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Engineering & Scientific Consulting

Arthur Racot, Ph.D.

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Professional Profile

Dr. Racot is a materials engineer with extensive expertise in metallurgy, corrosion, material characterization, fractography, and root cause analysis. His corrosion analysis skillset includes using potentiodynamic, Electrochemical Impedance Spectroscopy (EIS), and polarization pulse testing to better understand material corrosion performance. He also uses characterization techniques such as Scanning Electron Microscopy (SEM), Energy Dispersive X-ray Spectroscopy (EDS), and Electron Backscatter Diffraction (EBSD) to understand the link between microstructural, corrosion and mechanical behavior. Dr. Racot has developed significant experience in additive manufacturing and deep-sea ROV applications for the oil and gas industry. He specializes in the correlation between microstructure and corrosion properties, failure analysis, and has experience with stainless steel, aluminum and anodized aluminum, titanium, and Inconel.

Prior to joining Exponent, Dr. Racot served as a Quality and Reliability Engineer at Schilling Robotics, TechnipFMC, specializing in deep-sea ROVs and manipulators in Davis, California. In this role, he supported production and new product development as a material engineer and facilitated product improvement and customer support through root cause analysis of deep-sea ROV issues in the oil and gas industry. His key responsibilities included managing projects, addressing complex metallurgy issues, and leading vendor qualifications for specialized processes such as metal additive manufacturing and coating. Dr. Racot's expertise in metallurgy and material science was crucial in identifying and resolving a stress corrosion failure issue with metal injection molding parts, where he collaborated with the vendor to deliver a solution that benefited both the company and the customer. Before joining Schilling Robotics, TechnipFMC, Dr. Racot completed his PhD research at the University of Bordeaux in the Department of Materials Science, Mechanics, and Engineering in partnership with the French Alternative Energies and Atomic Energy Commission (CEA). His doctoral studies focused on the correlation between the microstructure of 316L stainless steel

produced by Selective Laser Melting and Wire Arc Additive Manufacturing and its corrosion properties. During his research, he developed a method using potentiodynamic pulse testing to study pitting initiation sites in the microstructure of this material obtained with these additive technologies. During this time, he became an expert in corrosion techniques such as polarization curve testing, Electrochemical Impedance Spectroscopy (EIS), and polarization pulse testing, as well as characterization techniques including Scanning Electron Microscopy (SEM), Energy Dispersive X-ray Spectroscopy (EDS), Electron Backscatter Diffraction (EBSD), and Transmission Electron Microscopy (TEM). Additionally, Dr. Racot was a member of CEFRACOR (French Anti-Corrosion Center).

Academic Credentials & Professional Honors

Ph.D., Mechanical, University of Bordeaux, 2022

Publications

Racot, A., Aubert, I., Touzet, M., Thiebaut, S., & Demesy, M. (2022). Statistical analysis of the pitting corrosion induced by potentiostatic pulse tests of wrought and SLM 316L stainless steels. Corrosion Science, 197, 110036.

Presentations

Arthur R, Isabelle A, Marie T, Michel D, Stéphanie T. Sensitivity to pitting corrosion of stainless steels produced by additive manufacturing. Annual event of the European federation of corrosion, EUROCORR 2021, Budapest, Hungary, 2021

Arthur R, Isabelle A, Marie T. Sensitivity to pitting corrosion of stainless steels produced by additive manufacturing. Annual event of the European federation of corrosion, EUROCORR 2020, Brussel, Belgium