



Exponent[®]
Engineering & Scientific Consulting

Daniel Hsiao, Ph.D.

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Professional Profile

Dr. Hsiao specializes in mechanical testing, failure analysis, and manufacturing quality assurance. With a focus on understanding how materials behave in various industries, including manufacturing, consumer products, and biomedical devices, he has experience investigating complex material failure issues. Additionally, Dr. Hsiao is proficient in utilizing Finite Element Analysis (FEA) software for advanced structural analysis and simulation.

Dr. Hsiao's research efforts at the University of Pittsburgh focused on the design and fabrication of piezoelectric sensors for application in harsh environments. He has experience utilizing interdigital transducers (IDT) to generate surface acoustic waves and characterizing the relationship between the resonant frequency of the acoustic waves and temperature.

Before joining Exponent, Dr. Hsiao was an Operations Engineer at Fisher & Paykel Healthcare Ltd, a medical device manufacturing company based in Auckland, New Zealand. He is experienced in the production of healthcare products in an FDA-regulated environment, specifically focusing on heated humidification products for use in respiratory care and treatment of obstructive sleep apnea. Dr. Hsiao has experience analyzing product reliability and optimizing production efficiency. Through cross-disciplinary collaborations, Dr. Hsiao analyzed product defects and mapped process flow for continuous improvement of quality and efficiency.

Natural Fiber Reinforced Polymers and Composite Material Failure Analysis for Sustainable Solutions Dr. Hsiao possesses a strong materials science background in natural fiber reinforced polymers and material failure analysis in composite materials. He has worked on the development and characterization of natural fiber reinforced polymer composites, exploring the potential of these sustainable materials for various applications. Dr. Hsiao has experience investigating the mechanical properties and performance of natural fiber reinforced polymers in construction materials. In addition, he has conducted in-depth failure analysis of composite materials, examining factors such as delamination, fiber-matrix debonding, and matrix cracking.

Expertise in Experimental Mechanical Testing for Medical Device and Consumer Product Reliability Dr. Hsiao has experience conducting static and fatigue testing, as well as analyzing surface characteristics using optical microscopy, profilometry, and scanning electron microscopy (SEM) for medical devices and consumer products. He applies his expertise to evaluate the mechanical performance and long-term reliability of various devices and products, such as cables, hoses, heating chambers, breathing masks, and orthopedic implants. Additionally, Dr. Hsiao has experience in mechanical testing to characterize the performance of various materials, including polymers, metals, composites, and rubbers.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of Pittsburgh, 2022

M.E., Mechanical Engineering, University of Auckland, 2011

B.E., Mechanical Engineering, University of Auckland, 2009

Prior Experience

Operations Engineer, Fisher & Paykel Healthcare, 2008-2011

Student Intern - Operations Engineer Assistant, Fisher & Paykel Healthcare, 2007

Student Intern - Engineering Assistant, Far East Machinery Co. Ltd, 2005