

ALEX ZELHOER, PH.D., P.E.

Senior Associate



Summary

Dr. Alex Zelhofer specializes in the development, evaluation, and failure analysis of industrial equipment and consumer products. He has consulted on industrial problem solving, product recalls, defect litigation, workplace safety, OSHA and Cal/OSHA compliance, intellectual property disputes, and insurance matters. In addition to conducting technical evaluations, he frequently assembles and directs multidisciplinary teams, applying advanced non-destructive and destructive testing methods—such as 3D scanning, CT imaging, and high-load mechanical testing—to resolve complex engineering challenges across industries from hydraulics and automated machinery to vehicles, exercise equipment, and consumer electronics.

Areas of Technical Expertise

- Industrial Machinery
- Industrial Equipment
- Industrial Vehicles and Heavy Machinery

Education

- Ph.D., Mechanical Engineering, California Institute of Technology (Caltech), 2017
- M.S., Mechanical Engineering, California Institute of Technology (Caltech), 2014
- B.S., Mechanical Engineering, Milwaukee School of Engineering, 2012

Registrations

- Licensed Professional Mechanical Engineer in AZ, CA, MO, NV
- 40-Hour Hazardous Waste Operation and Emergency Response Certification
- IFPS Certified Fluid Power Electronic Controls Specialist, Certificate
- OSHA #7115 Lockout/Tagout

Professional Activities

- Member, Association of Advancing Automation (A3)
- Member, A3 Robotics - R15.06 Industrial Robot Safety Committee
- Member, A3 Robotics - R15.08 Industrial Mobile Robot Safety Committee
- Member, National Fluid Power Association (NFPA)
- Member, ISO/TC 131/SC 9/WG 1 – Hydraulic Systems, U.S. Technical Advisory Group

Select Project Experience

Industrial Machinery

Confidential Client, Confidential Location. * Safety review of conveyor systems and comparison to relevant voluntary standards and OSHA.

Confidential Client, Confidential Location. * Forensic investigation of unintended movement of automated industrial machinery.

Confidential Client, Confidential Location. * Root cause investigation of meat grinder incident.

Confidential Client, Confidential Location. * Safety review of custom designed and built machinery and comparison to relevant voluntary standards.

Industrial Equipment

Confidential Client, Confidential Location. * Root cause investigation of an exploding underwater electrical enclosure.

Confidential Client, Confidential Location. * Risk estimation of potential steam release from a pressure safety valve (PSV).

Industrial Vehicles

Confidential Client, Confidential Location. * Forensic investigation of the unintended movement of a grapple on a skid steer.

Confidential Client, Confidential Location. * Root cause investigation of an alleged tarping system incident on a refuse vehicle.

Confidential Client, Confidential Location. * Root cause investigation of the unintended movement of a grinder component of a roadway paint line grinding vehicle.

Confidential Client, Confidential Location. * Root cause investigation of the unintended movement of the portion of a reach truck.

*Denotes work performed with previous employer.

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Confidential Client, Confidential Location. * Verification testing of the pressure capacity of a marine fuel line.

Sworn Testimony**Depositions**

Marsh v MORryde Int'l, Inc., September 13, 2023.

Allied Services, LLC v. Smash MyTrash, LLC, August 26, 2022.

Trials

Allied Services, LLC v. Smash MyTrash, LLC, February 27, 2024.

Select Papers, Lectures and Publications

"Computational Modeling of the Mechanics of Elastic Structural Lattices: Effects of Lattice Architecture and Hierarchy," California Institute of Technology, 2017 (author)

"On Acoustic Wave Beaming In Two-Dimensional Structural Lattices." International Journal of Solids and Structures. 2017 (co-author)

"Automated Additive Construction (AAC) For Earth And Space Using In Situ Resources." In 15th Biennial ASCE Conference on Engineering, Science, Construction, and Operations in Challenging Environments, Reston, VA: American Society of Civil Engineers, 2016 (co-author)

"Auxeticity In Truss Networks and The Role Of Bending Versus Stretching Deformation." Smart Materials and Structures 25. 2016 (co-author)

"Resilient 3D Hierarchical Architected Metamaterials." Proceedings of the National Academy of Sciences. 2015 (co-author)

CONTACT

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