

Syed Sohail Akhtar, PhD

Assistant Professor, Mechanical Engineering
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Contact

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Qualifications Overview

- Experience in sophisticated research techniques and technologies: applications of finite element analysis, metal forming and other manufacturing processes, surface engineering and analysis, laser-assisted manufacturing and surface modification processes, material characterization and acquired useful knowledge and skill of various metallurgical study tools such as optical microscopy, SEM, XRD, microhardness measurement etc.
- Good knowledge and skill of various statistical, CAD/CAE and general-purpose computer packages
- Expertise in lab and field research, data collection/analysis.
- 02Published&03 pending patents, more than 50 refereed journal and conference papers.
- Presented papers internationally
- Regular reviewer of many international scientific journals.

Research Interests

Applied materials, Manufacturing and computational mechanics: Metal forming and other advanced manufacturing processes, Surface engineering, Laser assisted manufacturing and surface modification processes, Material characterization using modern techniques, Materials modeling using phase field method, Applications of finite element method in multi-physics problems

Teaching Interests

Materials and Manufacturing Processes (ME216, 217, ME 322, ME 323, ME 572); Machine Design (ME 308) ; Reliability Engineering and Probabilistic concepts in design and production (ME 462, ME 573); Analysis and Design of Engineering Experiments (ME 451); Finite Element Analysis and its applications in Manufacturing (ME 580, ME 586)

Education

- 1996, B.Sc. (with honors), Mechanical Engineering,
Department of Mechanical Engineering
N-W.F.P. University of Engineering & Technology (UET), Pakistan
- 2001, M.Sc., Mechanical Engineering (Mechanical Engineering Design)
Department of Mechanical Engineering
N-W.F.P. University of Engineering & Technology (UET), Pakistan
- 2009, PhD, Mechanical Engineering (Applied Materials & Manufacturing)
Department of Mechanical Engineering
King Fahd University of Petroleum & Minerals (KFUPM), Saudi Arabia

Employment History

- *February 2011 - present:*
Assistant Professor, Mechanical Engineering, KFUPM, Dhahran, Saudi Arabia
- *April 2009 - January 2011:*
Post-doc Fellow, Mechanical Engineering, KFUPM, Dhahran, Saudi Arabia
- *February 2004 - March 2009:*
Lecturer-B/PhD Studies, Mechanical Engineering, KFUPM, Dhahran, Saudi Arabia
- *August 2000 - January 2004:*
Junior Engineer, PAEC, Islamabad, Pakistan
- *June 1999 - July 2000:*
Assistant Manager (Manufacturing), Pakistan Ordnance Factories, Wah Cantt, Pakistan
- *May 1996- June 1996:*
Lecturer, N-W.F.P. University of Engineering & Technology (UET), Pakistan

Teaching

Teaching Overview

Since joining academia in 2004, I taught many undergraduate courses and a graduate course. The undergraduate courses covered all the levels from freshmen to senior years. These courses deal with design, materials and manufacturing. In addition, I have also developed an undergraduate course, ME-451 Analysis and design of Engineering experiments for the new curriculum of ME department KFUPM.

Courses Taught at KFUPM

- ME 322/323 Manufacturing Processes (Lectures and labs)
- ME 216/217 Material Science and Engineering(Lectures and labs)
- ME 308 Machine Design II
- ME 462 Reliability Engineering for Mechanical Engineers
- ME 451 Design & Analysis of Experiments
- ME 573 Probabilistic concepts in design and production

Course Development at KFUPM

ME 451: Analysis and Design of engineering Experiments (*developed and first time offered*)

Participation as instructor in Continuing Education Activities

- Evaluating Heat Exchanger Design and Installation (MEE 210), for Saudi ARAMCO Engineers, KFUPM, Saudi Arabia,December 29, 2012 - January 2, 2013

Senior Design Project Advising at KFUPM

I have supervised the following list of senior design projects

- Design & analysis of shearing die used in sheet metal forming
- Design for manufacturing of heat sink using advanced material for electronic cooling

Summer Training

I have evaluated two summer training reports (ME399) each year during last four years at KFUPM.

Coop Training Advising

I have advised the following list of students during the 28 weeks of industrial training for Applied Mechanical Engineering students (ME351) and the title of their reports is also given:

- Maintenance of Gas Turbine Systems in a Power Plant at Saudi Electric Company
- Operation and maintenance procedure of MED Desalination Plants
- Maintenance and repairing of gas turbine at GE
- General Electric equipments and different mechanical systems

Student Academic Advising

Every semester, I have advised approximately 25-30 students in their academic affairs.

Research

Research Overview

My research activities are in the broad area of materials and manufacturing, surface modification processes, applied computational mechanics and modeling of multi-physics problems. The current focus is on materials modeling using phase field method; Applications of finite element method in multi-physics problems; laser-assisted machining and surface modification of engineering materials & laser welding; and analysis & modeling of thermal barrier coatings. Past activities have included modeling and analysis of metal forming processes particularly hot extrusion dies with emphasis on die failure mechanisms, surface treatment and effect of billet quality on the die service life.

Funded Research Projects at KFUPM as a PhD Student and Faculty Member

Project Title & Team	Funding Agency	Duration	Status	Role
Die Life Improvement For Hot Extrusion Of Aluminum Alloys (KACST ARP-23-19); Team: A.F.M. Arif, A.K. Sheikh, Z. Gasem, S.S. Akhtar, M. Younas	KACST	11/2004-5/2007	Completed	PhD Student
Effect of Billet Quality on the Hot Extrusion Die Life (SB070023); Team: A.F.M. Arif, A.K. Sheikh, S. S. Akhtar	KFUPM /SABIC	5/2007-5/2008	Completed	PhD Student
Effect of Surface Preparation and profile Geometry on the Case-Hardening of H13 Tool Steel (SB080002) Team: A.F.M. Arif, A.K. Sheikh, S. S. Akhtar	KFUPM /SABIC	5/2008-5/2009	Completed	PhD Student
Laser gas Assisted Nitriding of Alumina Surfaces (SB100011) Team: B. S. Yilbas, S. S. Akhtar,	KFUPM /SABIC		Completed	Co-Investigator
Investigation into Laser Treatment of Zirconia Surface (SB101012) Team: B. S. Yilbas, S. S. Akhtar,	KFUPM /SABIC		Completed	Co-Investigator
Laser Surface Treatment of Phosphorous Bronze Team: B. S. Yilbas, S. S. Akhtar,	KFUPM /SABIC		In progress	Co-Investigator
Development of Optimization Guidelines for Extrusion Die Profiles with Improved Service-Life (SB111002)	KFUPM /SABIC		Completed	Principal Investigator

Team: S. S. Akhtar, A. F. M. Arif				
Performance Evaluation and Life Prediction Modeling of Industrial Gas Turbine Blade Coatings Used in Saudi Arabia (R9-CE-09) Team: (From KFUPM) A.F.M.Arif (PI), Z. Gasem, K. Alathel, S. S. Akhtar; (From MIT) L. Anand	KFUPM /MIT	9/2009-8/2013	In progress	Co- Investigator
Laser Cutting of Sharp Edge Geometries into Alumina Tiles: Thermal Stress Analysis (SB121012) Team: S. S. Akhtar, B. S. Yilbas	KFUPM /SABIC		In progress	Principal Investigator
Modeling and Analysis of Nitriding Process in AISI H13 Steel using Phase Field Approach Coupled with Finite Element Method (SB12101) Team: S. S. Akhtar, A. F. M. Arif	KFUPM /SABIC		In progress	Principal Investigator

Master Research Work

M.S. Thesis Supervised:

Abba Abdulhamid Abubakar, "", M.S. Thesis, Department of Mechanical Engineering, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia (In-progress).

M.S. Thesis Committee Member:

AbdulRahman Salman Al-Merbati, "Thermal Analysis of Thermoelectric Power Generator; including Thermal Stresses" M.S. Thesis, Department of Mechanical Engineering, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia, May 2012 (currently: pursuing Ph.D. in Mechanical Engineering at).

Gbadamosi, Aliyu Arisekola, "Evaluation of Fuel-additives to Mitigate Vanadium-induced Hot Corrosion in Thermal Barrier Coatings (TBC's)", M.S. Thesis, Department of Mechanical Engineering, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia (In-progress).

Khalid Naseem, " Modeling and simulation of spiral welding used for pipes", M.S. Thesis, Department of Mechanical Engineering, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia, (In-progress).

Muhammad Luqman, "Analysis and Modeling of Spark Plasma Sintering Process", M.S. Thesis, Department of Mechanical Engineering, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia (In-progress).

Publications

Archival Journal Publications

Under Review

1. **S. S. Akhtar**: Laser cutting of thick-section circular blanks: thermal stress prediction and microstructural analysis, submitted to *International Journal of Advanced Manufacturing Technology*
2. **S. S. Akhtar**, A. F.M. Arif: Effect of profile corners on the nitriding treatment of AISI H13 hot extrusion dies, submitted to *ASME Journal of Manufacturing Science and Engineering*
3. B.S. Yilbas and **S. S. Akhtar**, Laser Bending of Metal Sheet and Thermal Stress Analysis, *Part B: Journal of Engineering Manufacture*
4. B. S. Yilbas, **S. S. Akhtar**, O. Keles, Laser Cutting of Large Diameter Holes into Aluminum Foam, *Machining Science and Technology*
5. B.S. Yilbas, **S. S. Akhtar**, and C. Karatas , Laser Cutting of Different Diameter Holes in Alumina: Thermal Stress Analysis, *International Journal of Advanced Manufacturing Technology*
6. B. S. Yilbas, **S. S. Akhtar**, O. Keles , Laser Cutting of Small Diameter Hole in Aluminum Foam, *International Journal of Advanced Manufacturing Technology*

2013

7. **S.S. Akhtar**, B.S. Yilbas. E. Bayraktar: Thermal stress distributions and microstructure in laser cutting of thin Al-Si alloy sheet, *Journal of Laser Applications*, 25, 042006 (2013)
8. B. S. Yilbas, **S. S. Akhtar**, C. Karatas: "Laser cutting of alumina tiles: Heating and stress analysis" *Journal of Manufacturing Processes*, Volume 15, Issue 1, January 2013, Pages 14–24
9. B. S. Yilbas, **S. S. Akhtar**, C. Karatas: "Laser nitriding of the surface of phosphor bronze" *International Journal of Advanced Manufacturing Technology*, Volume 65, Issue 9-12, pp 1553-1565.
10. B. S. Yilbas, **S. S. Akhtar**, O. Keles: Laser cutting of triangular geometries in aluminum foam: Effect of cut size on thermal stress levels, *Optics and Laser Technology*, 48 , pp. 523-529, 2013
11. B. S. Yilbas, **S. S. Akhtar**, O. Keles: Laser hole cutting in aluminum foam: Influence of hole diameter on thermal stress, *Optics and Lasers in Engineering* 51 (1) , pp. 23-29, 2013
12. B. S. Yilbas, **S. S. Akhtar**, O. Keles, Laser Cutting of Aluminum Foam: Experimental and Model Studies, *ASME Journal of Manufacturing Science and Engineering*, Article in Press.

13. B.S. Yilbas and **S. S. Akhtar**, Laser Welding of AISI 316 Steel: Microstructural and Stress Analysis, *ASME Journal of Manufacturing Science and Engineering*,135(3), 031018, 2013
14. B.S. Yilbas, **S. S. Akhtar**, and C. Karatas, Laser Treatment of Rene-41: Thermal and Microstructural Analysis, *ASME Journal of Manufacturing Science and Engineering*135(3), 034502, 2013

2012

15. B. S. Yilbas, **S. S. Akhtar**, "Laser cutting of Kevlar laminates and thermal stress formed at cutting sections", *Optics and Lasers in Engineering*, Vol. 50 (2), pp. 204-209, 2012.
16. B. S. Yilbas, **S. S. Akhtar**, Karatas C., "Laser straight cutting of zirconia tiles", *Journal of Mechanical Science and Technology*, Volume 26, Number 2 (2012), 591-599.
17. **S. S. Akhtar**, A. F. M. Arif, B. S. Yilbas, " Influence of Multiple Nitriding on the Case Hardening of H13 Tool Steel: Experimental and Numerical investigation", *Int. J. Advanced Manufacturing Technology*, Volume 58, Numbers 1-4 (2012), pp. 57-70.
18. B. S. Yilbas, **S. S. Akhtar**, Karatas C., "Laser straight cutting of alumina tiles: thermal stress analysis", *Int. J. of Advanced Manufacturing Technology*, 58 (9-12), pp. 1019-1030 (2012).
19. B. S. Yilbas, **S. S. Akhtar**, C. Karatas: "Laser Gas Assisted Nitriding of Hastelloy-G alloy: Thermal Stress Analysis and Characterization" *Surface and Interface Analysis*, Volume 44, Issue 3, pages 352–364, March 2012.
20. B. S. Yilbas,**S. S. Akhtar**, C. Karatas: "Laser Hole Cutting into Ti-6Al-4V Alloy and Thermal Stress Analysis" *International Journal of Advanced Manufacturing Technology*, Volume 59, Numbers 9-12, 2012.
21. B. S. Yilbas, **S. S. Akhtar**, Matthews A., Karatas C., "Laser treatment of carbon film coated steel surface", *Surface Engineering*, Vol. 28 (1), pp. 57-67, 2012.
22. B. S. Yilbas, **S. S. Akhtar**, C. Karatas: "Laser Straight cutting of Bronze Sheet: Thermal Stress Analysis" *Machining Science and Technology*, Volume 16 (1), 2012, pp. 20-39.
23. Yilbas, B.S., **Akhtar, S.S.**, Bayraktar, E., Gasem, Z., "Laser cutting of thin aluminum and silicon alloy: Influence of laser power on kerf width, *Advanced Materials Research*, Vol. 445 , pp. 442-447, 2012.
24. B. S. Yilbas, **S. S. Akhtar**, C. Karatas , C. Chatwin, "Laser embedding of TiC particles into the surface of phosphor bronze-bearing material" *Surface and Interface Analysis*, 44 (7) , pp. 831-836, 2012
25. **S. S. Akhtar**, A. F. M. Arif, B.S. Yilbas: "Finite Element Simulation of the Effect of Al-6063 Billet Quality on the Extrusion Die Performance", *Industrial Lubrication Tribology*, accepted, to be published in 2013.
26. B. S. Yilbas, **S. S. Akhtar**, C. Karatas: "Laser surface treatment of pre-prepared Rene 41 surface" *Optics and Lasers in Engineering* 50 (11) , pp. 1533-1537, 2012

27. B. S. Yilbas, **S. S. Akhtar**: Laser re-melting of HVOF coating with WC blend: Thermal stress analysis, *Journal of Materials Processing Technology*, 212 (12) , pp. 2569-2577, 2012
28. B. S. Yilbas, A. Matthews, A. Leyland, C. Karatas, **S. S. Akhtar**, B. J. Abdul Aleem: Laser surface modification treatment of aluminum bronze with B4C, *Applied Surface Science*, 263 , pp. 804-809, 2012

2011

29. B. S. Yilbas, **S. S. Akhtar**, A. Matthews, C. Karatas: "Laser Remelting of Zirconia Surface: Investigation into Thermal Stresses" *Materials and Manufacturing Processes*, Volume 26, Issue 10, 2011, pages 1277-1287.
30. B. S. Yilbas, **S. S. Akhtar**, "Laser Cutting of Alloy Steel: 3-Dimensional Modeling of Temperature and Stress Fields" *Materials and Manufacturing Processes*, Volume 26, Issue 1, 2011, pages 104-112.
31. B. S. Yilbas, M. Khaled, **S. S. Akhtar**, C. Karatas: "Laser Bending of Steel Sheets: Corrosion Testing of Bended Sections", *Industrial Lubrication Tribology*, Vol. 63 Issue: 5, 2011, pp.367 – 372
32. B. S. Yilbas, **S. S. Akhtar**, and C. Karatas, "Laser carbonitriding of alumina surface", *Optics and Lasers in Engineering*, Vol. 49 (3), pp. 341-350, 2011.
33. B. S. Yilbas, **S. S. Akhtar**, Karatas C., "Laser welding of Hayness 188 alloy sheet: thermal stress analysis", *J. of Advanced Manufacturing Technology*, Vol 56 (1-4) pp. 115-124, 2011.
34. Yilbas B.S., Sahin A.Z., **Akhtar S.S.**, "Laser treatment of alumina surfaces: the first and second law analysis", *Int. J. of Surface Science and Engineering*, Volume 5, Number 2-3, pp. 116 – 130, 2011.
35. B. S. Yilbas, **S. S. Akhtar**, Karatas C., " Laser controlled melting of pre-treated zirconia surface, *Applied Surface Science*, Vol. 257(15), pp. 6912-6918, 2011.
36. B. S. Yilbas, **S. S. Akhtar**, Karatas C.," Laser trepanning of a small diameter hole in titanium alloy: temperature and stress fields", *J. of Materials Processing Technology*, Vol. 211 (7), pp. 1296-1304, 2011.
37. B. S. Yilbas, **S. S. Akhtar**, Karatas C.," Laser gas assisted treatment of pre-prepared high strength low alloy steel surface", *Journal of Materials Processing Technology*, 211 (7), pp. 1268-1277, 2011.
38. B. S. Yilbas, **S. S. Akhtar**, Chatwin C., Laser hole cutting into bronze: thermal stress analysis", *Optics and Laser Technology*, Vol. 43 (7), pp. 1119-1127, 2011.
39. B. S. Yilbas, **S. S. Akhtar**: "Laser Cutting of Small Diameter Holes into Alumina Tiles: Thermal Stress Analysis" *ASME Journal of Manufacturing Science and Engineering*, Volume 133, Issue 2, 024503 (5 pages), 2011.
40. B. S. Yilbas, **S. S. Akhtar**, A. Matthews, C. Karatas, A. Leyland: "Microstructure and Thermal Stress Distributions in Laser Carbonitriding Treatment of Ti-6Al-4V Alloy"

ASME Journal of Manufacturing Science and Engineering, Volume 133, Issue 2, 021013 (8 pages), 2011.

41. B. S. Yilbas, **S. S. Akhtar**, C. Karatas: "Laser gas assisted melting of pre-prepared alumina surface including TiC particles at surface" *Surface Engineering*, Volume 27, Number 6, July 2011 , pp. 470-476.

2010

42. B. S. Yilbas, **S. S. Akhtar**, C. Karatas: "Laser Treatment of Inconel 718 alloy: Thermal Stress Analysis" *Optics and Lasers in Engineering*, 2010, Vol. 48, pp. 740-749.
43. **S. S. Akhtar**, A. F. M. Arif, B. S. Yilbas: "Nitriding of Aluminum Extrusion Die: Effect of Die Geometry", *ASM Journal of Materials Engineering and Performance*, 2010, Vol. 9 (3), pp. 401-412.
44. **S. S. Akhtar**, A. F. M. Arif, B. S. Yilbas, A. K. Sheikh: "Influence of surface preparation on the kinetics of controlled gas-nitrided AISI H13 Steels used in extrusion dies", *ASM Journal of Materials Engineering and Performance*, 2010, Vol. 9 (3), pp. 347-355.
45. B. S. Yilbas, **S. S. Akhtar**, B.J. Abdul Aleem, and C. Karatas: "Laser Gas-Assisted Processing of Carbon Coated and TiC Embedded Ti-6Al-4V Alloy Surface", *Applied Surface Science*, 2010, Vol. 257, Issue 2, pp. 531-537.
46. **S. S. Akhtar**, A. F. M. Arif, and B. S. Yilbas: "Evaluation of gas nitriding process with in-process variation of nitriding potential for AISI H13 tool steel", *The International Journal of Advanced Manufacturing Technology*, 2010, Vol. 47 (5-8), pp. 687-698.
47. **S. S. Akhtar**, A. F. M. Arif, A. K. Sheikh: "Influence of Billet Quality on Hot Extrusion Die Life and its Relationship with Process Parameters", *Advanced Materials Research*, 2010, Vols. 83-86, pp. 866-873.
48. A. F. M. Arif, **S. S. Akhtar**, B.S. Yilbas: "Effect of process variables on gas nitriding of H13 tool steel with controlled nitriding potential" *International Journal of Surface Science & Engineering*, 2010 , Vol. 4 (4-6), pp. 396-415.
49. **S. S. Akhtar**, A. F. M. Arif: "Fatigue Failure of Extrusion Dies: Effect of Process Parameters and Design Features on Die Life" *ASM Journal of Failure Analysis & Prevention*, 2010, Vol. 10 (1), pp. 38-49.

2009

50. **S. S. Akhtar**, A. F. M. Arif, B. S. Yilbas: "Performance of Al-6063 Primary and Secondary Billets used in Hot Aluminum Extrusion", *ASME Journal of Manufacturing Science and Engineering*, October 2009, Vol. 131 (5), pp. 054502-1 to 054502-7.
51. A. F. M. Arif, **S. S. Akhtar**, A. K. Sheikh: "Effect of Al-6063 billet quality on the service life of hot extrusion die: metallurgical and statistical investigation", *ASM Journal of Failure Analysis & Prevention*, 2009, Vol. 9 (3), pp. 253-261.

52. B. S. Yilbas, A. F. M. Arif, C. Karatas, **S. S. Akhtar**, B. J. A. Aleem, "Laser Nitriding of Tool Steel: Thermal Stress Analysis", *International Journal of Advanced Manufacturing Technology*, 2009, Vol. 49 (9-12), pp. 1009-1018.

Conference Papers

1. A. F. M. Arif, **S. S. Akhtar**, A. K. Sheikh: "Critical Die Failure Types for Hot Aluminum Extrusion", Proceedings of 4th International Conference and Exhibition on Design and Production of Dies and Molds (Paper DM-62, pp. 73-76) held at Cesme, Turkey, 21-23 June, 2007
2. A.F.M. Arif, **S.S. Akhtar**, B.S. Yilbas and A.K. Sheikh: "Effect of Billet Quality on Aluminum Extrusion Die life: Statistical, Microstructural and Numerical Investigation (MAN102)", Proc. of International Conference on Applied Mechanics, Materials, and Manufacturing (ICAMMM-2010), December 13-15, 2010 at Sultan Qaboos University, Muscat, Oman.
3. B. S. Yilbas, **S. S. Akhtar**, E. Bayraktar, Z. Gasem: "Laser Cutting of Thin Aluminum and Silicon Alloy: Influence of Laser Power on Kerf Width" 14th International Conference on Advances in Materials and Processing Technologies (AMPT), 2011, Istanbul, Turkey, July 13-16, 2011.
4. **S. S. Akhtar**, A. F.M. Arif, Z. Gasem: "Stress field in the top coat of thermal barrier coating due to the formation of $\gamma\text{-Al}_2\text{O}_3$ – a numerical study" The 26th International Conference on Surface Modification Technologies (SMT26), held at Ecole Centrale de Lyon, France, June 20th – 22nd 2012.
5. **S. S. Akhtar**: "Development of thermo-mechanical simulation model for laser-induced surface modification of stainless steel", The 26th International Conference on Surface Modification Technologies (SMT26), held at Ecole Centrale de Lyon, France, June 20th – 22nd 2012.
6. **S. S. Akhtar**, A. F.M. Arif, Experimental and numerical investigation of extrusion die profiles for uniform and effective case-hardening treatment, ASME 2012 International Mechanical Engineering Congress & Exposition (IMECE2012) held at Houston, Texas, 9th Nov, to 15th No. 2012.

Technical Reports

1. Final report of the Project: Die Life Improvement for Hot Extrusion of Aluminum Alloys (KACST ARP-23-19), July 2008.
2. Final Report of the Project: Effect of Billet Quality on the Hot Extrusion Die Life (SB070023), December 2008.
3. Final Report of the Project: Effect of Surface Preparation and profile Geometry on the Case-Hardening of H13 Tool Steel (SB080002), Oct 2009.
4. Final Report of the Project: Laser gas Assisted Nitriding of Alumina Surfaces (SB100011),

5. Final Report of the Project: Investigation into Laser Treatment of Zirconia Surface (SB101012), January 2012.
6. Final Report of the Project: Development of Optimization Guidelines for Extrusion Die Profiles with Improved Service-Life (SB111002), March 2013.

Books

1. **S. S. Akhtar** and A. F. M. Arif "Hot extrusion dies: Failure Analysis, Nitriding & Effect of billet Quality" 2011, LAMBERT Academic Publishing (Germany), [ISBN 978-3-8465-4512-6](#)
2. B. S. Yilbas, **S. S. Akhtar** and S. Z. Shuja "Laser Forming and Welding Processes" 2013, Springer International Publishing, [ISBN 978-3-319-00981-3](#) (e-Book) and [ISBN 978-3-319-00980-3](#) (Hardcover).

Book Chapters

1. B. S. Yilbas, **S. S. Akhtar**, O. Keles, "Laser Straight Cutting of Ti-6Al-V: Temperature and Stress Fields", Chapter 8, 2012, page 241-263, book titled "Materials and Surface Engineering: Research & Development" Edited by J. Paulo Davim , Publisher: Woodhead Publishing Reviews: Mechanical Engineering Series No. 2, WOODHEAD/CHANDOS, Cambridge-Oxford (UK), [ISBN 0 85709 151 4](#)
2. B. S. Yilbas, **S. S. Akhtar**, O. Keles, "Laser Cutting of a Small Diameter Hole: Thermal Stress Analysis", book title: Laser in Manufacturing Edited by J. Paulo Davim, Publisher: John Wiley & Sons, Inc., Pages 179-202, 2012.
3. B. S. Yilbas, **S. S. Akhtar**, O. Keles , "CO₂ Laser Cutting of Triangular Geometry in Aluminum Foam" book title: Nontraditional Machining Processes Edited by J. Paulo Davim , Springer London, Pages 97-110, 2013.
4. **S. S. Akhtar** and B. S. Yilbas, "Laser Treatment of Steel Surfaces: Numerical and Experimental Investigations of Temperature and Stress" accepted for publication in "Comprehensive Materials Processing" edited by Professor Saleem Hashmi, in production and to be published by Elsevier in mid-2014.

Patents and Patent Applications

Patents Published/accepted

1. "Method for nitriding of Nickel-Chromium-based Superalloys", US Patent # 8377234.
2. "Method of Laser Treating Ti-6Al-4V to Form Surface Compounds", (Docket No # 31500.94) – Accepted by USA patent office, 2013.

Patents Filed

1. "Method of Laser Surface Treating pre-prepared Zirconia Surfaces", June 2011, (Docket # 32185.71) – Applied to USA patent office.

2. "Laser Nitriding Method of Making Phosphor Bronze with Surface-Embedded Titanium Particles" May 2012, (Docket # 34000.19) – Applied to USA patent office.
3. "Laser re-melting of HVOF coating with WC blend: Thermal stress analysis" December 2012, (Docket # 35000.40) – Applied to USA patent office.

Professional Activities

International Conference Attendance

- The 26th International Conference on Surface Modification Technologies (SMT26), held at Ecole Centrale de Lyon, France, June 20th – 22nd 2012.
- The 15th European Conference on Composite Materials (ECCM15) to be held in Venice, Italy, June 24th-28th, 2012.
- The 4th International Conference and Exhibition on Design and Production of Dies and Molds held at Cesme, Turkey, 21-23 June, 2007

Presentations

- Development of thermo-mechanical simulation model for laser-induced surface modification of stainless steel, The 26th International Conference on Surface Modification Technologies (SMT26), held at Ecole Centrale de Lyon, France, June 20th – 22nd 2012.
- Aluminum extrusion related research activities: Scope and importance from Kingdom's perspective Presented on Second Graduate's Seminar Day held at King Fahd University of Petroleum & Minerals (KFUPM), Dhahran, Saudi Arabia, 5 May 2008.
- Enhancement of Aluminum Extrusion Die for improved service life presented at Mechanical Engineering Departmental Seminar, KFUPM, Dhahran, Saudi Arabia, November 2007
- Critical Die Failure Types for Hot Aluminum Extrusion, Proceedings of 4th International Conference and Exhibition on Design and Production of Dies and Molds (Paper DM-62, pp. 73-76) held at Cesme, Turkey, 21-23 June, 2007.

Engineering Educational Workshop and Meetings

- Participated in Crash Course on "Hands-On Experience in Project-Centric Engineering Design Education" held at KFUPM Saudi Arabia, May-2011
- 9th Workshop and discussion Forum on "Clean Water and Clean Energy" held at KFUPM Saudi Arabia, June 2012.
- Participated in Work shop, presentations and discussion forum of "SABIC Materials Day" held at KFUPM Saudi Arabia, 7th April 2013.
- 9th Workshop and discussion Forum on "Clean Water and Clean Energy" held at KFUPM Saudi Arabia, January 2013.

Reviewer for the following International Scientific Journals

1. Journal of Laser Applications
2. Materials and Manufacturing Processes
3. The Arabian Journal for Science and Engineering
4. Journal of Mechanical Science and Technology
5. Materials Research
6. Machining Science and Technology
7. ASME Journal of Manufacturing Science and Engineering
8. Proceedings of the IMechE, Part B, Journal of Engineering Manufacture

Participation in Committees and Groups at KFUPM

- Member of Materials and Manufacturing group at ME department
- Served as member Continuing Education Committee in academic Year 2010/2011
- Served as member Teaching Assignment Committee in academic Year 2011/2012
- Served as member ABET/Self-Assessment Committee in academic Year 2012/2013
- Served as member of M.Sc. Theses defense committees
- Served as chairman and member of several Senior Project and Coop presentation evaluation committees
- Served as member of BS research thesis (ME495) defense committees

Membership

- Member of Pakistan Engineering Council (PEC), Pakistan
- Member of International Association of Engineers (IAENG)
- Member of the IAENG Society of Mechanical Engineering