Mingxi Zheng, M.S., P.E.
Materials/Mechanical Engineer
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SUMMARY

Mingxi is a Licensed Professional Mechanical Engineer in the state of California with expertise in materials development and mechanical engineering across a broad range of industries. With a specialty in metallurgy, fracture mechanics, and failure analysis, she has experience in materials testing, characterization, and process development in aerospace and manufacturing. Prior to joining Berkeley Engineering And Research, Inc., she held engineering roles at SpaceX, Virgin Orbit, and other early-stage startups, where she worked on integrating Mil, ASTM, ISO, and NASA specifications into the product development process during transitions from R&D to production. She has also created novel and customized processes for these industries. In addition to knowledge of traditional materials and processing methods, she has developed novel processing and characterization methods for additively manufactured metallic and polymeric materials. She takes a big picture approach, centering on the intersection of materials science and mechanical design, in addition to catching critical details. Her extensive industry experience allows her to provide unique and strategic insight into identifying key evidence, documents and information crucial to case resolution.

Major projects include: reusability and fatigue analysis on structural components of the Falcon 9 launch vehicle at SpaceX, manufacturing process development of novel textile materials, process optimization for metallic additive manufacturing at Virgin Orbit; development of Technical Data Sheets at Carbon, Inc.; design/failure analysis of heavy machinery; metallography; blender explosions; heating pad burns; battery technology; candle explosions; and various consumer products.

EDUCATION

M.S. Materials Science and Engineering, University of California, Berkeley
B.S. Materials Science and Engineering, University of California, Berkeley

SELECTED INDUSTRY EXPERINCES AND EXPERTISE

- Additive manufacturing
- Aerospace/Space launch
- Computer Aided Design
- Consumer products
- Corrosion
- Fatigue
- Fracture mechanics
- Failure analysis
- Failure modes and effects analysis
- GD&T
- Manufacturing processes
- Metallurgy & metallography
- Microscopy
- New material development
- Polymeric materials
- R&D to Production Transitions

LICENSES & CERTIFICATIONS

Licensed Professional Engineer, Mechanical, California M40879

PROFESSIONAL EXPERIENCE

2016 – Present

Engineer, Expert Witness, Berkeley Engineering and Research, Inc.

Lead inspections of evidence and documents for a variety of mechanical and material related cases, including the following industries: oil and gas, industrial equipment, chemical, and consumer products. Provide opinions on design, manufacturing, and warnings defects. Author technical expert reports and white papers. Provide expert testimony in deposition and trial.

Case highlights: Blender explosions and lacerations; heating pad injuries; button battery safety; baby and infant product safety and design, including the Rock n' Play; corrosion failures; Bodum/French press glass explosions; exploding glass bottles; general coffee makers; bicycle design and failures; fire pit design and safety; fittings and pipe failures; weldment failures; dezincification; warnings and human factors design; autonomous driving; insurance claims; metallurgy; intellectual property; installation quality; failure of city infrastructure.

2018 – 2019

Materials Engineer, Carbon Inc., Redwood City, CA

Responsible for defining the characterization of Carbon's custom 3D printing resins and custom additive CLIP process for applications in various industries, including aerospace, automotive, dental, industrial, medical, and sporting goods. Developed the original internal material testing standard procedures to evaluate Carbon's hardware, software, and materials for environmental stability, aging, and mechanical behavior under various conditions. Implemented failure analysis processes and material quality systems. Designed warnings and safety guidelines for the materials development and test lab. Authored original mechanical design patent. Developed a novel methodology for printing multiple materials in one build. Developed custom test samples to evaluate material interface strength.

Provided design and engineering consultation to customers from a variety of industries: medical, consumer product, and automotive. Authored and designed the Technical Data Sheets (TDS) for most of Carbon's material offerings, available online and used by customers and Sales teams to understand material performance and applications. Interfaced with interdisciplinary teams between

2017 – 2018

Advanced Materials Development Engineer/Quality Engineer, Virgin Galactic, Long Beach, CA

Acted as company's subject matter expert in metallurgy and metallography. Owned the development of a materials development roadmap to characterize materials for additive manufacturing on the DMG Mori Lasertec 4300 3D and its application in rocket launch. Designed materials sample CAD models to meet ASTM characterization requirements. Authored study results to present at national additive materials conference. Mentored summer interns.

Designed, built, and oversaw company's first materials test lab, ensuring the lab met safety and equipment standards. Created safety signage and warnings for equipment. Handled Capex purchases for high value lab equipment. Reviewed drawings and performed vehicle quality inspections. Led weekly quality reviews, authored work orders, and oversaw technician work.

2015 – 2016
Materials and Process Engineer, SpaceX, Hawthorne, CA
Supported return to flight efforts as a primary failure analysis specialist for structures following the 2015 anomaly. Led material testing to evaluate fatigue performance of alloys used in spaceflight. Developed a fracture and fatigue FEA tool for aluminum and steel alloys, and coatings for use in reliability modeling and analysis. This supported the successful launch of the first reused Falcon 9 booster. Evaluated different adhesives for use in the spacesuit. Audited vendors and performed supplier validations. Performed quality control testing of samples from various vendors. Mapped locations on the Falcon 9 for inflight evaluation. General failure analysis of in-flight and ready for flight parts.

Standardized and executed novel test plans to define effects of coatings on fatigue. Authored various Standard Operating Procedures (SOPs). Oversaw the paint process for the first Demo Crew Dragon vehicle. Drove corrective actions to completion with improved documentation and new process implementation procedures. Developed new materials allowables through hands-on testing and through third-party test houses. Determined approved adhesives for structures production to comply with chemical compatibility requirements and in-space performance requirements.

2016
Materials Science and Engineering Instructor, University of California, Berkeley
Instructor for the Department's Characterization lab course: MSE 104, "Materials Characterization". Conducted lectures on characterization methods and led lab sections on SEM/EDS, X-Ray diffraction, and TEM. Responsibilities also included grading homework, exams, and lab reports, and holding office hours.

2014
Fiber R&D Engineer (Co-op), Bolt Threads, Emeryville, CA
Prototyping using the company's sustainable silk polymer alternative. Developed and executed custom testing methods for characterization. Designed experiments to determine the relationship between process changes to final material properties.

2011-2012
R&D Intern, Nitto Denko Technical Co., Oceanside, CA
Analytical testing and evaluation of OLED devices for medical applications. Optimized processes to fabricate OLED devices.

RESEARCH
2016
"Fatigue and Fracture and high strength Ni-based bulk metallic glass", Master's thesis advised by Professor Robert Ritchie

- S/N Fatigue testing and fracture toughness testing of bulk metallic glasses.
- SEM analysis of fracture surfaces to determine failure mechanisms of different alloy formulations.

2012-2014
Undergraduate Research Assistant, UC Berkeley, Professors Luke Lee and Robert Ritchie

- Researched methods to improve photolithography process for use in lab-on-a-chip medical devices under the supervision of the lab of Prof. Luke Lee.
- Researched processing methods to create composite ceramic/metallic materials to mimic the properties of nacre under the supervision of the lab of Prof. Robert Ritchie.

PATENTS

"BONDED ASSEMBLIES HAVING LOCKING ORIFICES AND RELATED METHODS", Mingxi Zheng. US 20200276770 A1, February 26, 2020.

TALKS & SEMINARS

Zheng, Mingxi. "How Materials Science Finds Answers in Failures." Nerd Nite San Francisco, 20 February, 2019.

Zheng, Mingxi. "How Materials Science Finds Answers in Failures." Nerd Nite East Bay, 28 May, 2018.

Zheng, Mingxi. "Fatigue and Fracture and high strength Ni-based bulk metallic glass." University of California, Berkeley Grad Slam, 28 March, 2016.

AWARDS & HONORS

2nd Place, UC Berkeley Grad Slam Research Presentation, 2016

2015 Elaine Shen Memorial Prize, UC Berkeley Materials Science and Engineering Department.

2014 Elaine Shen Memorial Prize, UC Berkeley Materials Science and Engineering Department.

2014 ASM-SAMPE Materials Technology Scholarship, Santa Clara Chapter.

2014 The Leadership Award, Cal Alumni Association.

PROFESSIONAL AFFILIATIONS

American Society of Mechanical Engineers

ASTM International, E28 Committee (Mechanical Testing)

Cal Alumni Association

SELECTED COUREWORK

MSE102: Bonding, Crystallography, and Crystal Defects

MSE103: Phase Transformations and Kinetics

MSE111: Properties of Electronic Materials

MSE113: Mechanical Behavior of Engineering Materials

MSE151: Polymeric Materials

MSE112: Corrosion

ME122: Processing of Materials in Manufacturing

E115: Engineering Thermodynamics

E117: Methods of Engineering Analysis

CHEME179: Solid State Devices

EE134: Photovoltaic Devices

IEOR171: Technology Firm Leadership

IEOR170: Industrial Design and Human Factors

CE249: Experimental Methods in Structural Engineering

MSE201A: Thermodynamics and Phase Transformations

MSE204: Theory of Electronic Microscopy and X-Ray Diffraction

EE290B: Solid State Devices

MSEC212: Deformations, Fracture and Fatigue of Structural Materials

MSEC286: Modeling and Simulation of Advanced Manufacturing Processes

OTHER EXPERIENCE

2025-current

Leatherworking Apprentice, North & East Leather, Berkeley, CA