, respectively. He has been also active as a member of Editorial boards of 6 international journals such as International Journal of WEAR, Lubrication Science and so on.

Recent Major National Projects

(a) Research leader

1. Strategic Basic Research Programs CREST, Phase Interface Science for Highly Efficient Energy Utilization (2013-2018)
   Sponsor: Japan Society for the Promotion of Science (JSPS)
   Project name: Creation of Nanointerface Controlled by Tribochemical Reaction for Mechanical Systems with Super-low Friction
2. Funding Program for Next Generation World-Leading Researchers (NEXT Program) (2010-2013)
   Sponsor: Cabinet Office, Japan Society for the Promotion of Science (JSPS)
   Project name: Optimization Technology of Nanoscopic Interface for Low Friction Systems and Tribologically-based Machine Design"

(b) Shared researcher

1. Cross-ministerial Strategic Innovation Promotion Program (SIP) (2014-2019)
   Sponsor: Cabinet Office, Government of Japan
   Project name: Research and Development on Effective Use of Exhaust Energy and Reduction of Mechanical Friction Loss
2. Tohoku Innovative Materials Technology Initiatives for Reconstruction (2012-2017)

Sponsor: Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan. Reconstruction Agency

Project name: Ultra-Low Friction Technology Area

3. Green Innovation Creation Project "Green Network of Excellence (GRENE) (2011-2015)

Sponsor: Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan

Project name: Green Tribology Innovation Network

4. Low-carbon research network Japan (2010-2014)

Sponsor: Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan

Project name: Creation for Fusion Research of Nano-interface Devices, Tohoku University

RESEARCH ACTIVITIES

AWARDS

1. Outstanding Young Lecturer Award in the Japan Society for Precision Engineering, Japanese Society for Precision Engineering, 1996.
2. Outstanding Young Researcher Prize, Aoba Foundation, 1996.
3. Outstanding Young Researcher Award in the Japanese Society of Tribologists, Japanese Society of Tribologist, 1998.
4. Best Paper Award, Japan Society of Mechanical Engineers, 1999.
5. Best Presentation Award, Japanese Society for Precision Engineering, 1999.
6. 2nd World Tribology Congress Best Poster Award, The Austrian Tribology Society and The International Tribology Council, 2001.
7. Technology Award, Tohoku Branch of Japan Society of Mechanical Engineers, 2003
8. Best Paper Award, Japanese Society of Tribologists, 2003.
9. JSPE Takagi Award, The Japan Society for Precision Engineering, 2003
10. Best Presentation Award, Japanese Society for Tribologists, 2004.
11. Research Incentive Award, TOKIN Science and Technology Promotion Foundation, 2005
12. 15th International Conference on Wear of Materials Best Poster Award, Elsevier, Committee of 15th International Conference on Wear of Materials, 2007.
13. The Peter Blau Best Poster Award (Winner),17th International Conference on Wear of Materials, Conference Chair of 17th International Conference on Wear of Materials, 2009.
14. The Peter Blau Best Poster Award (Honourable mention), 17th International Conference on Wear of Materials, Conference Chair of 17th International Conference on Wear of Materials, 2009.
15. 5th Special Award of MONODZUKURI Liaison Awards, Nikkan Kogyo Shinbun, Ltd., 2010
16. Best Paper Award, Japanese Society of Tribologists, 2014.
17. Eiji Mutoh Valuable Publishing Award, Japan Society for Design Engineering, 2015
18. The Peter Blau Best Poster Award (Honourable mention), Bruker and Steering Committee of 21st International Conference on Wear of Materials, 2017.

PATENTS

1. Evaluation method of rubbing cloth, Japanese Patent No. 3636601, 14 January, 2005.
2. Ultrasonic motor and guide apparatus having the same as driving source of movable body, USA Patent No. 6897598, 24 May, 2005.
3. Guide device using an ultrasonic motor as a driving source of a movable body, Japanese Patent No. 3827554, 14 July, 2006.
4. Guide device using an ultrasonic motor as a driving source of a movable body, Japanese Patent No. 4127633, 23 May, 2008.
5. Guide device using an ultrasonic motor as a driving source of a movable body, Japanese Patent No. 4462696, 26 February, 2010.
6. Tribological system, Japanese Patent No. 4535534, 25 June, 2010.
7. Slide device, mechanical seal, rotary device, pump and auxiliary artificial heart system, U. S. Patent No. 8,568,288, November 21, 2013.
8. Friction method, manufacturing method of frictional structure, frictional structure and device, Japanese Patent No. 6095090, 24 February, 2017.

PUBLICATIONS

Books & Handbooks

1. Metal Handbook (Revised 6th Edition), Edited by Japan Institute of Metals and Materials, Maruzen Publishing Co., Ltd., (2000) 378-385, 397-400.
   Chapter 5 Dynamic property 5.6 tribology,
   Chapter 6 Dynamic property 6.1.6 Wear testing method
   Koji Kato, Koshi Adachi
2. MODERN TRIBOLOGY HANDBOOK, Volume One, Principles of Tribology, Edited by Bharat Bhushan, CRC Press, (2000) 273-300, 771-785.
   Chapter 7: Wear Mechanisms
   Chapter 21: Metals and Ceramics
   Koji Kato, Koshi Adachi
3. Tribology of Ceramics, Japanese Society of Tribologists, Yokendo Ltd., Publishers, (2003) 82-94.
   I Fundamentals, Chapter 2 Tribological properties of Ceramics, 2.3 Potential of Ceramics as Tribological materials
   Koshi Adachi, Koji Kato
4. Mechanical Engineering Handbook, Design β4, Machine Element and Tribology, Edited by the Japan Society of Mechanical Engineers, (2005) β 4-47.
   Chapter 3 Shaft and Bearing Element, 3.2.7.b Rubber Bearings, Ceramic Bearings
   Koshi Adachi, Koji Kato
5. Superlubricity, Edited by A. Erdemir and J.-M. Martin, Elsevier, (2007) 341-364.
   Chapter 20: Superlubricity of CNx-coatings in Nitrogen Gas Atmosphere
   Koji Kato and Koshi Adachi
6. Tribology of Diamond-Like Carbon Films: Fundamentals and Applications, Edited by Christophe Donnet and Ali Erdemir, Springer, (2007) 339-361.
   Chapter 13: Tribology of Carbon Nitride Coatings
   K. Adachi and K. Kato

7. Fundamentals and applications of MEMS/NEMS, Technosystem Co. Ltd., (2008) 577-584.
   Chapter 4 MEMS/NEMS Fundamental technology for Application, Section 9 Tribology
   Koshi Adachi
8. Practical: Precision positioning technology dictionary, Industrial Technology Service Center, (2008) 108-117.
   Chapter 2 Phenomena and factors controlling core performance, Section 5 Interface properties and tribology
9. Strength Design Handbook for Failure Prevention of Products, NTS Inc., (2012) 96-99.
   Chapter 5 Surface Damage, Section 2 Tribology: Brittle Fracture Type Wear of Ceramics in Friction Drive System for Precise Positioning Stage,
   Koshi Adachi
10. A 1st Course in Tribology, Authored by Shinya Sasaki, Masayuki Shima, Syoji Noguchi, Tomoko Hirayama, Tatsuhiro Jibiki, Koshi Adachi and Koji Miyake, Kodansha Ltd., (2013) 105-125.
    Chapter 7 Wear
    Koshi Adachi
11. Measurement and Instrumentation, Bilingual edition, Authored by Wei Gao, Yuki Shimizu, Kazuhiro Hane, Hitoshi Soyama and Koshi Adachi, Asakura Publishing Co. Ltd., (2017) 102-114.
    Chapter 9 Measurement of Mechanical Properties of Materials
    Koshi Adachi

Peer-Reviewed Articles

1. The wear mechanism of silicon nitride in rolling-sliding contact
   Wear, 151 (1991), 291-300.
   Koshi Adachi, Kazuo Hokkirigawa, Koji Kato
2. Transmission Systems of Motion and Force -Friction Drive / Traction Drive-
   Journal of Advanced Automation Technology, 7 (1995), 190-196.
   Koshi Adachi and Koji Kato
3. Wear Mechanisms and Wear Map of Aumina Sliding against Bearing Steel
   Transactions of the Japan Society of Mechanical Engineers, C, 61 (1995), 1605-1612.
   N. Chen, K. Adachi, K. Kato
4. The Effect of Temperature on Tribological Properties of Alumina Ceramics in Unlubricated Sliding Contact (Relationship between Wear properties and Tribo-Film Formation)
   Transactions of the Japan Society of Mechanical Engineers, C, 61 (1995), 2553-2558.
   K. Adachi, K. Kato, E. Inoue, S. Kagimoto
5. TRANSITION MECHANISMS OF WEAR MODES IN SLIDING OF CERAMICS
   Proceedings of the International Tribology Conference, Yokohama 1995, 1 (1996), 409-414.
   Ning CHEN, Koshi ADACHI and Koji KATO
6. MECHANISM OF SMOOTH TRIBO-FILM FORMATION OF CERAMICS IN SLIDING CONTACT
   Proceedings of the International Tribology Conference, Yokohama 1995, 1 (1996), 415-420.

Koshi ADACHI, Koji KATO, Eiji INOUE and Ryuichi TAKIZAWA

7. Smoothing effect of the third body compaction on alumina surface in sliding contact
   Proceedings of the 22nd Leeds-Lyon Symposium on Tribology, The Third Body Concept / D. Dowson et al. (Editors), 1996 Elsevier Science B. V., Tribology Series, 31 (1996), 585-596.
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8. Wear Mechanisms of Alumina Ceramics in Unlubricated Rolling-Sliding Contact (Effect of Tribo-Film on Wear Process)
   Transactions of the Japan Society of Mechanical Engineers, C, 62 (1996), 1047-1053.
   K. Adachi, K. Kato
9. Basic Study of Lubrication by Tribo-Coating for Space Machines
   Transactions of the Japan Society of Mechanical Engineers, C, 62 (1996), 3237-3243.
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10. The micro-mechanism of friction drive with ultrasonic wave
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11. Wear map of ceramics
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12. Wear Map of Ceramics (1st Report, Classification of Wear Mode – Mild Wear / Severe Wear)
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13. Wear Map of Ceramics (2nd Report, Construction of Mild-Severe Wear Mode Map)
    Transactions of the Japan Society of Mechanical Engineers, C, 63 (1997), 2448-2455.
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14. Mechanism of Uneven Brightness due to Rubbing in Liquid Crystal Display
    Journal of the Japan Society for precision Engineering, 66 (2000), 1548-1551.
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15. The Effect of Frictional Energy on Uneven Display of Brightness in Liquid Crystal Display
    Journal of the Japan Society for precision Engineering, 66 (2000), 1875-1878.
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16. Formation of smooth wear surfaces on alumina ceramics by embedding and tribo-sintering of fine wear particles
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    Koshi Adachi, Koji Kato
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    PROCEEDINGS OF THE TWENTY-SECOND INTERNATIONAL SYMPOSIUM ON SPACE
    TECHNOLOGY AND SCIENCE, 1 (2000), 593-598.
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18. Self-Lubrication by Formation of Graphite Films in the Sliding of Silicon Nitride against Cast Iron
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    Tribology Letters, 11 (2001), 23-28.
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21. The effect of laser texturing of SiC surface on the critical load for the transition of water lubrication mode from hydrodynamic to mixed
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    Xiaolei Wang, Koji Kato, Koshi Adachi, Kohji Aizawa
22. Friction and wear of self-mated SiC and Si_3N_4 sliding in water
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23. WEAR PROPERTIES OF ALUMINA TIP OF ULTRASONIC MOTOR IN DRIVING OF ALUMINA SLIDER
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    Koshi ADACHI, Yusaku ISHIMINE and Koji KATO
24. THE EFFECT OF SURFACE TEXTURE ON SEIZURE BETWEEN SiC CYLINDERS SLIDING IN WATER
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25. FRICTION PROPERTIES OF SELF-MATED Si_3N_4 AND SiC CERAMICS IN WATER AND IN AIR AFTER RUNNING-IN IN WATER
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26. THE EFFECT OF FRICTIONAL ENERGY IN RUBBING PROCESS ON UNEVEN DISPLAY OF BRIGHTNESS IN LIQUID CRYSTAL DISPLAY
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27. The comparisons of sliding speed and normal load effect on friction coefficients of self-mated Si_3N_4 and SiC under water lubrication
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Koji Kato, Koshi Adachi

30. The Lubrication Effect of Micro-Pits on Parallel Sliding Faces of SiC in Water
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XIAOLEI WANG, KOJI KATO and KOSHI ADACHI

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Journal of the Japan Society for precision Engineering,, 69 (2003), 591-596.
Koshi Adachi, Koji Kato, Yosuke Koizuka

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Lizhi Su, Junguo Xu, Masayuki Kurita, Koji Kato and Koshi Adachi

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Koji Kato, Noritsugu Umehara, Koshi Adachi

36. Wear-mode mapping for the micro-scale abrasion test
Wear, 255 (2003), 23-29.
K. Adachi, I. M. Hutchings

37. Effect of interlayer thickness of ion-plated Pb-coating on its life (SUS440C substrates)
Tribology Letters, 15 (2003), 319-325.
B. Subramonian, K. Kato, Koshi Adachi and K. S. Ramakrishnan

38. Tribologically-based Design of Precise Positioning Stage
Tribological Research and Design for Engineering Systems / D. Dowson et al. (Editors), 2003 Elsevier Science B. V., Tribology Series, 41 (2003), 461-468.
K. Adachi, T. Yamaguchi, Y. Ishimine and K. Kato

39. The critical condition for the transition from HL to ML in water-lubricated SiC
Tribology Letters, 16 (2004), 253-258.
Xiaolei Wang, Koji Kato, and Koshi Adachi

40. Wear mode control of drive tip of ultrasonic motor for precision positioning
Wear, 256 (2004), 145-152.
T. Yamaguchi, K. Adachi, Y. Ishimine, K. Kato

41. The effect of graded interface thickness on the life of Pb coating ion plated on SUS 17-4PH steel substrate
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B. Subramonian, K. Kato, Koshi Adachi, K. S. Ramakrishnan

42. THE EFFECT OF CONTACT MORPHOLOGY ON INITIATION AND PROPAGATION OF MICRO-SLIP AT CONTACT INTERFACE

Proceedings of 2004 ASME/STLE International Joint Tribology Conference, (2004), TRK-4 TOC, 1-6.

Koshi Adachi, Koji Kato, Jun Liu, Hiroshi Kawamura

43. Friction Control of Active-Head Slider During Flying Height Adjustment

Journal of Tribology, Transactions of the ASME, 127 (2005), 871-877.

Lizhi Su, Junguo Xu, Masayuki Kurita, Koji Kato, Koshi Adachi, Yoshihiko Miyake

44. Friction and wear properties of CNx / SiC in water lubrication

Tribology Letters, 18 (2005), 153-163.

F. Zhou, K. Kato and K. Adachi

45. Sensitivity of wear rates in the micro-scale abrasion test to test conditions and material hardness

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K. Adachi, I. M. Hutchings

46. Effect of a-CN_x Coating on Tribological Properties of SiC Ceramic in Water

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Fei Zhou, Koji Kato, Koshi Adachi

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Fei Zhou, Koshi Adachi, Koji Kato

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Lizhi Su, Masayuki Kurita, Junguo Xu, Koji Kato, Koshi Adachi, Yoshihiko Miyake

53. Experimental evaluation of friction and wear properties of solid lubricant coatings on SUS440C steel in liquid nitrogen

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B. Subramonian, K. Kato, K. Adachi and B. Basu

54. Effect of surface texture on water lubrication properties of advanced ceramics
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Koshi Adachi, Katsunori Otsuka, Xiaolei Wang, Koji Kato

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M. A. Masen, M. B. de Rooij, D. J. Schipper, K. Adachi, K. Kato

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18. Future Prospects of Tribologists – Mission of Tribologists –
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International Conferences

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International Workshop on Making, Shaping and Damage Mechanism in Ceramics, Bangalore, India, December, 1998.
2. Mirror Wear Surface of Alumina Formed by Wear Particles in Unlubricated Sliding at High Temperature **(Keynote)**
International Symposium on Genesis and Role of Transfer layer / Mechanically Mixed Layer in Wear of Materials, Hyderabad, India, December, 1998.

3. Friction Control by Tribo-coating for Space Machines
   International Workshop on Space Tribology in 21st Century, Sendai, Japan, April, 2000.
4. Wear Mode Mapping
   Special Seminar at Research Center in Surface Engineering, University of Hull, Hull, UK, September, 2002.
5. Tribologically-based Machine Design
   Micromechanics Seminar at Engineering Design Centre, Cambridge, UK, December, 2002.
6. Tribo-coating for Space Mechanisms
   International Symposium on Space Tribology, Daegu, Korea, August, 2003.
7. Tribological Approach for Durability and Reliability of Ultrasonic Motor **(Keynote)**
   The 18th International Congress on Acoustics, Kyoto, Japan, April, 2004.
8. Fundamentals of Water Lubrication
   International Tribology Conference Kobe 2005, Kobe, Japan, May, 2005.
9. Evaluation and Control of Alignment of Liquid Crystal Molecules in Rubbing Process
   Special lecture in Industrial Technology Research Institute, Taiwan, December, 2005.
10. New Lubrication of Ceramic Tribo-element
    11th International Ceramics Congress & 4th Forum on New Materials, Sicily, Italy, June, 2006.
11. Wear in Micro/Nano Scale (Keynote Speech)
    2nd Vienna International Conference Micro- and Nano-Technology, Vienna, Austria, March, 2007.
12. Tribology for Space Applications: In-situ and On-demand Lubrication System **(Keynote)**
    16th International Conference on Wear of Materials, Montreal, Canada, April, 2007.
13. Tribologically-based Design for Nano/Micro Technology
    The Fourth Lyon-Tohoku Engineering and Science Forum, Sendai, Japan, December, 2007.
14. The Effect of Nitrogen Gas on Reducing Friction of CNx-Coatings
    7th Int. Symp. on Advanced Fluid Information & 4th Int. Symp. on Transdisciplinary Fluid Integration, Sendai, Japan, December, 2007.
15. Tribology for Space Applications: In-situ and on-demand tribo-coatings **(Keynote)**
    IISc Centenary - International Conference on Advances in Mechanical Engineering, Bangalore, India, July, 2008.
16. Control of Running-in for Reducing Friction of CNx-coatings under Nitrogen Gas
    5th International Conference on Flow Dynamics, Sendai, Japan, November, December, 2008.
17. Advanced Lubrication of Ceramic Tribo-elements
    International Conference on Frontier of Energy Flow Dynamics in Atomistic and Electronics Scales, Sendai, Japan, February, 2009.
18. Super-low Friction of Carbon-based Coatings in Nitrogen Gas
    International Conference on Metallurgical Coatings and Thin Films 2009, San Diego, USA, April, 2009.
19. Running-in for Reducing Friction of CNx-coatings in Nitrogen Gas

World Tribology Congress 2009, Kyoto, Japan, September, 2009.

20. Running-in Control by Surface Texturing for Super-low Friction of Ceramics in Water
International Workshop on Surface Texturing 2010, Beijing, China, September, 2010.
21. Super-low Friction of CNx-coatings in Inert Gas
Multiscale Materials Modeling 2010, Freiburg, Germany, October, 2010.
22. Tribologically-Based Design of Precise Positioning Stage Driven by Friction Drive Actuator: Ultrasonic Motor and Surface Acoustic Wave Motor
6th China International Symposium on Tribology, Chinese Tribology Institute, Lanzhou, China, August, 2011.
23. Tribologically-Based Design of Surface Texturing-Surface Texturing for Control of Nanointerface Giving High Tribological Performance-
International Tribology Conference Hiroshima 2011, Japanese Society of Tribologists, Hiroshima, October 30- November 3, 2011.
24. Super-Low Friction of Carbon-Based Coatings
Third Advanced Forum on Tribology 2012, Nagoya, Japanese Society of Tribologists, Nagoya, April 15-17, 2012.
25. Creation of Nanointerface for Super-low Friction **(Plenary talk)**
8th International Conference on Industrial Tribology, Pune, India, December 9, 2012.
26. Generating Mechanism of Low-frequency Stick-slip Motion and Creep Groan Map
Third International Forum on the Fundamentals of Sliding Friction and Vibration, Seoul, Korea, May 7, 2013.
27. Formation of Nanointerface for Super-low Friction by Surface Texturing
The 12th International Symposium on High Performance of Tribosystem, Daegu, Korea, September 29, 2013.
28. Creation of nanointerface for super-low friction system with carbon-based coatings
GRENE & TIMT Joint International Symposium on Tribology, Sendai, October 7, 2013.
29. Creation of Nanointerfaces for Super-Low Friction
Gordon Research Conference on Tribology, Bentley University, Waltham, MA, July 22, 2014.
30. Running-in Control for Super-Low Friction of Carbon Nitride Coatings
Czech-Japan Tribology Workshop, Mikulov, Czech Republic, November 2014.
31. Tribological Properties of MoS_2-containing Hydrogenated DLC Coatings
2015 HYDROGENIUS & I²CNER Tribology Symposium, Fukuoka, Japan, February 4, 2015.
32. Creation of Nanointerface for Super-Low Friction
State Key Laboratory of Tribology, Tsinghua University, July 3, 2015
32. Running-in Control for Creation of Nanointerface for Super-low Friction
XIN Workshop on Superlubricity: Fundamental and Applications, Beijing, China, 18-20 October 2015
34. Creation of Nano-Interface for Super-Low Friction - Active Control of Running-in - **(Key note)**
6th Vienna International Conference, Nano-Technology- Focus: Tribological Aspects Viennano '15, Wiener Neustadt, November 24, 2015.
35. Running-in: playing with friction history to promote super-low friction

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36. Creation of nanointerface for super-low friction of carbon-based coatings
    Japan-Korea Tribology Symposium 2016: Functional Coatings and Carbon-Related Materials, National Olympic Memorial Youth Center, Tokyo, May 23, 2016.
37. Running-in Control for Creation of Nanointerface for Super-low Friction
    4th International Tribology Symposium of IFToMM (ITS-IFToMM 2017), 1st K-Tribology International Symposium (K-TIS 2017), Jeju, Korea, March 21, 2017.
38. Running-in Control for Creation of Nanointerface giving Super-low Friction
    The 6th European Conference on Tribology, ECOTRIB 2017, Ljubljana, Slovenia, June 8, 2017.
39. Continuous Formation of Nanointerface to Promote Super-low Friction of Carbon-based Coatings **(Keynote)**
    6th World Tribology Congress, Beijing, China, September 18, 2017.
40. Creation of Nanointerface for Super-Low Friction **(Plenary lecture)**
    14th International Conference on Flow Dynamics, Sendai, Japan, November 1, 2017.