

Darko Babic **Manager**

Professional Profile

Mr. Babic is a Manager in Exponent's Mechanical Engineering practice. Mr. Babic specializes in mechanical design, accident reconstruction, and failure analysis. He performs corrosion, fatigue, and fracture mechanics analyses of mechanical and electro-mechanical systems and components, as well as full-scale and laboratory testing, instrumentation, and data acquisition. Mr. Babic is experienced in metallurgical and polymer failure analyses using macroscopic and microscopic techniques for fracture surface and microstructure characterization. He makes extensive use of finite element modeling to evaluate structural, thermal, and fluid behavior.

He has extensive experience investigating and solving complex multidisciplinary problems in: heavy machinery and equipment (e.g., aerial lifts, forklifts, cranes, balers, pipe and rebar benders), industrial systems (e.g., refineries, boilers, pressure vessels, pipe and plumbing components, valves, gas and steam turbine components, steel and wooden structures), and consumer products (e.g., cribs, baby carriers, chairs and tables, smart phones, adapters, chargers, routers, heaters, reverse osmosis systems). These are typically related to root cause investigations or product recall. Within those investigations he has performed analysis of mechanical, hydraulic, electrical, and control systems.

Mr. Babic has performed research in the behavior of materials including: surface morphology changes as a result of electrical arcing, characterization of wheel attachments to vehicles (lug nuts, wheels and hubs), powder metallurgy alloys, sintered material analysis, material and fracture surface characterization, material imperfection analysis, fatigue of materials, and stress corrosion cracking and environmentally assisted cracking.

Prior to joining Exponent, Mr. Babic evaluated and developed enabling technologies in semiconductor manufacturing such as supercritical carbon dioxide cleaning methods and atomic layer deposition. He is experienced in clean room protocols and safety procedures. Mr. Babic is also experienced in vehicle design, testing, and analysis. He has participated in a racecar series and has direct experience with race preparation, vehicle systems, dynamics, and mechanics. He is currently completing his Ph.D. in Mechanical Engineering, at Arizona State University, with an emphasis on fatigue crack nucleation and propagation.

Academic Credentials and Professional Honors

M.S., Materials Science and Engineering, Arizona State University, 2002

B.S., Mechanical Engineering, Arizona State University (*magna cum laude*), 2000

Arizona State Regents Scholarship, awarded to international students with the highest academic merit, 1998–2000; Dean's Honor List, 1996–2000; Tau Beta Pi National Honor Society

Languages

Croatian, Serbian, Bosnian, Montenegrin, Russian

Patents

US20060065189A1 & WO2006039314A1: Method and system for homogenization of supercritical fluid in a high pressure processing system.

US20060065288A1 & WO2006039317A1: Supercritical fluid processing system having a coating on internal members and a method of using.

US20060065636A1: Method and system for controlling a velocity field of a supercritical fluid in a processing system.

US20060070640A1 & WO2006039321A1: Method and system for injecting chemistry into a supercritical fluid.

US20060130966A1: Method and system for flowing a supercritical fluid in a high pressure processing system.

US20060134332A1: Precompressed coating of internal members in a supercritical fluid processing system.

US20060266289A1 & WO2006078666A2: Reaction system for growing a thin film.

Publications

Babic D, Chawla N, Williams JJ, Polasik SJ, Marucci M, Narasimhan KS. Effect of copper and nickel alloying additions on the tensile and fatigue behavior of sintered steels. *Advances in Powder Metallurgy and Particulate Materials* 2002; 5:104–112.

Soetanto D, Babic D, Kuo CY. Stabilization of human standing posture using functional neuromuscular stimulation. *Journal of Biomechanics* 2001; 34:1589–1597.

Wu L, Xu Y, Wang F-Y, Lin YT, Li PZ, Liu WJ, Mirchandani PB, Babic D, Kuo CY. Supervised learning of longitudinal driving behavior for intelligent vehicles using neuro-fuzzy networks: Initial experimental results. *International Journal of Intelligent Control and Systems* 1999; 3:443–463.

Selected Presentations

Babic D. Finite element analysis as a part of failure analysis, constitutive modeling, non-linear behavior. Failure Analysis Class Lectures at Arizona State University, 2011.

Babic D, Arora A. Expected environmental conditions in automotive applications – Temperature distribution in a polymeric dash board. Presentation, 2009 IEEE Symposium on Product Compliance Engineering, IEEE Product Safety Engineering Society (PSES), Toronto, Canada, 2009.

Babic D, Chawla N, Williams JJ, Polasik SJ, Marucci M, Narasimhan KS. Effect of copper and nickel alloying additions on the tensile and fatigue behavior of sintered steels. World Congress for Powder Metallurgy and Particulate Materials, Orlando, FL, 2002.

Professional Affiliations

- American Academy of Forensics Sciences – Member
- ASM International (Former Arizona Chapter Chair)
- American Society of Mechanical Engineers
 - Committee for High Pressure Piping Code B31.3, Task Group H – High Pressure Ultra High Purity Systems – Former Member
- Semiconductor Equipment and Materials International (SEMI), Former Contributing Member to the High Pressure Task Force
- Society of Automotive Engineers
- ASME – FIRST Robotics Competition Mentoring Program