Sean Owen Clancy, Ph.D.

Leader, Scientist, Technology Developer, Problem Solver

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Curriculum Vitae
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- **Engineering, Laboratory, Personnel, Project, and Program Management:** Experienced leader, people manager, and scientist with a strong background in data and instrumental analysis, materials science and engineering, and product and process creation, while leveraging expertise in interdepartmental communication, data-driven decisions, and problem-solving.
- **High-Temperature Electronics:** Managed DoD manufacturing technology development projects involving silicon carbide (SiC) and other wide-band gap semiconductors, along with supplemental materials, including high-voltage encapsulation and packaging.
- **Applied Research and Engineering Development:** Developed materials for a wide range of applications. Materials and equipment selection, process development, experimental design, failure analysis, and characterization of coatings for reliability enhancement and risk reduction on electronics and other products. Fixture and tooling design with rapid prototyping using additive manufacturing (3D printing), laser cutting, and machining.

Education

2010 — **Certificate, Project Management** — Wilmington, DE
University of Delaware

2006 — **Postdoctoral Fellowship, Polymer Science and Engineering** — China Lake, CA
Naval Air Warfare Center Weapons Division
- Concentration: Charge Storage Devices (Supercapacitors), Organic Synthesis, Polymer Science, Electrochemistry, Materials and Data Analysis

2005 — **Ph.D., Chemistry** — Los Angeles, CA
University of Southern California
- Concentration: Light-Emitting Materials, Organic Synthesis, Polymer Science, Photophysics, Materials and Data Analysis
- Dissertation: Design and syntheses of polymeric materials for visible and near-infrared emitting applications

1997 — **B.S., Chemistry** — Jacksonville, FL
University of North Florida
- Concentration: Flow Injection Analysis (FIA), Instrumental Analysis, Organic Synthesis, and Physical Chemistry

Professional Appointments

2020 to Present — **Director of Materials Science** — Remote/Morrisville, NC
HZO, Inc.
- **Excellent teamwork and collaboration skills** illustrated by **managing cross-departmental technology development and manufacturing projects** with Production, Engineering, and R&D departments for **driving process enhancements and yield improvements** for barrier and functional coatings for electronic assemblies, sensor die, and many other products.

2019 to 2020 — **Director of Coating Technology** — Morrisville, NC
HZO, Inc.
- **Managed and analyzed coating equipment process and materials properties and performance**, as well as reliability and qualification testing according to industry standards, along with proprietary and customer-specified test and data analysis methods to **drive improvements and recommendations to process and equipment engineers across multiple sites**.

2018 to 2019 **Chemical Engineer** Draper, UT
HZO, Inc.

- **Developed fundamental knowledge and practical expertise for transferring "lessons learned" from R&D to Production across multiple sites** for coating deposition and supplemental processes that **led to over 100M+ parts coated** across consumer electronics and high-reliability product vertical markets.

2014 to 2016 **Chemist and Project Manager** Draper, UT
HZO, Inc.

- **Presented technical data to internal management, customers, and diverse external audiences**, in addition to **representing the company across multiple platforms** with technical publications, conference presentations, webinars, as an invited podcast guest, and serving on standards development committees for the IPC electronics manufacturing trade organization.

2018 to Present **Adjunct Professor** Remote/Salt Lake City, UT
University of Utah

- **Use knowledge of current industry trends and experience** as an advisor-faculty, students, and the Materials Characterization Lab (MCL) in the Department of Materials Science and Engineering (MSE).

2017 to 2018 **Associate Director and Program Manager** Salt Lake City, UT
University of Utah

- **Strong leadership skills and experience** in educating and managing engineering students as the MCL staff for analysis on projects for cross-departmental academic groups and industrial clients.
- **High-level strategic planner with design and marketing skills** as demonstrated by delivering brochures, an updated website, slideshows, outreach programs, and led tours promoting the lab.

2016 to 2019 **CEO, Co-Founder, and Principal Consultant** Draper, UT
Clancy and Associates Technical Services LLC

- **Excellent relationship builder and innovator** with expertise in STEAM fields (science, technology, engineering, arts, and mathematics), **delivering consulting services with practical solutions to development, manufacturing, and process issues**, as well as **advice, instrumental analysis, and training services** to clients in the defense, electronics, materials, and industrial services markets.

2008 to 2014 **Research Associate** Philadelphia, PA
ACI Technologies, Inc.

- **Excellent teamwork and collaboration skills** illustrated by **managing high-value projects in electronics manufacturing through many aerospace industry vendors for the US Navy**, as well as **leading laboratory services for commercial clients in an ISO 9001 Quality System registered facility**, and according to ASTM, IPC, JEDEC, MIL, and other standards.
- **Knowledge of root cause failure analysis and materials characterization, as evidenced by delivery of over 550 project reports with $1M+ in commercial sales.**
- **Experience clearly communicating complex topics**, as illustrated by **eleven articles** for **EMPFasis, a publication of the Electronics Manufacturing Productivity Facility (EMPF)**, with two articles republished in **Printed Circuit Design and Fab/Circuits Assembly: The Journal of Surface Mount and Electronics Assembly**; a **"Failure analysis techniques for electronics" instructional and technical marketing book** with a case studies companion presentation for commercial services and professional skills training courses; and **delivered instruction for professional skills training courses: Failure Analysis and Reliability Testing in Electronics and Electronics Manufacturing Boot Camps.**

2006 to 2008 **Staff Scientist** Newark, DE
NanoSelect, Inc.
- **Designed, synthesized, and analyzed materials for functional coatings for electrodes on integrated circuits** serving as **electrochemical sensors** for analytes in aqueous solution.

2005 to 2006 **ASEE/NRL Postdoctoral Research Fellow** China Lake, CA
Naval Air Warfare Center Weapons Division
- **Designed, synthesized, and characterized electron-deficient (n-type) heterocyclic (nitrogen-containing) monomers and polymers for use in polymeric supercapacitors.**

2000 to 2005 **Graduate Research Assistant** Los Angeles, CA
University of Southern California
- **Designed, synthesized, and characterized conjugated polymers, metal-coordinating ligands, and lanthanide complexes for light-emitting applications**, such as organic light-emitting diode (OLED) displays, chemical sensing, and optical signal amplifiers for telecommunications.

1999 to 2000 **Graduate Research Assistant** College Station, TX
Texas A&M University
- **Designed, synthesized, and characterized conjugated polymers, metal-coordinating ligands, and lanthanide complexes for light-emitting applications**, such as organic light-emitting diode (OLED) displays, chemical sensing, and optical signal amplifiers for telecommunications.

1997 to 1999 **Research Technologist** Jacksonville, FL
Mayo Clinic Jacksonville
- **Synthesized and characterized organic compounds for medicinal research** as diagnostic tools and therapeutic candidates for **muscular and neurodegenerative diseases** in the form of **carbohydrates, amino acids, peptides, monomers, and oligomers of peptide nucleic acids** via solution or solid-phase synthesis, which led to multiple publications for the primary investigators.

Selected Publications and Presentations

Clancy, S. and Askin, R. (2022, January). Behind closed doors: what you don't know about your CVD chamber. *IPC APEX EXPO 2022 Conference*, *San Diego*, *CA*.

Konrad, M. and **Clancy, S.** (2020, September). Episode 52: A Conversation with Conformal Coating Expert Dr. Sean Clancy of HZO. *"Reliability Matters" Podcast*, *Remote*.

Witker, D. L., **Clancy, S.** O., Irvin, D. J., Stenger-Smith, J. D., and Irvin, J. A. (2007, February). Electrochemical deposition of a new n-doping polymer based on bis(thienyl)isopyrazole. *Journal of the Electrochemical Society*, 154(4), G95-G98.

Skills

Management	Engineering, People, Product, Project, Program
Natural Languages	English (native), French (basic), Latin (basic), Experienced using many language translation tools.
Computer-Aided Design (CAD)	AutoCAD, Autodesk Fusion 360, FreeCAD, OnShape, SolidWorks, Tinkercad
Data Science Tools and Data Visualization	R, R Markdown, Git, Jamovi, SQL, Python, Shiny, Tableau
Document Creation, Design, and Editing	Microsoft 365 (Excel, Outlook, PowerPoint, Word, Teams), Google Workspace (Docs, Sheets, Slides), Apple Keynote, Numbers, Pages
Image Analysis	ImageJ (FIJI): Calculate Solder Joint Void Percentage, Contact Angle, Determine Particle Count, Dimensional Analysis, etc.
Self-Hosting Applications and Services	Docker, Linux, macOS, Raspberry Pis, Synology, Windows, Virtual Machines (VMs); Archiving, Text Mining, Webscraping, Wordpress
Manufacturing, Additive	3D Printing, 3D Scanning, Generative Design, Rapid Prototyping, 3D Printing Slicers, 3D Mesh File Processing and Editing, Photogrammetry

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Manufacturing, Electronics	Active and Passive Components, ICs, PCBs, PCBAs, Soldering, Cleaning, Coating, Handling, Enclosures, Design for Manufacturing (DfM), Design for Excellence (DfX), Design for Reliability (DfR)
Manufacturing, Subtractive	SVG File Creation and Editing: Adobe Illustrator, Grid.Space Kiri:Moto, InkScape
Thin Films	ALD, Composites, CVD, Electropolymerization, Hybrid, iCVD, MLD, Multilayer, Nanolaminate, PECVD, PVD, SAMs, Solvent-Based Deposition, Supercritical Carbon Dioxide Infusion, UV-Cured Materials
Technical Services	Computers, Consulting, Failure Analysis, Materials Characterization, Materials Selection, STEAM, STEM, Training
Technology Development	3D-Printed Functional Components and Designs, Bioactive Molecules, Coatings, Electronics, Energy, Semiconductors, Sensors, Technical Services

Chemistry and Materials Science and Engineering	Analytical, Biochemistry, Ceramic, Computational, Electrochemistry, Inorganic, Metal, Organic, Organometallic, Physical, Polymer, Quantum, Synthesis
Electrochemical Processes and Testing	CV, EIS, Immersion Testing, SERA, SIR
Environmental and Regulatory Requirements	California Prop. 65, EPA TSCA, EPEAT, Halogen Content, PFAS, PFOA, PFOS, REACH, RoHS
Environmental Stress Screening	HALT, HAST, Immersion, Ingress Protection (IP), Salt Fog/Spray, Temperature-Humidity-Bias (THB), Thermal Cycling, UV Accelerated Weathering
Imaging	AFM, C-AFM, Digital Photography, Endoscopy, FTIR, Metallography, Multispectral (UV, Visible, Infrared, Thermal, Thermography, Transmission X-Ray), Optical, SEM, SPM, Time-Lapse
Materials and Process Development	Coatings: Anti-Corrosion, Anti-Reflection, Barrier, Biomedical, Charge Storage, Dielectric, Optical, Sensor
Material Properties and Performance Testing	Cross-Sectional Analysis, Fuctionality, Microscopy, Purity and Identity Testing, Spectroscopy, Thermal Analysis
Root Cause Failure Analysis (RCFA)	Cross-Sectional Analysis, Coatings, Fractures, Grain Structures, Intermetallics, Platings, Solder Joints, Failure Mode and Effects Analysis (FMEA)
Spectroscopy	EDS, Ellipsometry, FTIR, MS, NMR, OES, UV-Vis-NIR, XPS, XRD, XRF

Notes

This CV is reproducible. All the source code behind this CV is available on my GitHub repo.