Sean Owen Clancy, Ph.D.

Leader, Scientist, Developer

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Resume
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Profile

- **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.
- **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 for reliability enhancement and risk reduction. Fixture and tooling design with rapid prototyping using additive manufacturing (3D printing), laser cutting, and machining.

Employment History and Work Experience

2024 to Present	**Senior Director of Materials Science**	Remote/Morrisville, NC
2020 to 2024	**Director of Materials Science**	Remote/Morrisville, NC
2019 to 2020	**Director of Coating Technology**	Morrisville, NC
2018 to 2019	**Chemical Engineer**	Draper, UT
2014 to 2016	**Chemist and Project Manager**	Draper, UT

HZO, Inc.

- From the Marketing, Sales, and Technology groups, **demonstrate excellent teamwork and collaboration skills** by **managing cross-departmental technology development and multi-national manufacturing projects** with Production, Engineering, Quality, and Technology departments for **driving process enhancements and yield improvements** for barrier and functional coatings for electronic assemblies, wafer-level and packaged components, anti-reflection (AR) coatings for sensor die, and many other products.
- Optimize coating Chemical Vapor Deposition (CVD) processes using **Design of Experiments (DoE) and statistical analysis methods**, which resulted in a significant reduction in process time and increased precursor material efficiency.
- **Serve as the subject matter expert (SME) for atomic layer deposition (ALD), Parylene chemical vapor deposition (CVD), and conventional conformal coating materials and processes; electronics manufacturing materials and processes; and root cause failure analysis (RCFA), metrology and reliability testing.**
- **Support manufacturing engineers with subject matter expertise for new product introduction (NPI), process development, and troubleshooting.**
- **Present technical data to internal management, potential and existing customers, and diverse external audiences**, in addition to **represent 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.
- **Wrote custom Excel VBA macros to reduce the analysis and reporting time from hours to less than five minutes for generating multiple publication-ready, time series process charts,** *Trained others to use these macros for coating systems installed across North America and Asia, which has also led to significant time reductions in troubleshooting equipment and processes.*
- **Lead a team of consultants, interns, engineers, scientists, and technicians with tasks divided among supporting customer requests, materials characterization, and new technology development.**

2018 to Present **Adjunct Professor** Remote/Salt Lake City, UT
University of Utah
- **Use knowledge of current industry trends and experience** as an advisor to 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.**

Academic Qualifications and Education

2010 **Certificate, Project Management** Wilmington, DE
University of Delaware
- Professional and Continuing Studies Program

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

Selected Publications

Refereed Journal Papers

Perido, J., Denis, K., **Clancy, S.**, Cothard, N. F., Day, P. K., Glenn, J., Leduc, H., Quijada, M., Patel, J., and Wollack, E. (2024, October). Metal-mesh linear variable bandpass filter for far-infrared wavelengths. *Applied Optics*, 63(29), 7674-7681.

Witker, D. L., **Clancy, S.**, 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.

Patents

Askin, R. and **Clancy, S.** (2025, January). Increased deposition efficiency via dual reactor system. *HZO, Inc.*

Janik, J., **Clancy, S.**, and Lawrence, B. (2024, March). In situ polymerization of para-xylene for production of Parylene F-like coating. *HZO, Inc.*

Clancy, S., Lawrence, B., and Niebroski, A. (2023, December). Plasma ashing for coated devices. *HZO, Inc.*

Stevens, B., Yun, Y., and **Clancy, S.** (2020, October). Incorporation of additives into protective coatings. *HZO, Inc.*

Baker, L., **Clancy, S.**, and Hsueh, C.-L. (2020, February). Hybrid parylene-metal oxide layers for corrosion resistant coatings. *HZO, Inc.*

Stevens, B., Yang Yun, Y., and **Clancy, S.** (2017, October). Combining different types of moisture-resistant materials. *HZO, Inc.*

Book

Clancy, S. (2012, December). Failure analysis techniques for electronics. *ACI Technologies, Inc.*

Awards and Honors

2023 **Top Banana Award: Awarded by the head of Marketing and Sales for successful progress by new product development team.** Morrisville, NC
HZO, Inc.

2016 **Certificate of Appreciation for speaking at an SMTA Intermountain Chapter Meeting.** Draper, UT
SMTA Intermountain Chapter

2005 to 2006 **ASEE/NRL Postdoctoral Research Fellowship: Awarded for an ASEE/NRL proposal on the synthesis and computational chemistry of soluble electron deficient (n-type) conjugated polymers.** China Lake, CA
American Society for Engineering Education (ASEE) and the Navy Research Laboratory (NRL)

Selected Skills

Management	Engineering (20+ years), People (10+ years), Product (15+ years), Project (20+ years), Program (15+ years)
Soft Skills	Adaptable, Collaborative, Communication, Creative, Critical Thinking, Emotional Intelligence, Empathy, Innovation, Strategic Thinking, Task Delegation, Team Building
Natural Languages	English (native), Limited understanding of French and Latin (from 5 years French and 4 years Latin in high school). Experienced using many language translation tools.
Computer-Aided Design (CAD)	AutoCAD, Autodesk Fusion, FreeCAD, OnShape, SolidWorks, Tinkercad
Document Creation, Design, and Editing	LaTeX, 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.

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Media Creation, Design, and Editing	Adobe Creative Cloud (Acrobat, Illustrator, InDesign, Photoshop, Premiere Pro), Audacity, GIMP, InkScape, Photo
Self-Hosting Applications and Services	Docker, Linux, macOS, Raspberry Pis, Synology, Windows, Virtual Machines (VMs); Archiving, Text Mining, Webscraping, WordPress
Additive Manufacturing	3D Printing, 3D Scanning, Generative Design, Rapid Prototyping, 3D Printing Slicers, 3D Mesh File Processing and Editing, Photogrammetry
Chemistry and Materials Science and Engineering	Analytical, Biochemistry, Ceramic, Computational, Electrochemistry, Inorganic, Metal, Organic, Organometallic, Physical, Polymer, Quantum, Synthesis
Computational Chemistry	Chemical Structure Drawing, Density Functional Theory (DFT), Molecular Dynamics, Molecular Modeling, Molecular Orbitals, Quantum Chemistry, Spectral Prediction
Cleanliness Testing and Residue Analysis	FTIR, Ion Chromatography, ROSE, SEM-EDS
Data Science Tools and Data Visualization	JMP, Minitab, R, R Markdown, Jamovi, SQL, Python, Shiny, Tableau, Visual Basic (VBA)
Electrochemical Processes and Testing	CV, EIS, Immersion Testing, SERA, SIR
Electronics Manufacturing	Active and Passive Components, ICs, PCBs, PCBAs, Soldering, Cleaning, Coating, Handling, Enclosures, Design for Manufacturing (DfM), Design for Excellence (DfX), Design for Reliability (DfR)
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, Sensors
Material Properties and Performance Testing	Cross-Sectional Analysis, Functionality, Microscopy, Purity and Identity Testing, Spectroscopy, Thermal Analysis
Quality Processes	5S, 8D, Corrective and Preventative Actions (CAPA), Continuous Improvement, Develop Specifications, Establish Inspection Criteria, Process Inspections, Quality Control (QC)
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
Spectroscopic Data Analysis	Bruker OPUS, Spectroscopy Ninja Spectragryph, Thermo OMNIC, Thermo OMNIC Specta, XPS Library Spectral Data Processor (SDP)
Subtractive Manufacturing	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

Notes

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