Exponent®
Engineering & Scientific Consulting

Armando Shehi, Ph.D.

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Professional Profile

Dr. Shehi specializes in atmospheric and localized corrosion of metallic components and the prediction of their life expectancy in highly aggressive aqueous environments. He has experience conducting atmospheric and pitting corrosion tests, ASTM-standard linear polarization resistance (LPR), cyclic potentiodynamic polarization (CPP), and design of experimental techniques tailored to complex corrosion scenarios. Dr. Shehi is proficient in metallographic preparation and materials characterization using optical microscopy (OM), scanning electron microscopy (SEM), and energy dispersive X-ray spectroscopy (EDS). His skills also encompass modeling of corrosion processes and mechanisms through thermodynamic and finite element analysis (FEA) techniques. His research experience also includes evaluating the corrosion behavior of both traditionally and additively manufactured (AM) biomaterials such as Ti-based alloys, Co-Cr-Mo, and SS316, and investigating how build orientation impacts corrosion resistance of AM SS304 in marine environments.

Prior to joining Exponent, Dr. Shehi earned his Ph.D. in Materials Science and Engineering from the Center for Electrochemical Science and Engineering (CESE) at the University of Virginia. His doctoral work focused on integrating experimental and modeling techniques to study the effects of environmental variables-such as chemical composition, temperature, relative humidity, and water layer thickness-on pitting corrosion to predict the maximum pit size in engineering structural materials. During his time there, he developed novel methods that more accurately capture pit propagation kinetics in aggressive environments, including the influence of corrosion inhibitors. He has also been involved in pioneering projects that seek to implement cutting edge in-situ transmission electron microscope (TEM) electrochemical techniques.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, University of Virginia, 2025

M.S., Materials Science and Engineering, University of Virginia, 2024

B.S., Chemical Engineering, California State Poly University, Pomona, 2021

University of Virginia, School of Engineering and Applied Sciences Distinguished Fellowship, 2021

California State Polytechnic University-Pomona, School of Engineering Valedictorian, 2021

AMPP Academic Foundation Scholarship, 2020

AMPP Oliver Moghissi Memorial, 2020

ASM International Los Angeles Chapter Scholarship, 2020

Professional Affiliations

Association for Materials Protection and Performance (AMPP)

The Minerals, Metals & Materials Society (TMS)

The Electrochemical Society (ECS)

Publications

Shehi A, Kelly RG. The shape factor for pits and its impact on pit stability. Journal of The Electrochemical Society 2025; 172(5):051501. doi:10.1149/1945-7111/add6db.

Shehi A, et.al. Corrosion behavior of additively manufactured and wrought Ti-6Al-4V alloys in phosphate buffered saline solutions. CORROSION 2021; 51321-16930, April 2021.

Chan HL, Shehi A, Newkrik J, Ravi VA. The effect of build orientation on the corrosion behavior of SLM 304L alloys. CORROSION 2021; 51321-16904, April 2021.

Presentations

Shehi A, Kelly RG. Exploring geometrical contributions to the conversion from one-dimensional to three-dimensional critical pit stability product: an analytical and computational approach. Gordon Aqueous Corrosion Conference, New London, NH, July 2024.

Shehi A, Kelly RG. A closer look into the impact of pit shape and repassivation potential in predicting the maximum pit size for stainless steels under atmospheric conditions. AMPP 2024, New Orleans, LA, March 2024.

Shehi A, Choudhary S, Kelly RG. On the importance of shape factor in predicting maximum pit size. ECS meeting, Gothenburg, SE October 2023.

Shehi A, Choudhary S, Kelly RG. Revisiting the repassivation potential A 1-D Pit approach. AMPP 2023. Denver, CO, March 2023.

Shehi A, Choudhary S, Kelly RG. The effects of sulfate and nitrate on the parameters for maximum pit size calculations on stainless steel 316L. ECS 242nd meeting, Atlanta, GA October 2022.

Shehi A. The effect of sulfate-to-chloride ion ratio on the kinetic parameters for pit stability. Gordon Aqueous Corrosion Conference, New London, NH, July 2022.

Shehi A, Chan HL. The effect of build orientation on the corrosion behavior of SLM 304L alloys. AMPP 2021, Virtual Presentation, April 2021.

Shehi A, et.al. Corrosion study of additively manufactured biomedical alloys in phosphate-buffered saline. ASM International, Los Angeles Chapter Poster Competition, Online, May 2020.

Shehi A, et.al. Corrosion study of additively manufactured biomedical alloys in phosphate-buffered saline. ASM International, Los Angeles Chapter Poster Competition, Online, May 2020.

Peer Reviews

Journal of the Electrochemical Society

CORROSION Journal