



Peter J. Blau, Tribology Consultant

## Publications Listed by Subject Area

1. Automotive and Truck Brakes
2. Friction – Fundamentals, Modeling, and Application
3. Friction and Wear – Overviews, Handbooks, and Edited Works
4. Friction and Wear – Test Methods, Techniques, and Standards
5. Friction and Wear – Transitions including Running-in
6. Indentation Hardness and Scratch Testing
7. Lubricants
8. Machining, Surface Quality, and Friction Drilling
9. Meteoritics and Lunar Science
10. Materials Engineering – Non-tribology
11. Terminology and Definitions
12. Wear – Sliding and Abrasion of Specific Materials
13. Wear – Fretting and Repetitive Impact
14. Patents
15. Standards Participation and Coordination

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### 1. Automotive and Truck Brakes

- P. J. Blau, R. L. Martin, M. H. Weintraub, H. Jang, and W. Donlon (1996) "Frictional Behavior of Automotive Brake Materials Under Wet and Dry Conditions," ORNL Technical Report, ORNL/M-5824, 41 pp.
- P. J. Blau (2000) "Energy Efficiency in Heavy Vehicle Tires, Drivetrains, and Braking Systems – A Multi-year Program Plan," ORNL Technical Report, ORNL/TM-2000/177, 10 pp.
- P. J. Blau (2001) "Compositions, Functions, and Testing of Friction Brake Materials and Their Additives," Technical Report, ORNL/TM-2001/64, 29 pp. D. F. Wilson, E. A. Kenik, and P. J. Blau (2002) "Evaluation of Corrosion Failure in Tractor-Trailer Brake System," Technical Report, ORNL/TM-2002/161, 21 pp.
- P. J. Blau and J. C. McLaughlin (2003) "Effects of Water Films and Sliding Speed on the Frictional Behavior of Truck Disc Brake Materials," *Tribology International*, Vol. 36 (10), pp. 709-715.
- P. J. Blau and H. M. Meyer III (2003) "Characteristics of Wear Particles Produced during Friction Tests of Conventional and Non-Conventional Disc Brake Materials," *Wear*, Vol. 255, 1261-1269.
- P. J. Blau (2003) "Microstructure and Detachment Mechanism of Friction Layers on the Surface of Brake Shoes," *J. of Matls. Engr. and Performance*, Vol. 12(1), pp 56-60.
- P. J. Blau (2004) "Research on Non-Traditional Materials for Friction Surfaces in Heavy Vehicle Disc Brakes," Oak Technical Report, ORNL/TM-2004/265, 31 pp.
- P. J. Blau and B. C. Jolly (2005) "Wear of truck brake lining materials using three different test methods," *Wear*, Vol. 259, Part 1, pp. 1022-1030.
- P. J. Blau, B. C. Jolly, W. H. Peter, and C. A. Blue (2007) "Tribological Investigation of Titanium-Based Materials for Brakes," *Wear*, Vol. 263 (7-12), pp. 1202-1211.
- P. J. Blau, J. J. Truhan and E. A. Kenik (2007) "Effect of exposure to corrosive salts on the frictional behavior of gray cast iron and a titanium-based metal matrix composite," *Trib. Intern.*, Vol. 40, pp. 1335-43.
- K. Lee, P. Blau, and J. J. Truhan (2007) "Effects of Moisture Adsorption on Laboratory Wear Measurements of Brake Friction Materials," *Wear*, Vol. 262 (7-8), pp. 925-930.
- P. J. Blau (2007) "Prospects for Titanium-Based Materials as Truck Disc Brake Rotors," ORNL Tech Report, ORNL TM 2007/111, 27 pp.
- J. Qu, P. J. Blau, and B. C. Jolly (2009) "Oxygen-diffused titanium as a candidate brake rotor material," *Wear*, Vol. 267, Issues 5-8, pp. 818-822.

## 2. Friction – Fundamentals, Modeling, and Applications

- P. J. Blau (1982) "Test of a Rule of Mixtures for Dry Sliding Friction of 52100 Steel on an Al-Si-Cu Alloy," *Wear*, Vol. **81**, p. 187-192.
- P. J. Blau (1990) "Reducing Friction to Save Energy," *Oak Ridge National Laboratory Review*, No. 4, p. 10.
- P. J. Blau (1991) "Scale Effects in Steady-State Friction," *Tribology Trans.*, Vol. **34** (3), pp. 335-342.
- P. J. Blau (1992) "Scale Effects in Sliding Friction: An experimental study," in Fundamentals of Friction, ed. I. L. Singer and H. M. Pollock, Kluwer Acad. Pub., pp. 523-534.
- P. J. Blau (1992) "Appendix: Compilation of Friction Coefficients," in the ASM Metals Handbook, 10th Ed., Vol. **18**, Friction, Lubrication, and Wear Technology, ASM Materials Park, Materials Park, OH.
- P. J. Blau (1992) "Relating Laboratory Friction Coefficient Values to Practical Applications," in Proc. Ann. Auto. Tech. Dev. Contractors' Coord. Meeting 1991, S.A.E., Warrendale, PA, pp. 571-578.
- P. J. Blau (1992) "Friction microprobe investigation of particle layer effects on sliding friction," *Wear*, Vol. **162-164**, pp. 102-109.
- P. J. Blau (1993) "Friction Process Diagrams for Analyzing Interfacially-Complex Sliding Contacts," *Tribology Transactions*, Vol. **37** (4), pp. 751-756.
- P. J. Blau (1996) Friction Science and Technology, Marcel Dekker, New York, 426 pp.
- P. J. Blau (1998) "Four Great Challenges Confronting our Understanding and Modeling of Sliding Friction," in Tribology for Energy Conservation, ed. D. Dowson, Elsevier, UK, pp. 117-128.
- P. J. Blau (2008) Friction Science and Technology, 2<sup>nd</sup> ed., CRC/Taylor and Francis, Boca Raton, Florida, 420 pp.
- P. J. Blau (2001) "Significance and Use of the Friction Coefficient," *Tribology International* special issue on Friction Testing for Research and Applications, Vol. **34** (9), pp. 585-91.
- P. J. Blau (2001) "Friction mechanisms and modeling on the macroscale," in Fundamentals of Tribology and Bridging the Gap Between the Macro- and Micro/Nanoscales, ed. B. Bhushan, Kluwer Academic Publishers, Dordrecht, pp. 241-260.
- P. J. Blau (2001) "Experimental aspects of friction research on the macroscale," in Fundamentals of Tribology and Bridging the Gap Between the Macro- and Micro/Nanoscales, ed. B. Bhushan, Kluwer Academic Publishers, Dordrecht, pp. 261-278.
- P. J. Blau (2009) "Embedding Wear Models into Friction Models," *Tribology Letters*, Vol. 34 (1), pp 75-79.
- P. J. Blau (2012) "Friction," Chap. 5 in Handbook of Lubrication and Tribology, Vol. II, Theory and Design, 2<sup>nd</sup> ed., ed. R. W. Bruce, CRC/Taylor and Francis, Boca Raton, Florida, p. (5-1).
- P. J. Blau (2012) "Use of Textured Surfaces to Mitigate Sliding Friction and Wear of Lubricated and Non-Lubricated Contacts: An annotated review," Oak Ride National Lab. Tech. Report, ORNL/TM-2012/20, March 15, 2012, 19 pp.
- N. R. Davies and P. J. Blau (2013) "Comparison of Frictional Heating Models," ORNL/TM-2013/398, 14 pp.

## 3. Friction and Wear – Overviews, handbooks, and edited works

- P. J. Blau (1980) "The Role of Metallurgical Structure in Sliding Solid Contacts," ASME Appl. Mechanics Div., Pub. AMD-39, pp. 185-191.
- P. J. Blau (1980) "Sliding Wear of Metals," *Materials Engineering*, Vol. **92**, p. 56.
- F. Smidt and P. J. Blau, ed. (1988) Engineered Materials for Advanced Friction and Wear Applications, ASM International, Metals Park, OH.
- P. J. Blau (1990) "Wear-Resistant Materials in the 90's," invited article: Advanced Materials and Processes, Technology Forecast Issue, Vol. **137** (1), pp.25-26.
- P. K. Rohatgi, P. J. Blau, and C. S. Yust, ed.(1990) Tribology of Composite Materials, ASM, Materials Park, OH.
- R. Divakar and P. J. Blau, ed.(1992) Wear Testing of Advanced Materials, ASTM Spec. Tech. Pub. 1167, ASTM, Philadelphia.
- P. J. Blau (1992) Volume Chairman/Organizer, ASM Metals Handbook, 10th Ed., Vol. **18**, Friction, Lubrication, and Wear Technology, ASM Materials Park, Materials Park, OH.
- P. J. Blau (1997) "Fifty Years of Research on the Wear of Metals," invited paper for *Tribology International* special issue on metals, Vol. **30** (5), pp. 321-331.
- P. J. Blau (2000) section editor for "Friction, Wear and Surface Testing," ASM Handbook Vol. 8, ASM International, Materials Park, OH
- P. J. Blau (2001) guest editor, *Tribology International*, Special Issue on Friction Test Methods for Research and Application, Vol. **34** (9).
- P. J. Blau, (2006) "The Origins of Subsurface Layers Below Tribological Contacts: A Historical Perspective on Research and Understanding," *Materials Science and Technology–Assoc. for Iron and Steel Tech.*, Vol., 2, p. 437.

- P. J. Blau (2010) "Elevated Temperature Tribology of Metallic Materials," *Trib. International*, Vol. 43, pp. 1203-1208.
- P. J. Blau (2013) Section editor ('Friction') and contributor to, *Encyclopedia of Tribology*, ed. Q. J. Wang, Y.-W. Chung, Springer Pub.
- P. J. Blau, editor (2013) Proc. 19<sup>th</sup> International Conference on Wear of Materials, *Wear*, Vol. 301 (1-2) (2013).

#### 4. Friction and Wear – Test Methods, Techniques, and Standards

- T. M. Ahn, P. J. Blau, K. L. Hsu, D. A. Rigney, and J. D. Schell (1979) "Metallographic Techniques for Wear Test Specimens," *Wear*, Vol. 56, p. 409.
- P. J. Blau (1980) "Application of Metallographic Techniques to Study Metallic Wear Mechanisms," *Microstructural Science*, Vol. 8, p. 369.
- P. J. Blau (1981) "A Simple Method for Cross-sectional examination of wear flakes," *Wear*, Vol. 66, p. 257.
- P. J. Blau (1985) "Wear Testing and Standardization," *ASTM Standardization News*, October, p. 34
- P. J. Blau and C. S. Yust (1992) "Sliding Wear Testing and Data Analysis Strategies for Advanced Engineering Ceramics," in *Selection and Use of Wear Test Methods for Advanced Materials*, ed. R. Divakar and P. J. Blau, ASTM Spec. Tech. Pub. 1167, ASTM, Philadelphia, pp. 161-170.
- P. J. Blau (1998) "Wear Testing" in *ASM Handbook*, Desk Edition, 2<sup>nd</sup> ed., ASM, Materials Park, Ohio, pp.1342-1347.
- E. P. Whittenton and P. J. Blau (1988) "A Comparison of Methods for Determining Wear Volumes and Surface Parameters of Spherically-Tipped Sliders," *Wear*, Vol. 124, pp. 291-309.
- P. J. Blau (1989) "The Units of Wear-Revisited," *Lubrication Engineering*, Vol. 45 (10) pp. 609-614.
- P. J. Blau (1993) "A Retrospective Survey of the Use of Simulative Laboratory Tests to Address Internal Combustion Engine Tribology Problems," in *Wear Test Selection for Design and Application*, ASTM STP 1199, ed. A. W. Ruff and R. G. Bayer, ASTM, West Conshohocken, PA.
- P. J. Blau (1997) "Needs and Challenges in Precision Wear Measurement," *ASTM Journal of Testing and Evaluation*, Vol. 25 (2), pp. 216-225.
- C. S. Yust and P. J. Blau (1997) "Precision Profilometry of Wear Scars on Curved Surfaces," *ASTM Journal of Testing and Evaluation*, Vol. 25 (2), pp. 246-249.
- P. J. Blau (1997) "Design and validation of laboratory-scale simulations for selecting tribomaterials and surface treatments," invited paper, *New Directions in Tribology*, ed. I. M. Hutchings, Mech. Engr. Pub., Ltd., Suffolk, UK.
- P. J. Blau (1998) "Development of Bench-Scale Test Methods for Screening Aluminum P/M Alloys for Wear Resistance," Proc. Powder Metallurgy Aluminum and Light Alloys Conference, ed. W. F. Jandeska and R. Chernenkoff, Metal Powder Industries Federation, Princeton, NJ, pp. 97-106.
- P. J. Blau and K. G. Budinski (1999) "Development and Use of ASTM Standards for Wear Testing," *Wear*, Vol. 225-229, pp. 1159-1170.
- R. B. Dinwiddie and P. J. Blau (1999) "Time-Resolved Tribo-Thermography," THERMOSENSE XXI, eds. D. H. LeMieux and J. R. Snell Jr., SPIE Vol. 3700, p358-68.
- P. J. Blau (2001) "Simulative Friction and Wear Testing," Chapter 14 in *Handbook of Modern Tribology*, Vol. 1, ed. B. Bhushan, CRC Press, Boca Raton, Florida, pp. 511-522.
- P. J. Blau (2001) "Simulation of Cylinder Bore Surface Finish Parameters to Improve Laboratory-Scale Friction Tests in New and Used Oil," in *Engine Systems: Lubricants, Components, Exhaust and Boosting System, Design and Simulation*, Amer. Soc. of Mech. Engr., New York, ASME ICE Vol. 37-3, pp. 57-63.
- P. J. Blau (2001) "A Review of Sub-Scale Test methods to Evaluate the Friction and Wear of Ring and Liner Materials for Spark- and Compression-Ignition Engines," Oak Ridge National Lab., Technical Report, ORNL/TM-2001/184, 19 pp.
- J. Qu, P. J. Blau, A. J. Shih, S. B. McSpadden, G. M. Pharr, J. Jang (2004) "Scanning Acoustic Microscopy for Non-Destructive Evaluation of Subsurface Characteristics," Proceedings of the 6th International Conference on Frontiers of Design and Manufacturing, Paper# 435, Xi'an, China, Jun. 21-23, 2004.
- J. Qu, John J. Truhan, P. J. Blau (2005) "Application of the ASTM Loop Abrasion Test to Cylindrical Specimens," *ASTM J. of Testing and Evaluation*, Vol. 33, No. 1, Jan. 2005, JTE12508, pp. 527-531.
- J. Qu, J. J. Truhan, P. J. Blau (2005) "Detecting the Onset of Localized Scuffing with the Pin-on-Twin Fuel-Lubricated Test for Heavy Duty Diesel Fuel Injectors," *SAE International Journal of Engine Research*, Vol. 6, No. 1, Mar. 2005, pp. 1-9.
- J. J. Truhan, J. Qu, P. J. Blau (2005) "A Rig Test to Measure Friction and Wear of Heavy Duty Diesel Engine Piston Rings and Cylinder Liners using Realistic Lubricants," *Tribology International*, Vol 38 (3), pp 211-218.
- J. Qu, J. J. Truhan, P. J. Blau, (2005) "Detecting the Onset of Localized Scuffing with the Pin-on-Twin Fuel-Lubricated Test for Heavy Duty Diesel Fuel Injectors," *SAE Inter'1, J. of Engine Research*, Vol. 6, No. 1, Mar. 2005, pp. 1-9.
- J. Qu, J. J. Truhan, P. J. Blau (2005) "Evaluating Candidate Materials for Heavy Duty Diesel Fuel Injectors Using a 'Pin-On-Twin' Scuffing Test," *Tribology International*, Vol. 38, No. 4, pp. 381-390.

- P. J. Blau (2007) "Prospects for Adapting Current ASTM Wear and Erosion Tests for Bulk Materials to Thin Films, Coatings, and Surface Treatments," *J. of ASTM International*, Vol. 4 (10), Paper JAI 101177, 10 pp. (online).
- J. Qu, P. J. Blau and V. K. Sikka (2007) "Measurement of the Resistance of Treated Metal Foils to Scrubbing Abrasion Using a Modified Reciprocating Wear Test," *J. of ASTM International*, Vol. 4(8), Sept. Paper JAI 101294, available on line at [www.astm.org](http://www.astm.org).
- P. J. Blau, M. Yao, J. Qu, and J. Wu (2009) "Use of Multiple Criteria to Map the High-Temperature Scuffing Behavior of Co-Based Superalloys," *Wear*, Vol. 267, pp. 374-379.
- P. J. Blau, J-P. Celis, and D. Drees, ed. (2013) "Tribo-Corrosion: Research, Testing, and Applications," ASTM STP 1563, ed., ASTM International, West Conshohocken, PA. 226 pp.
- P. J. Blau and R. R. Dehoff (2013) "Development of a two-body wet abrasion test method with attention to the effects of reused abradant," *Wear*, Vol. 302 (1-2), pp 1035-1039.

## 5. Friction and Wear – Transitions including Running-in

- P. J. Blau (1981) "Interpretations of the Break-in Behavior of Metals in Sliding Contact," *Wear*, Vol. 71, p. 29.
- P. J. Blau (1981) "Mechanisms for Transitional Friction and Wear Behavior of Sliding Metals," *Wear*, Vol. 72, p. 55.
- P. J. Blau (1981) "An Investigation of the Unlubricated Friction and Wear Break-in Behavior of a Dual-Phase Steel," *Wear*, Vol. 72, p. 67.
- P. J. Blau (1981) "Observations of the Wear-in Process During the Sliding of Several Copper Alloys on 52100 Steel," *Proc. ASME Wear of Materials Conference*, ASME, NY, p. 69.
- P. J. Blau (1981) "Studies of Friction Transients During the Break-in of Sliding Metals," *Proc. 8<sup>th</sup> Leeds-Lyon Conference in Tribology*, Butterworths, Surrey, England, p. 175.
- P. J. Blau and E. P. Whinton (1981) "A Study of the Mechanisms Involved in the Unlubricated Break-in Behavior of 52100 Steel on an Al-Si-Cu Alloy," *Tribology International*, Vol. 15 (4), p. 209.
- P. J. Blau (1982) "Monitoring the Sliding Conditions in Laboratory Wear Tests Using Time-Dependent Variations in Friction Coefficients," *Proc. 35<sup>th</sup> Mech. Failures Prevention Group*, Cambridge U. Press, p. 145.
- P. J. Blau and E. P. Whinton (1984) "The Effect of Flat-on-Ring Sample Alignment on the Sliding Friction Break-in Curves for Aluminum Bronze on 52100 Steel," *Wear*, Vol. 94, p. 201.
- P. J. Blau and C. D. Olson (1985) "An Application of Thermal Wave Microscopy to Research on the Sliding Wear Break-in Behavior of a Cu - 15 wt% Zn Alloy," *Proc. ASME Wear of Materials Conference*, ASME, NY, p. 424.
- P. J. Blau (1987) "A Model for Run-in and Other Transitions in Sliding Friction," *J. of Tribology*, Vol. 109, p. 537-544.
- P. J. Blau (1987) "Effects of Sliding Motion and Tarnish Films on the Break-in Behavior of Three Copper Alloys," *Proc. ASME Wear of Materials Conference*, ASME, NY, p. 93.
- P. J. Blau, E. P. Whinton, and A. Shapiro (1988) "Initial Frictional Behavior During the Wear of Steel, Aluminum, and Poly (Methylmethacrylate) on Abrasive Papers," *Wear*, Vol. 124 (1), pp. 1-20.
- P. J. Blau and C. E. DeVore (1989) "Interpretations of the Sliding Friction Break-in Curves of Alumina-Aluminum Couples," *Wear*, Vol. 129, pp. 81-92.
- P. J. Blau and C. E. DeVore (1989) "Effect of Temperature on the Break-in Characteristics of Nickel Aluminide Alloys," *Proc. ASME Wear of Materials Conference*, ASME, NY, p. 305.
- P. J. Blau (1989) *Friction and Wear of Materials: Break-in, Run-in, and Wear-in*, Noyes Pub., Park Ridge, NJ., 476 pp.
- P. J. Blau (1991) "Running-in: Art or Engineering," *J. Mater. Engr.*, Vol. 13, p. 47.
- P. J. Blau (2005) "On the nature of running-in," invited paper for a special issue of *Tribology International*, Vol. 38 (11-12), pp. 1007-1012.

## 6. Indentation Hardness and Scratch Testing

- P. J. Blau (1979) "The Use of Knoop Indentations for Measuring Microhardness Near Worn Surfaces," *Scripta Met.*, Vol. 13, p. 95.
- P. J. Blau (1980) "Use of a Two-Diagonal Measurement Method for Reducing Scatter in Microhardness Testing," *Scripta Met.*, Vol. 14, p. 719.
- P. J. Blau (1985) "The Relationship Between Scratch and Knoop Microindentation Hardness and Implications for the Abrasive Wear of Metals," *Microstructural Sci.*, Vol. 12, p. 293.
- P. J. Blau and B. R. Shives (1985) "Microindentation Hardness Testing," *ASTM Standardization News*, January, p. 47.
- P. J. Blau and B. R. Lawn, ed. (1985) *Microindentation Techniques in Materials Science and Engineering*, ASTM Spec. Tech. Pub. 889, Philadelphia, PA.
- P. J. Blau (1985) "Applications of Microindentations in Tribology Research," in *Microindentation Techniques in*

Materials Science and Engineering, ed. P. J. Blau and B. R. Lawn, ASTM Spec. Tech. Pub. 889, Philadelphia, PA, p. 209.

- P. J. Blau (1986) "Microindentation Hardness Testing of Coatings," in Physics and Chemistry of Protective Coatings, ed. W. D. Sproul, J. E. Greene, and J. A. Thornton, Am. Inst. of Physics, NY, p. 1.
- P. J. Blau (1986) "Methods and Applications of Microindentation Hardness Testing," in the Handbook of Applied Metallography, ed. G. vander Voort, Van Nostrand Reinhold, New York, p. 123.
- P. J. Blau, W. C. Oliver, and L. Snead (1997), "The Scanning Micro-Sclerometer: A New Method for Scratch Hardness Mapping," invited paper for the special issue of *Tribology International* on 'Scratch Testing,' Vol. **30** (7) pp. 483-490.
- P. J. Blau (1992) "Microindentation Hardness Testing," in the ASM Metals Handbook, 10th Ed., Vol. **18**, Friction, Lubrication, and Wear Technology, ASM Materials Park, Materials Park, OH.
- P. J. Blau, R. L. Jackson, and J. R. Keiser (1993) "A comparison of three microindentation hardness scales at low and ultra-low loads," *Materials Characterization*, Vol. **30**, pp. 287-293.
- P. J. Blau (2000) Lab Handbook of Microindentation Hardness Testing, Blue Rock Tech. Pub., Oak Ridge, TN, 80 pp.
- L. Riester, P. J. Blau, E. Lara-Curzio and K. Breder (2000) "Nanoindentation with a Knoop Indenter," *Thin Solid Films* Vol. **377-378**, 635-639.
- P. J. Blau (2002) Lab Handbook of Scratch Testing, Blue Rock Tech. Pub., Oak Ridge, TN, 90 pp.

## 7. Lubricants

- E. L. Bird, P. J. Blau and C. E. DeVore (1991) "Evaluation of High Temperature Lubricants Used in Uranium Metalworking Operations," Proc. ASME Wear of Materials Conference, ASME, New York, p. 547.
- J. Qu, John J. Truhan, S. Dai, H. Luo, and P. J. Blau (2006) "Ionic Liquids with Ammonium Cations as Lubricants or Additives," *Tribology Letters*, Vol. 22, No. 3, Jun. 2006, pp. 207-214.
- Jun Qu, Peter J. Blau, Jane Y. Howe, Harry M. Meyer III (2009) "Oxygen diffusion enables anti-wear boundary film formation on titanium surfaces in zinc-dialkyl-dithiophosphate (ZDDP)-containing lubricants," *Scripta Materialia*, Vol. 60, Issue 10, May, pp. 886-889.
- J. Qu, P. J. Blau, S. Dai, H. Luo, H. M. Meyer III, and John J. Truhan (2009) "Tribological characteristics of aluminum alloys sliding against steel lubricated by ammonium and imidazolium ionic liquids," *Wear*, Vol. 267, Issues 5-8, pp 1226-1231.
- J. Qu, P. J. Blau, S. Dai, H. Luo, and H. M. Meyer III (2009) "Ionic Liquids and Novel Lubricants and Additives for Diesel Engine Applications," *Tribology Letters*, Vol. 35, pp. 181-189.
- J. Qu, M. Chi, H. M. Meyer III, P. J. Blau, S. Dai, and H. Luo (2011) "Nanostructure and Composition of tribo-Boundary Films Formed in Ionic Liquid Lubrication," *Tribology Letters*, Vol. 43, pp. 205-211.
- B. Yu, D. G. Bansal, J. Qu, X. Sun, H. Luo, S. Dai, P. J. Blau, B. G. Bunting, G. Mordukhovich, D. J. Smolenski (2012) "Oil-miscible and non-corrosive phosphonium-based ionic liquids as candidate lubricant additives," *Wear*, Vol. 289, pp. 58-64.
- J. Qu, D. Bansal, B. Yu, J. Howe, H. Luo, S. Dai, H. Li, P. Blau, B. Bunting, G. Mordukhovich, and D. Smolenski (2012), "Anti-Wear Performance and Mechanism of an Oil-Miscible Ionic Liquid as a Lubricant Additive" *ACS Applied Materials & Interfaces*, Vol 4(2), pp. 997-1002.
- J. Qu, H. Luo, M. Chi, C. Ma, P. J. Blau, S. Dai, and M. B. Viola (2014) "Comparison of an oil-miscible ionic liquid and ZDDP as a lubricant anti-wear additive," *Trib. Intern.*, Vol. 71, pp. 88-97.

## 8. Machining, Surface Quality, and Friction Drilling

- P. J. Blau (1992) "The Cost-Effective Ceramic Machining Program Plan," in Proc. Ann. Auto. Tech. Dev. Contractors' Coord. Meeting 1991, S.A.E., Warrendale, PA, pp. 425-432.
- P. J. Blau (1992) "Report on the Planning Workshop on Cost-Effective Ceramic Machining," Oak Ridge National Lab., Report M/1745, 66 pp.
- J. A. Kovach, S. Srinivasan, P. J. Blau, B. Bandyopadhyay, S. Malkin, and K. Zeigler (1993) "A Feasibility Investigation of High Speed, Low Damage Grinding for Advanced Ceramics," SME Technical Paper, MR93-352; and published in Proc. SME 5th International Grinding Conf., Cincinnati, Ohio, October 26-28.
- P. J. Blau, R. L. Martin, and L. Riester (1996) "A Comparison of Several Surface Finish Measurement Methods as Applied to Ground Ceramic and Metals Surfaces," ORNL Technical report, ORNL/M-4924, 28 pp.
- E. S. Zanoria, T. R. Watkins, K. Breder, M. Bashkansky, J. Reijntjes, J. G. Sun, W. A. Ellingson, and P. J. Blau (1998) "Assessment of Techniques for Characterizing the Surface Quality of Ground Silicon Nitride," *J. of Mat'ls. Engr*

and Performance, Vol. 7(4), pp. 533-47.

- P. J. Blau and E. S. Zanoria (1999) "Use of a Two-Body Abrasion Test to Measure the Grindability of Advanced Ceramic Materials," in *Wear Processes in Manufacturing*, ed. D. Bahadur and J. Magee, ASTM STP 1362, ASTM West Conshohocken, PA, pp. 3-12.
- S. F. Miller, P. J. Blau, and A. Shih (2005) "Microstructural Alterations Associated with Friction Drilling of Steel, Aluminum, and Titanium," *J. of Materials Engineering and Performance*, Vol. 14 (5), pp. 647-653.
- S. Miller, P. J. Blau, and A. Shih (2006) "Tool Wear in Friction Drilling," *International Journal of Machine Tools and Manufacture*, Vol. 47 (10), pp. 1636-1645.
- T. W. Liao, G. Hua, J. Qu, P. J. Blau (2006) "Grinding Wheel Condition Monitoring with Hidden Markov Model-Based Clustering Methods," *Machining Science and Technology*, Vol. 10 (No. 4), pp. 511-538.
- T. W. Liao, C. F. Ting, C.F., J. Qu, P. J. Blau (2007) "A Wavelet-Based Methodology for Grinding Wheel Condition Monitoring," *International Journal of Machine Tools & Manufacture*, Vol. 47 (No. 3-4), pp. 580-592.
- R. Li, L. Riester, T. R. Watkins, P. J. Blau, and A. Shih (2007) "Metallurgical analysis and nanoindentation characterization of Ti-6Al-4V workpiece and chips in high through-put drilling," *Mat. Sci. and Engr.*, Vol. A 472, pp. 115-124.
- P. J. Blau, B. C. Jolly, J. Qu, and D. Paxton (2007) "Feasibility of Thermally Drilling Automotive Alloy Sheet, Castings, and Hydroformed Shapes," ORNL Tech Report, ORNL/TM-2007/32, 53 pp.
- J. Qu and P.J. Blau (2008) "A New Model to Calculate Friction Coefficients and Shear Stresses in Thermal Drilling", *ASME J of Mfg Sci and Engr*, Vol 130, February, paper 014502-1. 4 pp online.
- W. Li, P. J. Blau, J. Qu, S. J. Park, Y. Hammi, and R. M. German (2008) "Prediction of Tool Wear and Tool Life by Experiment/Modeling/Simulation of the Die Compaction Process," *Proceedings of the 2008 World Congress on Powder Metallurgy & Particulate Materials (World Congress PM 2008)*, Part 1. Design & Modeling of PM Materials, Components & Processes, ed R. Lawcock, A. Lawley, and P. J. McGeehan, Metal Powder Industries Federation, Princeton, NJ, pp. 64-77.
- P. J. Blau and B. C. Jolly (2008) "Relationships Between Abrasive Wear, Hardness, and Grinding Characteristics of Titanium-Based Metal-Matrix Composites," *J. of Materials Engrg and Performance*, Vol. 18(4), pp. 424-432.

## 9. Meteoritics and Lunar Science

- P. J. Blau, H. J. Axon, and J. I. Goldstein (1973) "Investigation of the Canyon Diablo Metallic Spheroids and Their Relationship to the Break-up of the Canyon Diablo Meteorite," *J. of Geophys. Res.*, Vol. 78(2), p. 363.
- J. I. Goldstein and P. J. Blau (1973) "Chemistry and Thermal History of Metal Particles in Lunar Soils," *Geochim. et Cosmochim. Acta*, Vol. 37, p. 847.
- P. J. Blau (1973) "Investigation and Simulation of Metallic Spherules from Lunar Soils," M. S. Thesis, Lehigh University, Bethlehem, PA, 172 pp.
- P. J. Blau and J. I. Goldstein (1975) "Investigation and Simulation of Metallic Particles from Lunar Soils," *Geochim. et Cosmochim. Acta*, Vol. 39, p. 305.

## 10. Materials Engineering – Non-tribology

- P. J. Blau (1975) "Effect of Iron and Silicon Content on the Fracture Toughness of 7X75 and Zr-modified 7X75 Aluminum Plate," Air Force Materials Lab. report, AFML-TM-LL-75-10, 10 pp.
- P. J. Blau and T. M. F. Ronald (1975) "Thermomechanical Processing of High-Strength Aluminum Alloys: 1975 Overview," Air Force Materials Lab. report, AFML-TM-LL-75-12, 4 pp.
- P. J. Blau (1975) "Effects of Purity and Processing on the Exfoliation Corrosion Behavior of 7X75 and Zr-modified 7X75 Aluminum Plate," Air Force Materials Lab. report, AFML-TM-LL-75-43, 14 pp.
- P. J. Blau (1975) "Influence of Iron and Silicon Content on the Tensile Properties of 7X75 and Zr-modified 7X75 Aluminum Plate," Air Force Materials Lab. report, AFML-TM-LL-75-140, 29 pp.
- P. J. Blau (1975) "Effect of Iron and Silicon Content on Stress Corrosion Cracking in Thermomechanically-Processed Aluminum Alloy," Air Force Materials Lab. report, AFML-TM-LL-75-215, 34 pp.
- P. J. Blau (1975) "Measurement of Stress Corrosion Cracks in Aluminum Alloy DCB Specimens Using an Ultrasonic Pulse Echo Technique," Air Force Materials Lab. report, AFML-TM-LL-75-200, 33 pp.
- P. J. Blau (1976) "Observations on the Distribution of Iron and Silicon Particles in a High Strength Aluminum Alloy," *Metallography*, Vol. 9(3), p. 257.
- P. J. Blau (1976) "Observations of Stress Corrosion Crack Front Bow-out in High-Strength Aluminum Alloy Double Cantilever Beam Specimens," *Metallurgical Trans.*, Vol. 7A, p. 473.

- P. J. Blau (1978) "Preliminary Calculations of Friction-Induced Deformation in Gold and Gold-Alloy Sliding Surfaces," Air Force Materials Lab. report, AFML-MB-TM-78-03, 8 pp.
- P. S. Korinko, M. J. Pechersky, D. L. Zecha, G. J. McKinney, L. Reister, P. Blau, E. Lara-Curzio (2001) "Characterization of Confined Pinch Welds in Type 304L Stainless Steel," Trends in Welding Research, Proceedings from the 6th International Conference", ASM International, Materials Park, OH.
- P. J. Blau, J. Y. Howe, D. W. Coffey, R. M. Trejo, E. D. Kenik, B. C. Jolly and N. Yang (2012) "Microstructure, Morphology, and Nanomechanical Properties Near Fine Holes Produced by Electro-Discharge Machining," *J. of Materials Engineering and Performance*, Vol. 21, Issue 8, pp. 1744-1750.

## 11. Terminology and Definitions

- P. J. Blau (1985) "Tribology Terminology," *ASTM Standardization News*, May, p. 15
- P. J. Blau (1992) "Glossary of Friction, Lubrication, and Wear Terms," in the ASM Metals Handbook, 10th Ed., Vol. **18**, Friction, Lubrication, and Wear Technology, ASM Materials Park, Materials Park, OH.
- P. J. Blau (1994) "The Terminology of Friction, Lubrication, and Wear," in Tribology in the USA and the Former Soviet Union, ed. V. A. Belyi, K. C. Ludema, and N. K. Myshkin, Allerton Press, New York, pp. 431-442. Published in Russian and English versions.

## 12. Wear - Sliding and abrasion of specific materials

- P. J. Blau (1979) "Interrelationships Among Wear, Friction, and Microstructure in the Unlubricated Sliding of Copper and Several Single-Phase Binary Copper Alloys," Ph.D. Dissertation, The Ohio State U., Columbus, OH, 341 pp
- P. J. Blau (1983) "Competition Between Wear Processes During the Dry Sliding of Copper Alloys on 52100 Steel," Proc. ASME Wear of Materials Conference, ASME, NY, p. 526.
- P. J. Blau (1984) "Investigation of Microindentation Hardness Gradients Below Sliding Contacts in Five Copper Alloys Worn Against 52100 Steel," *J. of Materials Sci.*, Vol. **19**, p. 1957.
- P. J. Blau (1984) "Effect of Heat Treatment and Electron-Beam Surface Melting on the Friction and Wear Behavior of a Cu-12 wt% Al Alloy," *Wear*, Vol. **91**, p. 1.
- P. J. Blau (1985) "Measurements and Interpretations of Sliding Wear Damage in Metals," *J. of Tribology*, Vol. **107**, p. 483.
- P. J. Blau and A. D. Doyle (1987) "Metallographic Evidence for the Nucleation of Subsurface Microcracks During Unlubricated Sliding of Metals," *Wear*, Vol. **117**, p. 381.
- P. J. Blau and C. E. DeVore (1988) "A Study of the Friction and Wear-Related Properties of Ceramic Superconductors," in Engineered Materials for Advanced Friction and Wear Applications, ed. F. Smidt and P. J. Blau, ASM International, Materials Park, OH.
- P. J. Blau and C. E. DeVore (1988) "Sliding Behavior of Alumina/Nickel and Alumina/ Nickel Aluminide Couples at Room and Elevated Temperatures," *J. of Tribology*, Vol. **110**, pp. 646-652.
- P. J. Blau (1989) "The Sliding Friction and Wear Behavior of Several Nickel Aluminide Alloys Under Dry and Lubricated Conditions," *Tribology International*, Vol. **23** (4), pp. 226-234.
- P. J. Blau, C. S. Yust, L. Heatherly, and R. E. Clausing (1990) "Morphological Aspects of the Friction of Hot-Filament Grown Diamond Thin Films," The Mechanics of Coatings, Elsevier Pub., p. 399.
- P. J. Blau (1990) "Friction Microprobe Studies of Composite Surfaces," Proc. of ASM International Conference on Tribology of Composite Materials, ed. P. K. Rohatgi, P. J. Blau, and C. S. Yust, ASM, Materials Park, OH.
- P. J. Blau and C. E. DeVore (1991) "Machining and Wear Relationships in an Ordered Intermetallic Alloy," *Wear*, Vol. **149**, pp. 27-40.
- P. J. Blau (1991) "An Observation of Role Reversal Effects in Unlubricated Sliding Friction and Wear Tests of Alumina and Silicon Carbide," *Wear*, Vol. **151**, pp. 193-197.
- P. J. Blau and C. E. DeVore (1991) "Machining and Wear Relationships in an Ordered Intermetallic Alloy," Proc. ASME Wear of Materials Conference, ASME, New York, p. 547.
- E. H. Lee, M. B. Lewis, P. J. Blau, and L. K. Mansur (1991) "Improved surface properties of polymer materials by ion implantation," *J. Mater. Res.*, Vol. **6** (3), p. 610.
- P. J. Blau and C. E. Haberman (1992) "Investigation of the Micro-Frictional Behavior of C<sub>60</sub> Particle Layers on Aluminum," *Thin Solid Films*, Vol. **219**, pp. 129-134.
- P. J. Blau (1992) "Effects of surface preparation on the friction and wear behaviour of silicon nitride/silicon carbide sliding pairs," *J. of Materials Sci.*, Vol. **27**, pp. 4732-4740.
- P. J. Blau (1992) "Rolling Contact Wear," in the ASM Metals Handbook, 10th Ed., Vol. **18**, Friction, Lubrication, and

Wear Technology, ASM Materials Park, Materials Park, OH.

- P. J. Blau (1992) "Wear of Intermetallic Compounds Based on Ni<sub>3</sub>Al," in the ASM Metals Handbook, 10th Ed., Vol. **18**, Friction, Lubrication, and Wear Technology, ASM Materials Park, Materials Park, OH.
- S. R. Srinivasan and P. J. Blau (1994) "Effect of Relative Humidity on Repetitive Impact Behavior of Machined Silicon Nitride," *J. Amer. Ceram. Soc.*, Vol. **77** (3), pp. 683-688.
- P. J. Blau and T. A. Hanft (1994) "Quantitative measurement of repetitive impact damage on ground silicon nitride surfaces," *Tribology International*, Vol. **27** (2), pp. 109-118.
- Y. W. Bae, W. Y. Lee, T. M. Besmann, and P. J. Blau (1994) "Novel, self-lubricating, multi-phase coatings containing MoS<sub>2</sub> or TiS<sub>2</sub> for advanced tribological applications," submitted to *J. of Materials Research*.
- P. J. Blau and R. L. Martin (1994) "Friction and wear of carbon-graphite materials against metal and ceramic counterfaces," *Tribology International*, Vol. **27** (6), pp. 413-422.
- P. J. Blau (1994) "A Comparison of the Friction Behavior of Bulk Diamond with that of Diamond Films and Diamondlike Carbon Films," *Diamond Films and Technology*, Vol. **4** (3), pp. 1-12.
- G. R. Rao, P. J. Blau, and E. H. Lee (1995) "Friction microprobe studies of ion implanted polymer surfaces," *Wear*, Vol. **184**, pp. 213-222.
- P. J. Blau, C. S. Yust, Y. W. Bae, W. Y. Lee, and T. M. Besmann (1995) "Friction and Wear of Self-Lubricating Ceramic Coatings Produced by Chemical Vapor Deposition," ASTM Special Technical Publication 1278, Effect of Surface Coatings and Treatments on Wear, ed. S. Bahadur, ASTM, Philadelphia, PA. pp. 22-34.
- Y. W. Bae, W. Y. Lee, T. M. Besmann, and P. J. Blau (1995) "Nanoscale hardness and microfriction of titanium nitride films deposited from the reaction of tetrakis (dimethylamine) titanium with ammonia," *Appl. Phys. Letters*, Vol. **66** (15) pp. 1895-1896
- P. J. Blau and W. A. Simpson, Jr. (1995) "Applications of scanning acoustic microscopy in analyzing wear and single-point abrasion damage," *Wear*, Vol. **181-183**, pp. 405-412.
- Y. W. Bae, W. Y. Lee, C. S. Yust, P. J. Blau, and T. M. Besmann (1996) "Synthesis and Friction Behavior of Chemically Vapor Deposited Composite Coatings Containing Discrete TiN and MoS<sub>2</sub> Phases," *J. of the Amer. Cer. Society*, Vol. **79** (4), pp. 819-24.
- P. J. Blau and J. K. Gardner, Jr. (1996) "Tribological Characteristics of Graded Pencil Cores on Paper," *Wear*, Vol. **197**, pp. 233-241.
- Y. W. Bae, W. Y. Lee, T. M. Besmann, C. S. Yust and P. J. Blau (1996) "Preparation and friction characteristics of self-lubricating TiN-MoS<sub>2</sub> composite coatings," *Matls. Sci. and Engr.*, Vol. **A209**, pp. 372-76.
- P. J. Blau, R. L. Martin and E. S. Zanolria (1997) "Effects of surface grinding conditions on the reciprocating friction and wear behavior of silicon nitride," *Wear*, Vol. **203-204**, pp. 648-657.
- P. J. Blau, K. C. Ludema, S. K. Rhee, W. A. Glaeser, A. W. Ruff, S. Bahadur, R. G. Bayer, D. A. Rigney, O. Vingsbo, and J. Larsen-Basse (1997) "Birth and History of the International Conferences on Wear of Materials," *Wear*, Vol. **203-4**, pp. 1-10.
- S. C. Moulzolf, R. J. Lad, and P. J. Blau (1999) "Microstructural effects on the friction and wear of zirconia films in unlubricated sliding contact," *Thin Solid Films*, Vol. **347**, pp. 220-225.
- O. D. Greenwood, S. C. Moulzolf, P. J. Blau and R. J. Lad (1999) "The influence of microstructure on tribological properties of WO<sub>3</sub> thin films," *Wear* Vol. **232**, pp. 84-90.
- P. J. Blau, B. Dumont, D. N. Braski, T. Jenkins, E. S. Zanolria, and M. C. Long (1999) "Reciprocating Friction and Wear Behavior of a Ceramic Matrix Composite for Possible Use in Diesel Engine Valve Guides," *Wear*, Vol. **225-229**, pp. 1338-1349.
- B. Dumont, P. J. Blau, and G. M. Crosbie (2000) "Reciprocating Friction and Wear of Two Silicon Nitride-Based Ceramics Against Type 316 Stainless Steel," *Wear*, Vol. **238** (2), pp. 93-109.
- T. El-Raghy, P. Blau, and M. W. Barsoum (2000) "Effect of Grain Size on Friction and Wear Behavior of Ti<sub>3</sub>SiC<sub>2</sub>," *Wear*, Vol. **238** (2), pp. 125-130.
- P. J. Blau and M. Walukas (2000) "Sliding Friction and Wear of Magnesium alloy AZ91D Produced by Two Different Methods," *Tribology International*, Vol. **33**, pp. 573-579.
- P. J. Blau (2001) "Friction and Wear of a Zr-Based Amorphous Metal Alloy under Dry and Lubricated Conditions," *Wear*, Vol. **250**, 431-434.
- R. D. Ott, C. A. Blue, M. L. Santella, and P. J. Blau (2001) "The influence of heat treatment on the tribological performance of a high wear resistant high Si Al-Si alloy weld overlay," *Wear*, Vol. **251**, pp. 868-874.
- P. J. Blau (2001) "Friction and wear of a Zr-based amorphous metal alloy under dry and lubricated conditions," *Wear*, Vol. **250**, pp. 431-434.
- A. Datta, J. D. Carpenter, R. D. Ott and P. J. Blau (2002), "Tribological Characteristics of Electrolytic Coatings for Aluminum Engine Cylinder Lining Applications," Proc. Society of Automotive Engineers (SAE) Annual Meeting, March, SAE paper #2002-01-0490.
- P. J. Blau and R. G. Bayer, editors (2003) Proceedings of the 14<sup>th</sup> International Conference on Wear of Materials, *Wear*,



Vol. 255 (1-6).

- J. Qu, P. J. Blau, J. Klett, and B. C. Jolly (2004) "Sliding Friction and Wear Characteristics of Novel Graphitic Foam Materials," *Tribology Letters*, 17(4), pp. 879-886.
- P. J. Blau and S. J. Shaffer, editors (2005) Proceedings of the 15<sup>th</sup> International Conference on Wear of Materials, *Wear*, Vol. 259 (1-6).
- J. Qu, P. J. Blau, and N. S. Kulkarni (2005) "Unusual Sliding Friction and Wear Behavior of Titanium Alloys against Metal, Polymer, and Ceramic Counterfaces," *Wear*, Vol. 258, No. 9, Apr. 2005, pp. 1348-1356.
- J. Qu, J. J. Truhan, P. J. Blau (2005) "Scuffing Transition Diagrams for Heavy Duty Diesel Fuel Injector Materials in Ultra Low-Sulfur Fuel-Lubricated Environment," *Wear*, Vol. 259, Part 2, pp. 1031-40.
- J. J. Truhan, J. Qu, P. J. Blau (2005) "The Effect of Lubricating Oil Condition on the Friction and Wear of Piston Ring and Cylinder Liner Materials in a Reciprocating Bench Test," *Wear*, Vol. 259, Part 2, pp. 1048-55.
- J. J. Truhan, R. Menon, and P. J. Blau (2005) "The Evaluation of Various Cladding Materials for Down-Hole Drilling Applications Using the Pin-on-Disk Test," *Wear*, Vol. 259, Part 2, pp. 1308-1313.
- P. J. Blau, J. Qu, and B. C. Jolly (2006) "Surface Engineering of Stainless Steel to Improve Wear Resistance without Sacrificing Corrosion Resistance," *Proc. 19th International Surface Modification Technologies*, ed. T. S. Sudarshan and J. Stiglich, ASM International, Materials Park, OH, pp. 30-35.
- J. Qu, P. J. Blau, B. C. Jolly (2007) "Improving wear-resistance without sacrificing corrosion-resistance for austenitic stainless steels by colossal carbon supersaturation," *Wear*, Vol. 263 (1-6), pp. 719-726.
- J. J. Truhan, R. Menon, F. LeClaire, J. Wallin, J. Qu, and P. J. Blau (2007) "The Friction and Wear of Various Hard-Face Claddings for Deep-Hole Drilling," *Wear*, Vol. 263 (1-6), pp. 234-239.
- C. C. Klepper, J. M. Williams, J. J. Truhan, J. Qu, L. Reister, R. C. Hazelton, J. J. Moschella, P. J. Blau, J. P. Anderson, O. O. Papoola, and M. D. Keitz (2008) "Tribo-mechanical properties of thin boron films deposited on polished cobalt alloy surfaces for orthopedic applications," *Thin Solid Films*, Vol. 516, pp. 370-380.
- J. Truhan, R. Menon, F. LeClaire, J. Wallin, J. Qu and P. Blau (2008), "Wear and Friction of Hardfaced Claddings," *World Oil Magazine*, 26-27 March, pub. online at [http://www.worldoil.com/Magazine/Magazine\\_Content.asp](http://www.worldoil.com/Magazine/Magazine_Content.asp)
- J. Qu, P. J. Blau, L. Zhang, and H. Xu (2008) "Effects of multiple treatments of low-temperature supercolossal supersaturation on tribological characteristics of austenitic stainless steels," *Wear*, Vol. 265 (No. 11-12), pp. 1090-1913.
- J. Qu, P.J. Blau, D. Zhu, B.A. Cook, A.A. Elmoursi (2008) "Tribological Characteristics of AlMgB<sub>14</sub> and Nanocomposite AlMgB<sub>14</sub>-TiB<sub>2</sub> Superhard Coatings," *Proceedings of IJTC2008 STLE/ASME International Joint Tribology Conference*, Miami, FL, Oct. 20-22, 2008.
- P. J. Blau and T. M. Brummett (2008) "High-Temperature Oxide Regrowth on Mechanically Damaged Surfaces," *Tribology Letters*, Vol. 32 (3), pp. 153-157.
- P. J. Blau, T. M. Brummett, and B. A. Pint (2009) "Effects of Prior Surface Damage on High-Temperature Oxidation of Fe-, Ni-, and Co-Based Alloys," *Wear*, Vol. 267 (1-4), pp. 380-386.
- M. Beltowski, P. J. Blau, and J. Qu (2009) "Wear of spheroidal graphite cast irons for tractor drive train components," *Wear*, Vol. 267, pp. 1752-1756.
- P. J. Blau (2009) "A Wear Model for Diesel Engine Exhaust Valves," ORNL Tech Report, ORNL TM 2009/259, 32 pp.
- W. Li, P. J. Blau, J. Qu, S. J. Park, and R. M. German (2010) "Tribological Behaviour of Die Tool Materials Used for Die Compaction in Powder Metallurgy," *Powder Metallurgy*, vol. 53, no. 3, pp. 251-259.
- P. J. Blau, L.R. Walker, H. Xu, R. Parten, J. Qu, and T. Geer (2010) "Wear Analysis of Wind Turbine Gearbox Bearings – Final report," ORNL Tech Report, ORNL TM 2010/059, March 31, 2010, 63 pp.
- A. M. Kovalchenko, P. J. Blau, J. Qu, and S. Danyluk (2011) "Scuffing tendencies of different metals against copper under non-lubricated conditions," *Wear*, Vol. 271, pp. 2998-3006.
- C. Higdon, B. Cook, J. Harringa, A. Russell, J. Goldsmith, J. Qu, and P. Blau (2011) "Friction and wear mechanisms in AlMgB<sub>14</sub>-TiB<sub>2</sub> nanocoatings," *Wear*, Vol. 271 (9-10), pp. 2111-2115.
- L. An, J. Qu, J. Luo, Y. Fan, L. Zhang, J. Liu, C. Xu, and P. J. Blau (2011) "Aluminum nanocomposites having wear resistance better than stainless steel," *J. of Matls Research*, Vol. 26 (19), pp. 2479-2483.
- D. G. Bansal, O. L. Eryilmaz, and P. J. Blau (2011) Surface engineering to improve the durability and lubricity of Ti-6Al-4V alloy, *Wear*, Vol. 271, 2006-2015.
- W. H. Peter, A. L. Liby, W. Chen, Y. Yamamoto, and P. J. Blau (2013) "Improved Processing of High Alloy Steels for Wear Components in Energy Generation Systems, Transportation and Manufacturing Systems, Final Report, ORNL/TM-2012/520, available through OSTI: ID 1095639. Date: 10/1/13, 44 pp.
- P. J. Blau, K. M. Cooley, and D. Bansal (2013) "Spectrum Loading Effects on the Running-in of Lubricated Bronze and Surface-Treated Titanium against Alloy Steel" *Wear*, Vol. 302 (1-2), pp. 1064-072.
- D. G. Bansal, M. Kirkham, and P. J. Blau (2013) "Effects of combined diffusion treatments and cold working on the sliding friction and wear behavior of Ti-6Al-4V," *Wear* Vol. 302 (1-2) pp. 847-844.

### 13. Wear - Fretting and Repetitive Impact

- S. Srinivasan and P. J. Blau (1995) "Effect of Machining Residual Stresses on the Repetitive Impact Behavior of Silicon Nitride," *J. of Materials Research.*, Vol. **10** (1), pp. 95-100
- E. S. Zanolari and P. J. Blau (1998) "Effect of Incidence Angle on the Impact Wear Behavior of Silicon Nitride," *J. Amer. Cer. Soc.*, Vol. **81** [4], pp. 901-909.
- E. S. Zanolari and P. J. Blau (1998) "Effects of Machined Surface Condition on the Repeated Impact Behavior of Silicon Nitride," *Wear*, Vol. **218**, pp. 66-77.
- P. J. Blau (2014) "A multi-stage wear model for grid-to-rod fretting of nuclear fuel rods," *Wear*, Vol. 313 (1-2), pp. 89-96. (<http://dx.doi.org/10.1016/j.wear.2014.02.016>)

### 14. Patents

- W. C. Oliver and P. J. Blau (1994) "Scanning Micro-Sclerometer," US Patent 5,359,879, Nov. 1.
- T. M. Besmann, P. J. Blau, W. Lee, and Y. Bae (1998) "Composite Coating for Low Friction and Wear Applications and Method Thereof," U.S. patent 5,709,936, Jan. 20
- T. M. Besmann, P. J. Blau, W. Lee, and Y. Bae (1998) "CVD Method of Forming Self-Lubricating Composites," U.S. patent 5,843,533, Dec 1. J. Qu, J. J. Truhan, S. Dai, H. Luo, P. J. Blau (2010) "Lubricants or Lubricant Additives Composed of Ionic Liquids Containing Ammonium Cations," U.S. Patent 7,754,664, July 13.

### 15. Standards Development – Participation and Coordination

- ASTM G133 Standard Test Method for Linearly Reciprocating Ball-on-Flat Sliding Wear," ASTM Annual Book of Standards, Vol. 03.02 (orig. approval 2002).
- ASTM G171 Standard Test Method for Scratch Hardness of Materials Using a Diamond Stylus, ASTM Annual Book of Standards, Vol. 03.02 (orig. approval 2003).
- ASTM G181 Standard Test Method for Conducting Friction Tests of Piston Ring and Cylinder Liner Materials Under Lubricated Conditions, ASTM Annual Book of Standards, Vol. 03.02 (orig. approval 2004).
- ASTM G206 Standard Guide for Measuring the Wear Volumes of Piston Ring Segments Run against Flat Coupons in Reciprocating Wear Tests, ASTM Annual Book of Standards, Vol. 03.02 (orig. approval 2011).