Exponent®
Engineering & Scientific Consulting

David Christianson

Senior Engineer | Metallurgical and Corrosion Engineering
Menlo Park
+1-650-688-7065 | dchristianson@exponent.com

Professional Profile

Dr. Christianson's areas of expertise include failure analysis, mechanical testing, material characterization, and mechanical behavior of materials. His specific expertise includes metallurgy, fracture/fractography, fatigue testing, and coating inspection.

Dr. Christianson has leveraged this expertise on projects including failure analysis of medical devices, refinery equipment, sustainable energy equipment, water treatment equipment, and consumer electronics. This analysis utilizes his knowledge of fatigue, corrosion, non-destructive examination, material design/selection, and material characterization. In addition to failure analysis, his experience includes designing and performing fatigue testing of medical devices and other custom mechanical testing setups. As a NACE Level 2 Certified Coatings Inspector, he also investigates coating related failures in industrial applications.

Prior to Exponent, Dr. Christianson was a Graduate Research Assistant at the University of Florida, where he received his doctoral degree in 2022 specializing in the characterization and 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, scanning electron microscopy (SEM), electron probe microanalysis (EPMA), X-ray diffraction (XRD), Auger electron spectroscopy (AES), differential scanning calorimetry (DSC), and mechanical testing to understand the effects of alloying elements and thermomechanical processing on the structure property relationships 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

Patents

Manuel, Michele V. and Christianson, David Wesley, "Magnesium-Lithium Alloys Composed of Gallium or Indium", U.S. Patent filed December 7, 2023. Patent Pending. Application Number 18/567,951.

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Publications

Yang, Yang, Christianson, David, Manuel, Michele V. "Experimental study of diffusion coefficients and assessment of atomic mobilities in FCC Al-Cu-V alloys," Calphad, 83 (2023). DOI: 10.1016/j.calphad.2023.102629

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.