






Sean Owen Clancy, Ph.D.

Leader, Scientist, Technology Developer, Problem Solver

Curriculum Vitae
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Education

2010	Certificate, Project Management University of Delaware	Wilmington, DE
2006	Postdoctoral Fellowship, Polymer Science and Engineering Naval Air Warfare Center Weapons Division ➤ Concentration: Charge Storage Devices (Supercapacitors), Organic Synthesis, Polymer Science, Electrochemistry, Materials and Data Analysis	China Lake, CA
2005	Ph.D., Chemistry 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	Los Angeles, CA
1997	B.S., Chemistry University of North Florida ➤ Concentration: Flow Injection Analysis (FIA), Instrumental Analysis, Organic Synthesis, and Physical Chemistry	Jacksonville, FL

Professional Appointments

2020 to Present	Director of Materials Science HZO, Inc.	Remote/Morrisville, NC
2019 to 2020	Director of Coating Technology HZO, Inc.	Morrisville, NC
2018 to 2019	Chemical Engineer HZO, Inc.	Draper, UT
2014 to 2016	Chemist and Project Manager HZO, Inc.	Draper, UT
2018 to Present	Adjunct Professor University of Utah	Remote/Salt Lake City, UT
2017 to 2018	Associate Director and Program Manager University of Utah	Salt Lake City, UT
2016 to 2019	CEO, Co-Founder, and Principal Consultant Clancy and Associates Technical Services LLC	Draper, UT
2008 to 2014	Research Associate ACI Technologies, Inc.	Philadelphia, PA
2006 to 2008	Staff Scientist NanoSelect, Inc.	Newark, DE
2005 to 2006	ASEE/NRL Postdoctoral Research Fellow Naval Air Warfare Center Weapons Division	China Lake, CA
2000 to 2005	Graduate Research Assistant University of Southern California	Los Angeles, CA
1999 to 2000	Graduate Research Assistant Texas A&M University	College Station, TX
1997 to 1999	Research Technologist Mayo Clinic	Jacksonville, FL

Publications

Peer Reviewed Journal Articles

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.

Technical Reports

- Stevens, B., Yun, Y., and **Clancy, S. O.** (2020, October). [Incorporation of additives into protective coatings](#). HZO, Inc.
- Cox, B., **Clancy, S. O.**, Yun, Y., Su, T., and Cao, L. (2020, February). [Hybrid parylene-metal oxide layers for corrosion resistant coatings](#). HZO, Inc.
- Clancy, S. O.** and Clancy, M. L. (2018, April). [Parylene optical properties: Why your competitors see Parylene in a new light](#). Vertical Solutions, Inc.
- Clancy, S. O.** and Clancy, M. L. (2018, April). [Parylene chemical properties: Product protection that may surprise you](#). Vertical Solutions, Inc.
- Clancy, S. O.** and Clancy, M. L. (2018, March). [Parylene biocompatibility: It does a body good](#). Vertical Solutions, Inc.
- Clancy, S. O.** and Clancy, M. L. (2018, February). [Parylene electric properties: How Parylene protects sensitive elements](#). Vertical Solutions, Inc.
- Clancy, S. O.** and Clancy, M. L. (2018, January). [Parylene thermal properties: How temperature extremes affect Parylene](#). Vertical Solutions, Inc.
- Clancy, S. O.** and Clancy, M. L. (2017, December). [Parylene barrier properties: Why aren't all my electronics waterproof?](#). Vertical Solutions, Inc.
- Clancy, S. O.** and Clancy, M. L. (2017, December). [Parylene thickness: When a little goes a long way](#). Vertical Solutions, Inc.
- Clancy, S.** (2017, October). [Combining different types of moisture-resistant materials](#). HZO, Inc.
- Clancy, S. O.** and Clancy, M. L. (2017, October). [Your devices aren't as protected as you think without corrosion resistant coating](#). Vertical Solutions, Inc.
- Clancy, S.** (2015, November). [Competitive analysis of Parylene coatings based on metrology](#). Printed Circuit Design and Fab/Circuits Assembly, HZO, Inc.
- Clancy, S.** (2013, December). [Atomic layer deposition \(ALD\) successfully used as a conformal coating for radar components](#). EMPFasis, EMPF, ACI Technologies, Inc.
- Clancy, S.** (2013, June). [New conductive epoxy resin leads-cost reduction of RF tuner systems for JSF](#). EMPFasis, EMPF, ACI Technologies, Inc.
- Clancy, S.** (2012, December). [Failure analysis techniques for electronics](#). ACI Technologies, Inc.
- Clancy, S.** (2012, March). [Technical data package recommendations for open architecture electronics manufacturing](#). EMPFasis, EMPF, ACI Technologies, Inc.
- Clancy, S.** (2010, December). [Reworking ALD coatings](#). EMPFasis, EMPF, ACI Technologies, Inc.
- Clancy, S.** (2010, November). [Avoid the BGA voids](#). Printed Circuit Design and Fab/Circuits Assembly, ACI Technologies, Inc.
- Clancy, S.** (2010, November). [Attaching fiber optic modules](#). EMPFasis, EMPF, ACI Technologies, Inc.
- Clancy, S.** (2010, March). [Surface finish issues affecting solderability and reliability](#). EMPFasis, EMPF, ACI Technologies, Inc.
- Clancy, S.** (2010, August). [Ball grid array \(BGA\) voiding affecting functionality](#). EMPFasis.
- Clancy, S.** (2010, April). [Cleanliness and corrosion mitigation](#). Printed Circuit Design and Fab/Circuits Assembly, ACI Technologies, Inc.
- Clancy, S.** (2009, December). [Cleanliness/corrosion mitigation](#). EMPFasis, EMPF, ACI Technologies, Inc.
- Clancy, S.** (2009, October). [Non-destructive test methods](#). EMPFasis, EMPF, ACI Technologies, Inc.
- Clancy, S.** (2009, May). [Five types of conformal coatings](#). EMPFasis, EMPF, ACI Technologies, Inc.
- Clancy, S.** (2008, November). [Method of detecting contamination](#). EMPFasis, EMPF, ACI Technologies, Inc.

Conference Papers and Presentations

International/National Conferences

- 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.
- Clancy, S.** and Yun, Y. (2014, November). [Protecting electronics from the deleterious effects of liquids and other contaminants at the molecular level](#). IPC-SMTA High-Reliability Cleaning and Conformal Coating Conference 2014, Schaumburg, IL.
- Clancy, S.**, Padmaperuma, A. B., and Harper, A. W. (2003, December). [Energy transfer from polyphenylene-type polymers to a series of dyes](#). The 2003 National Materials Research Society Meeting, San Francisco, CA.
- Clancy, S.**, Padmaperuma, A. B., and Harper, A. W. (2003, November). [Energy transfer from polyphenylene-type polymers to a series of Coumarins and other acceptors](#). The 48th SPIE Annual Meeting, San Diego, CA.

Padmaperuma, A. B., **Clancy, S.**, and Harper, A. W. (2003, March). [The structure-property relationship of conjugated polymers: the effect of heteroaromatic rings and connectivity on photophysical properties](#). *The 225th American Chemical Society National Meeting, New Orleans, LA*.

Invited Talks

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

Clancy, S. (2010, May). [Invited panelist for Nanotechnology Health and Safety, focusing on tin whiskers and other unintended consequences of the Restriction of Hazardous Substances \(RoHS\) Directive](#). Title: "Health, safety, and electronics manufacturing". *Nano for Business 2010 Conference, Lehigh University, Bethlehem, PA*.

Professional Workshops, Webinars, and Trainings

Clancy, S. (2020, August). [Proven methods for achieving advanced product performance and protection from corrosive environments](#). *HZO, Inc, Morrisville, NC/Remote*.

Clancy, S. (2020, July). Mandatory chemical and laboratory safety training sessions. *HZO, Inc, Morrisville, NC/Remote*.

Clancy, S. and Askin, R. (2016, March). [Surface preparation is critical for conformal coating protection](#). *SMTA Intermountain Chapter March Meeting, Draper, UT*.

Clancy, S. (2013, September). Custom one-day lecture course on "Failure analysis and reliability testing in electronics manufacturing". *Electronic Component Manufacturer, New Albany, IN*.

Teaching Experience

Part-Time Experience

2008 to 2014	ACI Technologies, Inc. Electronics Manufacturing Learning Center (EMLC) ➤ Updated curriculum and delivered instruction for professional skills training courses: Failure Analysis and Reliability Testing in Electronics and Electronics Manufacturing Boot Camps.	Philadelphia, PA
2013	ACI Technologies, Inc. Electronics Manufacturing Learning Center (EMLC) ➤ Updated curriculum and delivered a custom one to day lecture course on Failure Analysis and Reliability Testing in Electronics.	New Albany, IN
2012 to 2013	ACI Technologies, Inc. Electronics Manufacturing Learning Center (EMLC) ➤ Updated failure analysis curriculum for Communications-Electronics Research, Development and Engineering Center (CERDEC) electronics manufacturing course sequence for the US Army.	Philadelphia, PA
2001 to 2004	University of Southern California Independent Tutor for Organic Chemistry I and II Lecture Courses ➤ Provided personalized instruction for undergraduate organic chemistry lecture courses.	Los Angeles, CA
2000 to 2001	University of Southern California Organic Chemistry I and II Laboratory Courses ➤ Instructed multiple laboratory sections of undergraduate organic chemistry courses with as many as 30 students per class.	Los Angeles, CA
1999 to 2000	Texas A&M University Organic Chemistry I and II Laboratory Courses ➤ Instructed multiple laboratory sections of undergraduate organic chemistry courses with as many as 30 students per class.	College Station, TX

Other Teaching Experience

2018 to Present	HZO, Inc. Marketing/Sales and Technology/R&D Groups <ul style="list-style-type: none"> ➤ Train teammates on chemical safety and the operation of cleanliness testing, contact angle measurement systems, environmental chambers, handling, microsectioning, microscopy, root cause failure analysis, spectroscopy, sample preparation, and other equipment and test methods. ➤ Provide guidance on RoHS, REACH, California Proposition 65, PFAS, PFOA, and PFOS testing for compliance and safety testing. 	Draper, UT, Morrisville, NC, and Remote
2023 to Present	HZO, Inc. Marketing/Sales Group <ul style="list-style-type: none"> ➤ Manage an internship student working on a Parylene coating process development project from the Mechanical Engineering Department at North Carolina State University. 	Morrisville, NC
Summer 2020	HZO, Inc. Technology/R&D Group <ul style="list-style-type: none"> ➤ Managed a team of summer internship students working on a data analysis project from the Pratt School of Engineering at Duke University. 	Morrisville, NC
2018 to Present	University of Utah Materials Science and Engineering Department <ul style="list-style-type: none"> ➤ Serve as an advisor to full-time faculty, students, and the Materials Characterization Lab (MCL) in the Department of Materials Science and Engineering (MSE). 	Remote/Salt Lake City, UT
2017 to 2018	University of Utah Materials Characterization Laboratory, Materials Science and Engineering Department <ul style="list-style-type: none"> ➤ Trained students and other lab users on chemical safety and the operation of contact angle measurement system, handling, microsectioning, optical and electron microscopy, spectroscopy, sample preparation, and other techniques. 	Salt Lake City, UT
2014 to 2016	HZO, Inc. Technology/R&D Group <ul style="list-style-type: none"> ➤ Trained teammates on chemical safety and the operation of contact angle measurement systems, environmental chambers, cleanliness testing, handling, microsectioning, microscopy, spectroscopy, sample preparation, and other equipment. ➤ Served as a technical consultant and resident Subject Matter Expert (SME) on vacuum deposited and hybrid coatings, as well as conventional conformal coatings, electronics manufacturing materials and processes, cleaning, cleanliness testing, plasma treatment processes, adhesion promotion, manufacturability, and industry best practices. ➤ Presented "Protecting electronics from the deleterious effects of liquids and other contaminants at the molecular level" at the IPC to SMTA High to Reliability Cleaning and Conformal Coating Conference in November 2014. ➤ Presented "Surface preparation is critical for conformal coating protection" at the SMTA Intermountain Chapter Meeting in March 2016 with Robert "Dusty" Askin III. ➤ Wrote "Competitive analysis of Parylene coatings based on metrology" that was published in the November 2015 issue of Printed Circuit Design and Fab/Circuits Assembly. 	Draper, UT
2008 to 2014	ACI Technologies, Inc. Analytical Services Group <ul style="list-style-type: none"> ➤ Trained teammates on the operation of chromatography, cleanliness testing, microscopy, solderability testing, spectroscopy, sample preparation, and other equipment. 	Philadelphia, PA

2008 to 2014	ACI Technologies, Inc. Analytical Services Group, Electronics Manufacturing Productivity Facility (EMPF), and Benchmarking and Best Practices Center of Excellence (B2PCOE) ➤ Served as a technical consultant and resident Subject Matter Expert (SME) on topics regarding atomic layer deposition (ALD); conductive epoxies, conformal coatings, corrosion, high voltage encapsulants, sensor networks for energy management, and others.	Philadelphia, PA
2008 to 2014	ACI Technologies, Inc. Electronics Manufacturing Productivity Facility (EMPF) ➤ Wrote eleven articles for EMPFasis, a publication of the Electronics Manufacturing Productivity Facility (EMPF), of which two were republished in Printed Circuit Design and Fab/Circuits Assembly: The Journal of Surface Mount and Electronics Assembly.	Philadelphia, PA
2008 to 2014	ACI Technologies, Inc. Analytical Services Group, Electronics Manufacturing Productivity Facility (EMPF), and Electronics Manufacturing Learning Center (EMLC) ➤ Wrote "Failure analysis techniques for electronics" instructional and technical marketing book with a case studies companion presentation for commercial services and professional skills training courses.	Philadelphia, PA
2010 to 2012	ACI Technologies, Inc. Analytical Services Group, Electronics Manufacturing Productivity Facility (EMPF), and Benchmarking and Best Practices Center of Excellence (B2PCOE) ➤ Initiated, developed a process, and trained others on eBook production and editing; delivering ePub (.epub) and Mobipocket (.mobi) versions of six books published by ACI that existed previously as print and PDF editions.	Philadelphia, PA
2006 to 2008	NanoSelect, Inc. Analytical, Electrochemical, and Organic Synthesis Group ➤ Wrote Standard Operating Procedures (SOPs) and helped train users to operate the electrochemistry equipment and perform electropolymerizations, as well as organic chemistry methods for surface passivation.	Newark, DE
2005 to 2006	Naval Air Warfare Center Weapons Development Polymer Science and Engineering Group ➤ Wrote SOPs and helped train users to operate the Nuclear Magnetic Resonance (NMR) spectrometers.	China Lake, CA

Awards and Honors

2017	Base Engineering Equipment Fund (BEEF) University of Utah	\$18,646
2016	Certificate of Appreciation for speaking at the SMTA Intermountain Chapter Meeting SMTA Intermountain Chapter	
2015	People's Choice Award – Awarded by a peer for excellence in teamwork. HZO, Inc.	
2014	People's Choice Award – Awarded by the head of HR for excellence in teamwork. HZO, Inc.	
2013	Five Years of Service Award ACI Technologies, Inc.	
2010	Invited Panelist for Nanotechnology Health and Safety, Nano for Business 2010 Conference at Lehigh University, Bethlehem, PA. Nano for Business 2010 Conference	
2005 to 2006	ASEE/NRL Postdoctoral Research Fellowship American Society for Engineering Education (ASEE) and the Navy Research Laboratory (NRL)	\$70,000
2000 to 2005	Research Assistantship [Beckman Foundation Research Fellowship (2000 to 2002), Harold E. Moulton Graduate Fellowship (2004), and Benson Endowed Fellowship (2003 to 2005)] University of Southern California	\$85,000
1997	Above and Beyond Employee Recognition Mayo Clinic	

1997	Dean's List University of North Florida
1997	Founding Treasurer, Student Affiliate American Chemical Society (SA-ACS) University of North Florida
1993 to 1997	University Honors Program University of North Florida
1993	International Baccalaureate (IB) Program Certificate Stanton College Preparatory School
1993	Advanced Placement (AP) Scholar Stanton College Preparatory School

Memberships

- IPC - Association Connecting Electronics Industries (Current)
- SMTA - Surface Mount Technology Association (Current)
- ACS - American Chemical Society (Previous)
- AVS - American Vacuum Society (Previous)
- MRS - Materials Research Society (Previous)
- SPIE - The International Society for Optics and Photonics (Previous)

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
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

(continued)

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](#).