

MICHAEL R. MAUGHAN, Ph.D., P.E.

Mechanical Engineering & Materials Science | Expert Witness Consulting

mmaughan@precisiontechnicaladvisors.com | precisiontechnicaladvisors.com | Pullman, WA

Areas of Expertise

Manufacturing Process Defects • Component Design/Design for Manufacturability • Product Liability — Failure Analysis • Welding • Additive Manufacturing Processes & Defects • Metal Casting & Formed Metal Parts • Injection Molded & Plastic Components • Materials Characterization and Mechanical Testing

Education

Ph.D., Materials Engineering — Purdue University, West Lafayette, IN	2015
M.S., Mechanical Engineering — University of Idaho, Moscow, ID	2007
B.S., Mechanical Engineering — University of Idaho, Moscow, ID	2005

Licenses & Certifications

Professional Engineer (P.E.) — Idaho, License #17361	2017–present
Professional Engineer (P.E.) — Washington, License #26012773	2026–present

Professional Experience

Associate Professor , Department of Mechanical Engineering, University of Idaho, Moscow, ID Research in advanced manufacturing processes, manufacturing defects, materials process-structure-properties relationships, and failure analysis.	2023–present
Assistant Professor , Department of Mechanical Engineering, University of Idaho, Moscow, ID	2017–2023
Clinical Assistant Professor , Department of Mechanical Engineering, University of Idaho, Moscow, ID	2015–2017
Lead Mechanical Design Engineer , IVUS Industries Inc., Moscow, ID Product design and design for manufacturability across multiple manufacturing processes including injection molded plastic components, die cast parts, bent sheet metal fabrications, circuit board assemblies, and electrical enclosures. Led product development from concept through production.	2007–2013
Mechanical Design Engineer , Hewlett-Packard Company, Vancouver, WA Design engineering in a Fortune 50 environment; product development and testing.	2007

Expert Witness & Consulting Experience

Principal Consultant, Precision Technical Advisors LLC, Pullman, WA — 2026–present

Independent expert witness consulting in mechanical engineering and materials science for attorneys and law firms in technically complex litigation matters. Services include case review and analysis, written expert reports, and deposition and trial testimony.

Prior Testimony: None

Selected Publications — Manufacturing Processes, Additive Manufacturing, and Welding

35 peer-reviewed journal publications; selected below for relevance to litigation support work. Full publication list available upon request.

- M.R. Maughan, R.R. Stephens, D.M. Blacketter, K.K. Rink. “Thermal Stresses in Bridge-Wire Initiators Due to Laser Welding” Journal of Electronic Packaging, (2009).

- N. Brubaker, H. Ali, S. Dhakal, N. van Rooyen, M. Jaster, I. Charit, B. Jaques, M.R. Maughan, “Investigating Microstructure and Properties of 316L Stainless Steel Produced by Wire-Fed Laser Metal Deposition” *Journal of Materials Engineering and Performance*, (2022).
- Y. Singla, T. Tosaya, M.R. Maughan, “On the Influence of vapor bath smoothing on the fatigue life of 3D printed ABS” *Journal of Materials Engineering and Performance*, (2023).
- Y.K. Singla, J.D. Miller, K. Raja, M.R. Maughan, “Toward single crystal nickel fabrication using WAAM – A first report”, *Journal of Materials Research and Technology*, (2023).
- L. Nunez, C.M. Downey, I.J. van Rooyen, I. Charit, M.R. Maughan “Analysis of Surface Roughness in metal directed energy deposition” *International Journal of Advanced Manufacturing Technology* (2024).
- N. Gould, M. Bhattacharyya, I. Charit, M.R. Maughan, “Indentation Investigation of 304L Stainless Steel Friction Stir Weld Simulated Crack Repair” *Materials Science and Engineering A*, (2022).
- E. Getto, M. Johnson, M.R. Maughan, N. Nathan, J. McMahan, B. Baker, K. Knipling, S. Briggs, K. Hattar, M.J. Swenson, “Friction Stir Welding and Self-Ion Irradiation Effects on Microstructure and Mechanical Properties Changes with on Oxide Dispersion Strengthened Steel MA956” *Journal of Nuclear Materials*, (2022).
- Y. Singla, M.R. Maughan, N. Arora, D.K. Dwivedi, “Enhancing the wear resistance of iron-based alloys: A comprehensive review of alloying element effects” *Journal of Manufacturing Processes*, (2024).
- M.R. Maughan, M.T. Carvajal, D.F. Bahr, “Nanomechanical Testing Technique for Millimeter-sized and Smaller Molecular Crystals,” *International Journal of Pharmaceutics* (2015).
- M.R. Maughan, H.M. Zbib, D.F. Bahr, “Variation in the Nanoindentation Hardness of Platinum,” *Journal of Materials Research* (2013).

Edited Books

- A. Kumar, K. Singla, M.R. Maughan (Eds.), *Fracture Behavior of Nanocomposites and Reinforced Laminate Structures*, Springer (2024).
- A. Kumar, K. Singla, M.R. Maughan (Eds.), *Digital Manufacturing in Industry 5.0*, Springer (2026).

Patents

- Wide Voltage, High Efficiency LED Driver Circuit, U.S. Patent No. 8,203,281 B2
- Orientationless Spring Probe Receptacle Assembly, U.S. Patent No. 7,841,865 B2
- Universal Power Interface Bus, U.S. Patent No. 8,604,754 B2
- Equalization Method and Circuit for Ultracapacitors, U.S. Patent No. 8,269,469 B2
- Printed Circuit Board Direct Connection and Method of Forming the Same, U.S. Patent No. 7,766,665 B2

Research Funding

Total research funding: \$10,119,750 (as PI: \$5,002,213). Funding sources include NSF, DoD, Idaho National Laboratory, NASA, and industry partners. Representative active grants:

- Development of 3D printing processes for bio-based wood composite construction materials: RII Track-2 – National Science Foundation (\$3,974,309, PI, 2021–2026)
- Effects of Laser Ablation on Fatigue Strength and Material Behavior of Ship Building Steel – Naval Surface Warfare Center Dahlgren Division/NUWC Keyport (\$146,412 awarded to-date – renewable up to \$446,876, PI, 2025–2028)
- Design and development of a multi-sensor AI-based instrument for animal biometric measurement – National Science Foundation (\$1,040,107, Co-PI, 2025-2028)

Professional Memberships

- American Society of Mechanical Engineers (ASME)
- The Minerals, Metals and Materials Society (TMS)

Selected Honors & Awards

Outstanding Mid-Career Faculty Award, University of Idaho College of Engineering	2025
Outstanding Early Career Faculty Award, University of Idaho College of Engineering	2022
Estus H. and Vashti L. Magoon Award for Excellence in Graduate Teaching, Purdue University	2015

Compensation: \$300/hr case review and analysis; \$350/hr deposition and trial testimony; \$150/hr travel. Retainer required. Compensation is not contingent on case outcome.