Kliah Soto Leytan

Ph.D.

Staff Consultant

Dr. Kliah Soto Leytan provides engineering consulting in the fields of materials science, metallurgy, and materials characterization. She conducts scientific and engineering investigations focused on failure analysis of materials that have undergone corrosion, fracture, fatigue, and other forms of material degradation. Dr. Soto Leytan is skilled in laboratory testing, running failure analysis laboratory inspections, materials characterization of polymers, metals, and composite materials, as well as performing field inspections. Her investigative experience spans analytical, industrial, and litigated matters on consumer products, transportation (including aviation and automotive), weld failures, and construction defect projects.

Her technical proficiencies include optical microscopy, metallography, scanning electron microscopy (SEM), and energy dispersive X-ray spectroscopy (EDS). Dr. Soto Leytan is fluent in Spanish.

Education

Ph.D., Materials Science and Engineering, University of California, Irvine. 2019

M.S., Materials Science and Engineering, University of California, Irvine. 2014

B.A., Physics and Mathematics, Occidental College. 2012

Languages

- Spanish
- English

Positions Held

Engineering Systems Inc., Anaheim, California

- Staff Consultant, 2024 – Present

Grift Swap Central, Irvine, California

- Project Manager, Software Developer, 2022 – 2024

Contact Information

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Areas of Specialization

- Failure Analysis & Root Cause Investigations
- Fractography
- Corrosion
- Consumer Products/Product Liability
- Construction Defect Investigations
- Field Inspections
- Laboratory Services
- Materials Characterization
- Mechanical Testing of Materials
- Gas Turbine Components

University of California, Irvine, California

- Postdoctoral Researcher, Materials Science and Engineering, 2020 - 2022
- Research Assistant, Materials Science and Engineering, 2013 – 2019

Project Experience

Investigations

Consumer Products

- Performed failure analysis investigations of a variety of consumer products to determine cause of failure, including materials selection and manufacturing deficiencies. Examples include chairs/stools, skates, fire alarms, cutting blades and hand tools, and dishwasher detergent.

Construction Defect

- Performed site inspections and field investigations to assess plumbing and pipe issues such as manufacturing contributions, physical damage, and/or environmentally accelerated degradation. Conducted laboratory tests and material analyses to determine root causes. Experience working with copper, PEX, Polypropylene, PVC, and CPVC.
- Conducted laboratory tests of mortar and stucco materials to evaluate their quality and integrity. Made use of computed tomography (CT) to study the internal structure, including presence of cracks, excessive porosity, and lath corrosion. Coupled CT data with materialographic sample preparation and cross-sectional analysis.
- Conducted a failure analysis investigation on fiber cement siding products to assess the presence of potential product deficiencies.
- Conducted laboratory tests on a building façade system composed of stucco, mortar, and adhered manufactured stone veneers (AMSV). Performed root cause analysis of AMSV debonding using CT and SEM/EDS to identify the source.
- Conducted laboratory testing of insulated glass units (IGU) to evaluate window sealants and their accelerated degradation.

Transportation

- Materials investigation of a helicopter incident involving failure of a composite structure.
- Materials testing and weld evaluation of an automobile seat involved in a car crash.
- Materials testing of an automobile axle involved in a car crash.

Fire Investigations

- Conducted site inspections and provided materials expertise for commercial and wildfire investigations.

- Conducted metallographic evaluation of conductor materials and other site artifacts to identify evidence of arcing and abnormal electrical activity.

Insurance and Subrogation Claims

- Conducted laboratory tests and failure analysis investigations involving both stainless steel and polymer water supply lines, as well as water fixtures that resulted in water damage claims.
- Failure analysis of water filters, water heaters, bidets, toilets, gas supply lines, refrigerator filters, etc. to determine cause of failure.

Industrial Projects

- Performed fractography analysis to determine cycles to failure for manufacturing tools.
- Evaluation of aluminum and steel welds to determine cause of failure. A combination of CT and metallographic sample preparation and cross-sectional analysis revealed weld discontinuities that contributed to failure.

Publications

"Investigation of Visible Light Emission from Hydrogen-Air Research Flames," **K. Soto Leytan**, Y. Zhao, V. McDonell, S. Samuelsen, International Journal of Hydrogen Energy, Vol. 44, Issue 39, pp 22347–22354, August 2019

"Controlling splat boundary network evolution towards the development of strong and ductile cold sprayed refractory metals: The role of powder characteristics," **K. Soto Leytan**, M. Amiri, D. Apelian, D. R. Mumm, L. Valdevit, Materials Science and Engineering: A, Vol. 902, June 2024

Presentations

"Influence of Hydrogen Content on the Microstructure of Tantalum Cold Spray Coatings," **K. Soto Leytan**, M. Amiri, D.R. Mumm, L. Valdevit, CSAT 2021, Virtual

"Evaluation of Type I Hot Corrosion Resistance of Marinized Materials Through Low Velocity Burner Rig Testing," **K. Soto Leytan**, D.R. Mumm, TMS 2018 in Phoenix, AZ

"Effect of Fuel Content on Type I Hot Corrosion Attack in Low Velocity Burner Rig and Development of an Automated Image Analysis Sample Assessment Protocol for Evaluating Extent of Attack," **K. Soto Leytan**, D.R. Mumm, High Temperature Corrosion and Protection of Materials 2016 in Les Embiez, France

"Automated Image Analysis for Determining the Extent of Hot Corrosion Attack in Evaluating Potential 'Marinized' Turbine Hot Section Materials," **K. Soto Leytan**, D.R. Mumm, MS&T 2015 in Columbus, OH

"Low Velocity Burner Rig Study of Hot Corrosion in Turbine Components" **K. Soto Leytan**, D.R. Mumm, Gordon Research Conference 2015 in New London, NH

"Automated Image Analysis Sample Assessment Protocol for Evaluating Extent of Hot Corrosion Attack in Burner Rig Tests," **K. Soto Leytan**, D.R. Mumm, Faculty for the Future Forum 2015 in Boston, MA

“Hot Corrosion of Shipboard Turbine Components in a Low Velocity Burner Rig Using Alternative Fuels,” **K. Soto Leytan**, D.R. Mumm, Gordon Research Conference 2014 in South Hadley, MA