Sean Owen Clancy, Ph.D.

Leader, Scientist, Developer

Curriculum Vitae
June 2025

United States
profiles.faculty.utah.edu/u6013138
me@seanclancy.org
seanclancy
seanclancy
l9IWAtIAAAAJ
0000-0002-3560-1469

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.

Research Interests

- Development of functional materials and manufacturable processes for barrier, biomedical, charge storage, corrosion mitigation, electronics, energy storage, light emission, optical, semiconductor, sensor, and thin film coating applications.
- Data analysis and visualization for monitoring, reporting, and troubleshooting of machine data in additive manufacturing, coating deposition, electronics manufacturing services (EMS), and remote sensing applications, which includes agriculture, building/home automation, citizen science, environmental, and space applications.

Academic Qualifications

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
- Advisor: David Irvin, Ph.D., Chemistry and Materials Division, Polymer Science and Engineering Branch

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
- Advisor: Aaron Harper, Ph.D., Department of Chemistry and the Loker Hydrocarbon Research Institute

1997 — **B.S., Chemistry** — Jacksonville, FL
University of North Florida
- Concentration: Flow Injection Analysis (FIA), Instrumental Analysis, Organic Synthesis, and Physical Chemistry
- Advisor: Stuart Chalk, Ph.D., Department of Natural Sciences

1993 — **Diploma** — Jacksonville, FL
Stanton College Preparatory School
- Concentration: Six-Year Magnet High School Program (7th through 12th Grades) with Advanced Placement (AP), Honors, International Baccalaureate (IB), and Foreign Language (French, 5 Years; Latin, 4 Years) Coursework

Appointments Held and Work Experience

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).

2024 to Present **Senior Director of Materials Science** Remote/Morrisville, NC
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 Chemical Vapor Deposition (CVD) coating processes using **Computer-Aided Design (CAD) of baffles, fixtures, jigs, and tooling**, which improved fluid/vapor flow behavior, thickness uniformity, and coating quality, as well as **Design of Experiments (DoE) and statistical analysis methods**, which resulted in a significant reduction in process time and increased precursor material efficiency.
- **Support manufacturing engineers with subject matter expertise (SME) 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 interns, engineers, scientists, and technicians with tasks divided among supporting customer requests, materials characterization, and new technology development.**

2020 to 2024 **Director of Materials Science** Remote/Morrisville, NC
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 a variety of products.

2019 to 2020 **Director of Coating Technology** Morrisville, NC
HZO, Inc.

- From the Technology group, **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.
- ➤ **Generated and presented 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.

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
- **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 by the primary investigators.

1992 to 1997 **Pharmacy Technician** Jacksonville, FL
Winn-Dixie
- **Assisted pharmacists in accurately preparing medications prescribed by healthcare professionals**, along with providing customer service, managing payments, maintaining inventory, communicating with insurance providers, and training staff on a UNIX-based pharmacy computer system.

Teaching Profile and Curriculum Development

- Presently, rather than formal teaching, I provide guidance and mentorship, sharing my breadth and depth of knowledge as a **subject matter expert (SME)** in **conformal coatings, corrosion mitigation, electronics, semiconductors, surface science, thin films, materials characterization, and data analysis and visualization**.
- **I've taught undergraduate organic chemistry laboratory courses at Texas A&M University and the University of Southern California**.
- **I tutored students in undergraduate organic chemistry lecture courses at the University of Southern California**.
- **I've taught professional development lecture and laboratory courses in electronics manufacturing, as well as failure analysis and reliability testing in electronics at ACI Technologies, Inc., as well as updated and customized the content of those courses**.
- **At the University of Utah, I developed a failure analysis and materials analysis internship program through the Materials Science and Engineering Department's Materials Characterization Laboratory**, but returned to HZO before the first cohort began.
- **At HZO, I provide instruction** through internal training programs, customer meetings, and through internship programs with undergraduate and post-graduate students **in chemical and laboratory safety, coating selection, materials and process development, properties and performance testing, data analysis, and more**.

Previously Taught

Sep 2013 — **Failure Analysis and Reliability Testing in Electronics** — New Albany, IN
ACI Technologies, Inc.
- ➤ Delivered instruction for a custom, one day professional skills training course: Failure Analysis and Reliability Testing in Electronics with as many as 30 students per course.

2008 to 2014 — **Failure Analysis and Reliability Testing in Electronics** — Philadelphia, PA
ACI Technologies, Inc.
- ➤ Delivered instruction for a professional skills training course: Failure Analysis and Reliability Testing in Electronics with as many as 15 students per course.

2008 to 2014 — **Electronics Manufacturing Boot Camp B: Advanced Electronics Manufacturing** — Philadelphia, PA
ACI Technologies, Inc.
- ➤ Delivered instruction for a professional skills training course: Electronics Manufacturing Boot Camp B: Advanced Electronics Manufacturing with as many as 15 students per course.

2008 to 2014 — **Electronics Manufacturing Boot Camp A: Electronics Manufacturing Processes** — Philadelphia, PA
ACI Technologies, Inc.
- ➤ Delivered instruction for a professional skills training course: Electronics Manufacturing Boot Camp A: Electronics Manufacturing Processes with as many as 15 students per course.

2001 to 2004 — **Independent Tutor for Organic Chemistry I and II Lecture Courses** — Los Angeles, CA
University of Southern California
- ➤ Provided personalized instruction to students of undergraduate organic chemistry lecture courses.

2001 — **Organic Chemistry II Laboratory, Course Code: CHEM 325bL** — Los Angeles, CA
University of Southern California
- ➤ Delivered instruction to multiple laboratory sections of an undergraduate organic chemistry course with as many as 30 students per class.

2000 — **Organic Chemistry I Laboratory, Course Code: CHEM 325aL** — Los Angeles, CA
University of Southern California
- ➤ Delivered instruction to multiple laboratory sections of an undergraduate organic chemistry course with as many as 30 students per class.

2000 — **Organic Chemistry II Laboratory, Course Code: CHEM 238** — College Station, TX
Texas A&M University
- ➤ Delivered instruction to multiple laboratory sections of an undergraduate organic chemistry course with as many as 30 students per class.

1999 — **Organic Chemistry I Laboratory, Course Code: CHEM 237** — College Station, TX
Texas A&M University
- ➤ Delivered instruction to multiple laboratory sections of an undergraduate organic chemistry course with as many as 30 students per class.

Courses Developed

2017 to 2018 — **Materials Characterization Laboratory, Materials Science and Engineering Department** — Salt Lake City, UT
University of Utah
- ➤ Developed a failure analysis and materials analysis internship program, but returned to HZO before the first cohort began.

2013 — **Failure Analysis and Reliability Testing in Electronics** — Philadelphia, PA
ACI Technologies, Inc.
- ➤ Updated and condensed the curriculum into a custom, one day professional skills training course: Failure Analysis and Reliability Testing in Electronics.

2012 **Failure Analysis and Reliability Testing in Electronics** Philadelphia, PA
ACI Technologies, Inc.
- ➤ Updated failure analysis curriculum for Communications-Electronics Research, Development and Engineering Center (CERDEC) electronics manufacturing course sequence for the US Army.
- ➤ Updated curriculum for a professional skills training course: Failure Analysis and Reliability Testing in Electronics.

2010 **Failure Analysis and Reliability Testing in Electronics** Philadelphia, PA
ACI Technologies, Inc.
- ➤ Updated curriculum for professional skills training course: Failure Analysis and Reliability Testing in Electronics.

2010 **Electronics Manufacturing Boot Camps A and B** Philadelphia, PA
ACI Technologies, Inc.
- ➤ Updated curriculum for the two part professional skills training course: Electronics Manufacturing Boot Camps A and B.

Other Teaching Experience

2018 to Present **Marketing/Sales and Technology Groups** Draper, UT, Morrisville, NC, and Remote
HZO, Inc.
- ➤ Train lab users 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.

2018 to Present **Marketing/Sales and Technology/R&D Groups** Draper, UT, Morrisville, NC, and Remote
HZO, Inc.
- ➤ Provide guidance on RoHS, REACH, California Proposition 65, PFAS, PFOA, and PFOS testing for compliance and safety testing.

2018 to Present **Materials Science and Engineering Department** Remote/Salt Lake City, UT
University of Utah
- ➤ Serve as an advisor to full-time faculty, students, and the Materials Characterization Lab (MCL) in the Department of Materials Science and Engineering (MSE).

2017 to 2018 **Materials Characterization Laboratory, Materials Science and Engineering Department** Salt Lake City, UT
University of Utah
- ➤ 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.

2014 to 2016 **Technology Group** Draper, UT
HZO, Inc.
- ➤ Trained lab users 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.

2010 **Analytical Services Group, Electronics Manufacturing Productivity Facility (EMPF), and Benchmarking and Best Practices Center of Excellence (B2PCOE)** Philadelphia, PA
ACI Technologies, Inc.
- ➤ 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.

2008 to 2014 **Analytical Services Group** Philadelphia, PA
ACI Technologies, Inc.
- ➤ Trained lab users on the operation of chromatography, cleanliness testing, microscopy, solderability testing, spectroscopy, sample preparation, and other equipment.

2008 to 2014 **Analytical Services Group, Electronics Manufacturing Productivity Facility (EMPF), and Benchmarking and Best Practices Center of Excellence (B2PCOE)** Philadelphia, PA
ACI Technologies, Inc.
- ➤ 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.

2008 to 2014 **Electronics Manufacturing Productivity Facility (EMPF)** Philadelphia, PA
ACI Technologies, Inc.
- ➤ 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.

2008 to 2014 **Analytical Services Group, Electronics Manufacturing Productivity Facility (EMPF), and Electronics Manufacturing Learning Center (EMLC)** Philadelphia, PA
ACI Technologies, Inc.
- ➤ 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.

2006 to 2008 **Analytical, Electrochemical, and Organic Synthesis Group** Newark, DE
NanoSelect, Inc.
- ➤ 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.

2005 to 2006 **Polymer Science and Engineering Group** China Lake, CA
Naval Air Warfare Center Weapons Development
➤ Wrote SOPs and helped train users to operate the Nuclear Magnetic Resonance (NMR) spectrometers.

Mentoring Experience

2023 to 2025 **Mentor: Mohammed Javad "Saeed" Zarei, Ph.D. as Coating Development Intern** Morrisville, NC
HZO, Inc.
➤ Managed an intern working on a Parylene coating process development project from the Mechanical Engineering Department at North Carolina State University.

2023 to 2024 **Mentored: Beomjun Ju, Ph.D. as Coating Development Intern** Morrisville, NC
HZO, Inc.
➤ Managed an intern working on a Parylene coating process development project from the Fiber and Polymer Science Department at North Carolina State University.

2020 **Mentored: Ye Tian as Summer Industrial Research Intern** Morrisville, NC
HZO, Inc.
➤ Managed a team of summer internship students working on a data analysis project from the Pratt School of Engineering at Duke University.

2020 **Mentored: Mingjuan Ling as Summer Industrial Research Intern** Morrisville, NC
HZO, Inc.
➤ Managed a team of summer internship students working on a data analysis project from the Pratt School of Engineering at Duke University.

2020 **Mentored: Jingyuan Dai as Summer Industrial Research Intern** Morrisville, NC
HZO, Inc.
➤ Managed a team of summer internship students working on a data analysis project from the Pratt School of Engineering at Duke University.

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.

Preprint

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 filter for far-infrared wavelengths. *ArXiv*.

Papers in Refereed Conference Proceedings

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

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. *Proceedings of the SPIE-The International Society for Optical Engineering-Volume 5224, Nanomaterials and Their Optical Applications*.

Clancy, S., Padmaperuma, A. B., and Harper, A. W. (2003, December). Energy transfer studies of polyphenylene-type polymers to a series of dyes. *Materials Research Society (MRS) Symposium Proceedings*.

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. *American Chemical Society (ACS) - Polymeric Materials: Science and Engineering (PMSE) Preprints*.

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.*

Patent Applications

Clancy, S. and Tosh, J. (2023, September). Fixtures for chemical vapor deposition gradient coatings. *HZO, Inc.*
Askin, R. and **Clancy, S.** (2021, November). Plasma assisting Parylene deposition. *HZO, Inc.*
Askin, R. and **Clancy, S.** (2021, May). Functional termination of Parylene in vacuum. *HZO, Inc.*
Askin, R., **Clancy, S.**, Janik, J., and Lawrence, B. (2020, April). Plasma ashing of coated substrates. *HZO, Inc.*
Baker, L., **Clancy, S.**, and Hsueh, C.-L. (2017, May). Hybrid parylene-metal oxide interstacked coatings. *HZO, Inc.*
Su, T., **Clancy, S.**, Hsueh, C.-L., Yun, Y., and Cao, L. (2015, December). Protective coatings for electronic devices and atomic layer deposition processes for forming the protective coatings. *HZO, Inc.*

Book

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

Newsletter and Trade Magazine Articles

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, 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, EMPF, ACI Technologies, Inc.*
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.*

Guest Blog Posts

Clancy, S. and Clancy, M. L. (2018, April). Parylene optical properties: Why your competitors see Parylene in a new light. *Vertical Solutions, Inc.*
Clancy, S. and Clancy, M. L. (2018, April). Parylene chemical properties: Product protection that may surprise you. *Vertical Solutions, Inc.*
Clancy, S. and Clancy, M. L. (2018, March). Parylene biocompatibility: It does a body good. *Vertical Solutions, Inc.*
Clancy, S. and Clancy, M. L. (2018, February). Parylene electric properties: How Parylene protects sensitive elements. *Vertical Solutions, Inc.*
Clancy, S. and Clancy, M. L. (2018, January). Parylene thermal properties: How temperature extremes affect Parylene. *Vertical Solutions, Inc.*
Clancy, S. and Clancy, M. L. (2017, December). Parylene barrier properties: Why aren't all my electronics waterproof?. *Vertical Solutions, Inc.*
Clancy, S. and Clancy, M. L. (2017, December). Parylene thickness: When a little goes a long way. *Vertical Solutions, Inc.*

Clancy, S. and Clancy, M. L. (2017, October). Your devices aren't as protected as you think without corrosion resistant coating. *Vertical Solutions, Inc.*

Conference Presentations and Invited Talks

International/National Conferences

Clancy, S. (2022, October). Ensuring long-term performance while managing affordability and environmental impact – Developments in electronics conformal coatings and related processes. *The Nanotechnology Show 2022, Pittsburgh, PA.*

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, November). Energy transfer from polyphenylene-type polymers to a series of Coumarins and other acceptors. *The 48th SPIE Annual Meeting, San Diego, CA.*

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.*

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.*

Regional Conferences

Zarei, M. and **Clancy, S.** (2023, November). Parylene CVD coating processes and test methods for evaluating coating properties and performance *(Presented by Saeed Zarei).* *Carolina Science Symposium 2023, Raleigh, NC.*

Clancy, S. (2003, April). Energy transfer from polyphenylene-type polymers to a series of dyes. *The 31st Annual Stauffer Symposium, University of Southern California, Los Angeles, CA.*

Clancy, S. (2002, April). Electron transport materials based on cyclodiborazane. *The 30th Annual Stauffer Symposium, University of Southern California, Los Angeles, CA.*

Invited Talks

DuBose, B. and **Clancy, S.** (2024, October). Corrosion in electronics: Common causes and solutions. *"Materials Performance, AMPP Interview Series" Podcast.* YouTube Link

Konrad, M. and **Clancy, S.** (2020, September). Episode 52: A conversation with conformal coating expert Dr. Sean Clancy of HZO. *"Reliability Matters" Podcast.* YouTube Link

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 and Webinars

Clancy, S., Schueller, R., Genthe, C., and Leone, P. (2024, May). Creep corrosion in electronics: A panel discussion. *IPC Engineering Webinar Series.* Vimeo Link

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

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". *Electronic Component Manufacturer, New Albany, IN.*

Awards and Honors

2023	**Top Banana Award: Awarded by the head of Marketing and Sales for successful progress by new product development team.** HZO, Inc.	Morrisville, NC
2016	**Certificate of Appreciation for speaking at an SMTA Intermountain Chapter Meeting.** SMTA Intermountain Chapter	Draper, UT

2015	**People's Choice Award: Awarded by a peer for excellence in teamwork.** HZO, Inc.	Draper, UT
2014	**People's Choice Award: Awarded by the head of HR for excellence in teamwork.** HZO, Inc.	Draper, UT
2013	**Five Years of Service Award** ACI Technologies, Inc.	Philadelphia, PA
2010	**Invited panelist for nanotechnology health and safety, Nano for Business 2010 Conference at Lehigh University.** Nano for Business 2010 Conference	Bethlehem, PA
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.** American Society for Engineering Education (ASEE) and the Navy Research Laboratory (NRL)	China Lake, CA
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)]: Awarded for successful progress during my graduate studies and work as a Graduate Research Assistant in the USC Department of Chemistry and the Loker Hydrocarbon Research Institute.** University of Southern California (USC)	Los Angeles, CA
1997	**Above and Beyond Employee Recognition: Awarded for successful anti-sense (RNA-binding) and anti-gene (DNA-binding) experiments using the peptide nucleic acid (PNA) sequences that I synthesized.** Mayo Clinic	Jacksonville, FL
1997	**Dean's List** University of North Florida (UNF)	Jacksonville, FL
1997	**Founding Treasurer, Student Affiliate American Chemical Society (SA-ACS)** University of North Florida (UNF)	Jacksonville, FL
1993 to 1997	**University Honors Program** University of North Florida (UNF)	Jacksonville, FL
1993	**International Baccalaureate (IB) Program Certificate** International Baccalaureate Organization (IBO) via Stanton College Preparatory School (SCPS)	Jacksonville, FL
1993	**Advanced Placement (AP) Scholar** Advanced Placement (AP) Program at the College Board via Stanton College Preparatory School (SCPS)	Jacksonville, FL

Continuing Education

Certifications

2024, October. **AI Applications of Machine Data in the EMS Industry. Instructor: Tim Burke, Ph.D.**, *IPC International, Inc.*
2024, February. **Correlation and Regression – Statistical Thinking for Industrial Problem Solving (STIPS)**, *SAS, JMP* View credential.
2024, February. **Decision Making with Data – Statistical Thinking for Industrial Problem Solving (STIPS)**, *SAS, JMP* View credential.
2024, February. **Design of Experiments – Statistical Thinking for Industrial Problem Solving (STIPS)**, *SAS, JMP* View credential.
2024, February. **Exploratory Data Analysis – Statistical Thinking for Industrial Problem Solving (STIPS)**, *SAS, JMP* View credential.
2024, February. **Quality Methods – Statistical Thinking for Industrial Problem Solving (STIPS)**, *SAS, JMP* View credential.
2024, February. **Statistical Thinking and Problem Solving – Statistical Thinking for Industrial Problem Solving (STIPS)**, *SAS, JMP* View credential.
2013, October. **Certificate in Digital Analytics Fundamentals**, *Google Analytics Academy*
2013, June. **IPC-A-600 Acceptability of Printed Boards Training and Certification (June 2013) – Certified IPC Specialist, Serial #: 600-S 4509, Expired June 2015**, *IPC International, Inc.*, *Inc. via ACI Technologies, Inc.*
1998, June. **Hazardous Materials Technician Training for Chemical Spill Team**, *Mayo Clinic*
1997, June. **Amateur Radio Operator License, Technician Class License**, *Federal Communications Commission (FCC)*

Short Courses

2021, November. **Becoming an Effective Leader. Instructor: Becky Williams, REALM Leadership**, *HZO, Inc.*

2019, October. **Nanotechnology: A Maker's Course**, *Coursera*
2017, June. **Radiation Safety Training for Analytical X-Ray, Radiation Safety Office, University of Utah, Salt Lake City, UT**, *University of Utah*
2016, March. **Failure Analysis for Improved Reliability. Instructor: Bhanu Sood, NASA**, *IPC International, Inc., IPC APEX 2016 Conference*
2016, March. **Robust Coating Processes in the Factory: Methods, Critical Parameters, Problems, and Remedies. Instructor: Douglas Pauls, Rockwell Collins**, *IPC International, Inc., IPC APEX 2016 Conference*
2016, March. **Cleaning for Reliability: How Clean is Clean? Instructor: Mike Bixenman, Kyzen Corporation**, *IPC International, Inc., IPC APEX 2016 Conference*
2016, March. **Printed Circuit Board (PCB) Fabrication Basics: Process and Specifications. Instructor: Jim Vanden Hogen, Plexus**, *IPC International, Inc., IPC APEX 2016 Conference*
2016, February. **Employment Law for Managers. Instructor: Jonathan K. Driggs, Attorney at Law, P.C.**, *HZO, Inc.*
2014, December. **Engineering Best Practices. Instructor: Dan Triplett, HZO Principal Engineer**, *HZO, Inc.*
2012, October. **Atomic Layer Deposition (ALD) Short Course. Instructor: Steven George, Ph.D.**, *American Vacuum Society (AVS) Southern California Chapter Short Course Program, University of California at Los Angeles (UCLA)*
2009, February. **Benchmarking and Best Practices**, *Benchmarking and Best Practices Center of Excellence (B2PCOE), ACI Technologies, Inc.*
2008, June. **Failure Analysis and Reliability Testing in Electronics**, *Electronics Manufacturing Productivity Facility (EMPF), ACI Technologies, Inc.*
2008, May. **Electronics Manufacturing Boot Camp B: Advanced Electronics Manufacturing**, *Electronics Manufacturing Productivity Facility (EMPF), ACI Technologies, Inc.*
2008, May. **Electronics Manufacturing Boot Camp A: Electronics Manufacturing Processes**, *Electronics Manufacturing Productivity Facility (EMPF), ACI Technologies, Inc.*

Service

Advisory Councils

2024 to Present **Advisory Council on Electric Vehicle Quality and Reliability (EVQR) for the Global Electronics Association** Remote
HZO, Inc.
- ➤ Serve on the IPC's V-EVQR E-Mobility Quality and Reliability Advisory Council to help ensure quality, reliability, and safety to grow knowledge and develop solutions to e-Mobility and automotive challenges and help deliver high quality, high reliability electronic hardware in battery management systems (BMS), charging stations, and inverters.

2022 **Advisory Board for "The Nanotechnology Show 2022" with Event Partners Limited** Remote
HZO, Inc.
- ➤ Served on the Board for the Nanotechnology Show 2022 and provided guidance on directions in environmental, health, and safety concerns regarding materials used in coatings and related nanotechnology industries, along with the reliability and sustainability for electronics and other markets when using nanometer and micrometer-thick thin film conformal coatings.

Standards Development Committees

2014 to Present **Industry Standards Development Committees for the Global Electronics Association** Remote/Various
Conferences
HZO, Inc.
- ➤ Serve on standards development committees for conformal coatings, cleaning processes, solder masks, corrosion of metal surfaces, and more.

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, Technical Writing
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
Data Science Tools, Statistical Analysis, and Visualizations	JMP, Minitab, R, R Markdown, Jamovi, SQL, Python, Shiny, Tableau, Visual Basic (VBA)
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, Moiré Pattern Analysis
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	Chemical, Plasma, and Laser Ablation, Ashing, and Etching Processes; Laser Cutting/Etching and Machining Processes
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	Cyclic Voltammetry (CV), Electrochemical Impedance Spectroscopy (EIS), Immersion Testing, Sequential Electrochemical Reduction Analysis (SERA), Surface Insulation Resistance (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	Anti-Corrosion, Anti-Reflection, Barrier, Biomedical, Charge Storage, Dielectric, Optical, Sensor
Material Properties and Performance Testing	Barrier Testing, Cross-Sectional Analysis, Electrical Testing, Functionality, Microscopy, Profilometry, Purity and Identity Testing (GC-MS, HPLC, IC, GPC, SEC, TLC), Spectroscopy, Thermal Analysis
Root Cause Failure Analysis (RCFA)	Bond Pads, Bonding Wires, Cleaning, Coatings, Contamination, Corrosion, Counterfeit, Cracks, Electrical Overstress (EOS), Electrostatic Discharge (ESD), Failure Mode and Effects Analysis (FMEA), Flip Chip, Fractures, Grain Structures, Intermetallics, Leads, Metallization, Package, Passivation, Platings, Solder Joints, Surface Finishes, Surface Preparation, Wetting
Spectroscopy	DRIFTS, EDS, Ellipsometry, FTIR, MS, NMR, OES, UV-Vis-NIR, XPS, XRD, XRF

Current Memberships

- Global Electronics Association [Formerly, the IPC (Association Connecting Electronics Industries)]
- SMTA (Surface Mount Technology Association)

Endorsements

2021, **Benjamin Lawrence**, **Worked together at HZO, Inc.:** *Sean ranks among one of the best people I met in my career, ranging from technical ability, management capabilities, strategic understanding, and personal skills. He is highly capable in any topic ranging from organic chemistry, polymers, and spectroscopy, as a true expert in the field, and among many others. The most important part is that he is a great person, an upfront and quality individual. He will always tell you the truth, even if it is sometimes difficult, and cares tremendously about those around him, with the personal skills to navigate even challenging work environments. He is somebody that you want on your team.*

2016, **Alex Anderson**, **Worked together at HZO, Inc.:** *Sean not only has deep knowledge in chemistry and materials but broad engineering knowledge that is very helpful in our product development and testing efforts. He is a 'go-to' guy when you have a difficult problem to solve and is not constrained by his previous experience and can offer multiple solutions to a given problem. Additionally, his advice is very decisive and helpful in focusing on the most likely path to pursue for a solution to the problem at hand. I highly recommend Sean.*

2016, **Colleen Gallagher**, **Worked together at HZO, Inc.:** *Sean is just one of those people you know that is going to go above and beyond what is required the moment you start to interact with him. He is articulate in the way that he communicates and shares his ideas. He steps up to the plate to assist in anyway he can and gives 100%. He encourages his teammates. Provides positive support, even in difficult situations. He always looks for the best solution to problems and is always looking at continuous improvements to processes and procedures. Sean is an asset to any organization.*

2016, **Dan Quale**, **Worked together at HZO, Inc.:** *Sean Clancy has a Ph.D. in Chemistry with tons of experience in product development and materials analysis for advanced technology applications in academic, government, commercial, and medical research groups. Rarely can the skills of extreme attention to detail, great interpersonal skills, vision and foresight, and meticulous tactical implementation be found in a single individual. It is a distinct pleasure to recommend Sean. I have worked closely with him on a number of projects at HZO and he is one of the most outstanding individuals I have ever worked with. I believe he would make a superlative addition at any company. He continuously exceeds expectations, willingly accepts challenges and makes key critical contributions in every aspect of the business.*

2011, **Anand Bhavankar**, **Worked together at ACI Technologies, Inc.:** *Sean and I have worked on multiple projects. Our expertise are in different areas and Sean has been very helpful in explaining and performing environmental testing and material analysis for all the projects I was involved in ACI. Thanks for all your support Sean.*

2008, **Anthony Vigliotti**, **Worked together at ACI Technologies, Inc.:** *Dr. Clancy has solid experience with regards to analytical and physical chemistry. His work greatly improved the business capability of the company and provided insight to the group. He has superb writing skills, good work ethic and character. I appreciated the time that I worked with Sean.*

2008, **Ozgenc Ebil**, **Worked together at NanoSelect, Inc.:** *I've had the privilege to work with Dr. Clancy. He is an expert in his field and has the ability to bring new and innovative ideas to many problems that are (or at least seemed) difficult to solve. On a personal level, he has an amicable personality and a desire to invest in others, qualities critical in research, teaching and building professional relationships.*

2008, **Adam Closson**, **Worked together at Naval Air Warfare Center Weapons Development:** *Sean is an accomplished and talented scientist that I have had the pleasure of collaborating with. His technical skills are unrivaled and he approaches each problem with an appropriate strategy. Sean is a conscientious worker and a very personable colleague.*

Notes

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