Exponent®
Engineering & Scientific Consulting

David Christianson

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Professional Profile

Dr. Christianson specializes in failure analysis, characterization, and mechanical behavior of materials with an emphasis on metallic materials.

Dr. Christianson's expertise is in the characterization of the process-structure-property relationship within magnesium-based alloys through prototyping and model development. This includes techniques such as alloy fabrication, mechanical testing, optical microscopy, scanning electron microscopy (SEM), electron probe microanalysis (EPMA), Auger electron spectroscopy (AES), x-ray diffraction (XRD), and differential scanning calorimetry (DSC).

Prior to Exponent, Dr. Christianson worked with QuesTek Innovations as a materials design engineer where he worked on the development of property models and utilization of thermodynamic and kinetic models within the ThermoCalc software to understand the process-structure-property relationship for variable alloys systems. These models were implemented for the design of additively manufactured nickel-based superalloys. His work also involved the design of extreme environment metal matrix composites for friction stir welding.

Dr. Christianson obtained his Ph.D. in Materials Science & Engineering from the University of Florida. His work centered around the development of novel Mg-Li based alloys for use in automotive and aerospace applications. Dr. Christianson’s thesis involved the fabrication, mechanical testing, kinetic model development, and characterization of these Mg-Li alloys. The characterization work of these materials involved optical microscopy, SEM, EPMA, XRD, and mechanical testing to understand the effects of alloying elements and thermomechanical processing on the structure property relationship of these systems.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, University of Florida, 2022

B.S., Materials Science and Engineering, University of Illinois at Urbana-Champaign, 2015

Licenses and Certifications

Professional Engineer Metallurgical, California, #2056

NACE Certified Coating Inspector

Publications

Christianson, David W. Zhu, Lilong. Manuel, Michele V. Experimental measurement of diffusion coefficients and assessment of diffusion mobilities in HCP Mg-Li-Al alloys. Calphad 2020; 71.

Wang, Wenqing. Zeng, Qingxuan. Li, Mingyu. Zheng, Weihua. Christianson, David. Economy, James. Absorptive Removal of Carbon Dioxide Using Polyethyleneimine Loaded Glass Fiber in a Fixed Bed. Colloids and Surfaces A: Physiochemical and Engineering Aspects 2015; 481:117-124.