

David V. Niebuhr, Ph.D., P.E.

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Executive Summary

- Metallurgical & Mechanical Engineer with over 25 years of experience
- Areas of practice: ferrous alloy processing & behavior, failure analysis & prevention, materials analysis & selection in product development.
- Areas of expertise: physical metallurgy, failure analysis, degradation mechanisms (corrosion and wear) and characterization of materials
- Experienced director of hundreds of projects with total revenue greater than \$250 million

Professional Experience

President, Niebuhr Metallurgical Engineering, Inc. • 2005 – Present

San Luis Obispo, California

- Responsible for managing operation, marketing & business development
- Domestic and International customer base
- Emphasis on failure analysis of industrial and consumer products, including product development, design and materials selection
- Expert witness testimony in both civil / criminal court and state / federal court
 - Retained as expert in 50+ cases
 - Extensive Deposition and Trial testimony experience
- Industries served include: manufacturing/ consumer products, high technology, aerospace, oil & gas

Adjunct Professor, California Polytechnic State University • 2007 – Present

San Luis Obispo, CA

- Instructor in Mechanical & Architectural Engineering Departments
- Responsible for development and instruction of undergraduate lectures & labs
- Metallurgical consultant for students and faculty.

Director of Forensic Business Unit, Intertek • 2011 – 2013

Sunnyvale, California

- Metallurgical / Materials Engineer determining root cause failures of systems and/or components. Recommended material modifications and/or process changes to customer
- Expert in materials degradation mechanisms, including corrosion, wear & fracture
- Specified and oversaw materials characterization using local analytical labs
- Responsible for managing group with \$4M in annual consulting projects
- Testifying Expert in Legal and Insurance (subrogation) claims (state & federal court)

Professor of Materials Engineering, California Polytechnic State University • 1999 - 2006
San Luis Obispo, California

- Developed and instructed ~12 courses (4 new) for undergraduate and graduate students, including Failure Analysis, Corrosion, Tribology, NDE, Materials Characterization & Physical Metallurgy
- Active researcher and consultant in failure analysis, corrosion and tribology
- Managed research grants (\$500k) while employing graduate and undergraduate students
- Acquired research equipment leveraging industry grants with state money
- Technical Advisor (failure analysis and tribology) for College of Engineering

Visiting Scholar, Jet Propulsion Laboratory (California Institute of Technology) • 2001-2002
Pasadena, California

- Research project to evaluate wear and friction in low pressure CO₂ environments
- Atomic Force Microscopy project investigating friction in several inert atmospheres as compared to ambient conditions.
- Research project characterizing CdSe Quantum Dots (QD) via Atomic Force Microscope (AFM)
 - Analysis of shape and morphology as a function of QD synthesis parameters
 - Design of experiments to evaluate how synthesis parameters influenced size and properties
 - Measurement & characterization of photoluminescence properties

Design Engineer / Tribologist, Quantum Corporation • 1997-1999
Milpitas, California

- Team Leader, Hydrodynamic Bearings (HDB) development group
- Responsible for implementation and testing of (HDB) spindle motors into three drive programs
- Materials / Wear / Failure Analysis consultant responsible for designing, testing and evaluating new materials for a wide variety of cross-departmental projects
- Designed & Purchased \$100k materials analysis lab which streamlined HDB wear evaluation

Academic Preparation

Ph.D. Materials Science and Engineering 1997
Oregon Health Science University, Portland, Oregon
Concentrations: Tribology (Wear) and Materials Characterization
Dissertation: Self-Lubricating Composite Plasma Sprayed Coatings
Advisor: Dr. Paul Clayton (deceased)

B.S. Materials Engineering 1993
California Polytechnic State University, San Luis Obispo, California
Senior Project: Hydride Kinetics in Zirconium lined, Zircaloy™ (UO₂) Fuel Rods

P.E. Licensed Professional Engineer (Metallurgical), State of California. License # 1957

Notable Projects (Examples of 500 + Projects)

- Analysis of organic coating failure in 30,000 gallon orange juice storage tank
- Delamination analysis of composite and aluminum support structure from Cessna 310 wing spar
- Failure analysis of Mercedes automotive subframe failures due to failure of organic coating
- Corrosion analysis and assessment of damage of Tesla Model S (retained by Tesla)
- Investigation of Toyota Tacoma frame failures due to oxidation (class-action)
- Failure analysis of rebar soil nails used to support decorative concrete fascia
- Damage assessment large structures following exposure to concentrated sulfuric acid fumes
- Development of carbide hardened tool steel for industrial knives & cutting tools
- Process development for improved IF sheet steels for extreme forming applications
- Patent analysis regarding repurposing dry oil wells for hydrogen storage
- Modification of 904L stainless steel for improved resistance to sulfidation
- Investigation of weld cracking in class 300 20 inch pipe flanges for Shell Oil
- Selection of steel alloys for underground salt cave hydrogen storage
- Development of weld pre and post heating process for 30-inch oil pipe and flange
- Pipeline cracking assessment in sour gas supply pipes
- Patent analysis of indium tin oxide thin film coatings used in capacitive displays
- Boiler tube Assessment of oxidation, wall thinning and prediction of remaining service life (multiple projects in this area)
- Failure analysis of corroded & leaking 100,000 gallon crude oil tank
- Corrosion and fretting fatigue failure analysis of pipe joint subjected to high frequency vibration
- Weld procedure development for ASTM grade 70-40 steel valve used in a hydroelectric plant
- Failure analysis of 904L stainless steel in the presence of concentrated sulfuric acid
- Failure analysis of a closed loop water cooling system / analysis of corrosion products
- Corrosion and fatigue failure of surgical steel blades
- Characterization of corrosion inhibiting coating for use in Toyota truck frames
- Patent analysis of hinge design and materials used in laptop computers
- Failure analysis of fractured hip implant (multiple projects on this topic)
- Metallurgical advisor to small rotary engine start-up company based in Indio, CA
- Weld procedure development for ASTM grade 70-40 steel valve used in a hydroelectric plant
- Failure analysis of thermal printers used in Ziosk™ table ordering tablet
- Characterization of sintered oxide ceramics used in precision measuring devices
- Failure analysis of aviation radar system due to degradation of dielectric coating in waveguide.
- Assessment of magnetron durability in commercial microwave ovens
- Wear analysis of nitrided stainless steel used in commercial food production plants
- Fracture analysis of hip implants that failed during use (multiple studies in this subject)
- Assessment of corrosion on cigarette boat outboard drive caused by neglect
- Wear behavior of MIM (metal injection molding) components used in consumer devices
- Analysis of beta design compact microwave ovens to increase efficiency
- Investigation of small refinery fire caused by wiring damage in control panel of light machinery
- Characterization and analysis of MIM (metal injection molding) medical/surgical components
- Investigation of hydrogen embrittlement and subsequent fire in high pressure natural gas pipe
- Analysis of electric residential stove that energized unexpectedly causing apartment fire

Expert Witness (Trials)

September 2022

Rodriguez vs City of Santa Maria Case, No 19-CV04142, Santa Barbara County, CA
Represented plaintiff who was sprayed in face with high pressure sewer cleaning hose

August 2022

Lipinski vs B&G Wire, Nucor, et al. No GD 14-009709, Allegheny County, PA
Represented plaintiff who was injured when rebar fractured suddenly during construction

July 2022

Schwag vs. Vonteuber Case No. 56-2019-00527546, Ventura County, CA
Represented Defendant accused of causing bot a corrosion via a submerged electrical outlet

June 2021

USA vs. Bryan, Case No.:3:19-cr-00060+MMD-WGC USA v. Bryan, Reno Federal Court
Represented defendant who claimed self-defense after murdering his son with a firearm

October 2019

Tabletop Media LLC vs Citizen Systems of America Corporation; Citizen Systems Japan
No. 2:16-cv-07140_PSG-ASW, Los Angeles Federal Court
Represented Plaintiff who claimed the printers supplied by Citizen were inferior and did not meet operational requirements

September 2015

McKinley Jacobs, et al. vs Walters Bus Service; No. 04 L 11470 Cook County, IL
Represented Plaintiff who was injured when a chartered bus rolled over and the roof collapsed killing and severely injuring over 25 people

August 2009

Keller vs. Schering-Plough, et al. Los Angeles, CA Federal Court
Represented Plaintiff who was severely injured when the lithium battery in a handheld massager exploded raining molten plastic on to his hands and body

May 2005

Saberi vs Paso Robles Tank, Monterey County, CA
Represented defendant who had retrofitted above ground storage tank (AST). Plaintiff claimed defendant caused tank to leak by creating a defect in the tank floor

April 2003

The People of the State of California vs. Jose Maria Iniguez, Case No 030001513
San Luis Obispo County, CA
Represented DA to offer an opinion on the condition of a horse trailer with a broken hinge that allowed a horse to be ejected from the trailer and collide with a vehicle killing all three occupants

Expert Witness (Depositions)

August 2022 – Rodriguez vs City of Santa Maria Case No 19-CV04142 (Plaintiff)
September 2021 – Schwag vs. Vonteuber Case No 56-2019-00527546 (Defense)
June 2021 – MacBook Keyboard Litigation Case No. 5:18-cv-02813-EJD-VKD (Plaintiff)
September 2020 – MacBook Keyboard Litigation Case No. 5:18-cv-02813-EJD-VKD (Plaintiff)
July 2020 – Sanchez vs Linn Energy LLC, et al., Case No: S-1500-CV-283816-SDS (Defense)
July 2019 – Jason Fong vs Donna J. Wood, et al. Case No: 17CIV02038 (Defense)
December 2018 and August 2018 – TableTop Media LLC vs Citizen Systems Corp. No. 2:16-cv-07140_PSG-ASW (Plaintiff)
September 2015 – McKinley Jacobs, et al. vs Walters Bus Service; No. 04 L 11470 (Plaintiff)
May 2015 and July 2015 –Burkhart vs. Nautilus, (Case No. 1414888) (Plaintiff)
October 2012 – Joseph Royse vs. PG&E, Eureka, CA (Case No. unknown) (Plaintiff)
September 2010 – Lennox Procurement Company, Inc. vs. JW Aluminum Company (Case No. 08-13252) (Defense)
November 2005 – Lawrence Donville vs. Georgie Boy Manufacturing, LLC. (Plaintiff)
May 2005 - Saberi vs Paso Robles Tank, Monterey County, CA (Defendant)
October 2003 – Compton vs. American Honda Motor Company, et al. (Plaintiff)
Four additional depositions during time at Intertek (2011-2013)
Topics
Cause and origin of microwave fire in NY apartment building (plaintiff)
Defective saw blade that resulted in personnel injury (defense)
Defective edger blade on lawn mower resulted in personnel injury (defense)
Fractured pipeline resulting in small oil spill (on-sight at refinery) (defense)

Technical Publications (Public Domain only)

Niebuhr, D., "Friction and wear behavior of engineering alloys in a simulated martian (CO₂) environment, a preliminary study," 16th International Conference on Wear of Materials, Volume 263, Issues 1-6, 10 September 2007, pp. 88-92.

Niebuhr, D. "Cavitation erosion behavior of ceramics in aqueous solutions," 16th International Conference on Wear of Materials, Volume 263, Issues 1-6, 10 September 2007, pp. 295-300.

Niebuhr, D. "Metallurgical Failure Analysis of a Horse Trailer: A Criminal Investigation," *Journal of Failure Analysis and Prevention*, Volume 6 (4), August 2006. pp. 25-30.

Niebuhr, D. and M. Scholl, "Performance of Steel / Polymer Plasma Sprayed Coatings," *Journal of Thermal Spray Technology*, ASM International. Vol. 14 (4), December 2005. pp. 1-7.

Niebuhr, D. "Teaching Failure Analysis as an Independent Design Experience," *Proceedings of the ASEE Annual Conference*, Portland, OR, 2005.

Niebuhr, D., "Abrasive Wear as a Function of Microstructure in Metals," *Proceedings of the 19th Annual National Educators Workshop*, October 2004.

Niebuhr, D., "Cavitation / Erosion Wear as a Function of Microstructure in Metals," *Proceedings of the 19th Annual National Educators Workshop*, October 2004.

Niebuhr, D. and W.D. Forgeng, "Age Hardening of Aluminum Alloys," *Proceedings of the 19th Annual National Educators Workshop*, October 2004.

Niebuhr, D., Smith H., "Integrated Laboratories vs. Traditional Laboratories, Is there a difference?" *Proceedings of the ASEE Annual Conference*, Salt Lake City, CA, 2004.

Niebuhr, D. "Discovering the Source of Properties in Alloys: Metallographic Examination," *17th Annual National Educators Workshop*. 2002.

Li, M., Niebuhr, D., Atteridge, D., and Mekeesho, L. "A Computational Model for the Prediction of Steel Hardenability," *Metallurgical and Materials Transactions*, Vol. 29B. No. 3, June 1998.

Niebuhr, D., Scholl, M., and Clayton P. "Self-Lubricating Composite Plasma Sprayed Coatings," *Proceedings from the 9th National Thermal Spray Conference*, ASM International, 1996.

Li, M., Niebuhr, D, Atteridge, D., and Mekeesho, L. "Computing Jominy Hardness Curves of Steels," *Proceedings of the International Symposium on Phase Transformations during the Thermal/Mechanical Processing of Steel*, CIM, Montreal, 1995

Additional technical publications (75+) were developed but contain proprietary information and thus are not in the public domain

Professional Service & Affiliations

National Science Foundation Proposal Panel Reviewer

Metallurgical and Materials Transactions Reviewer

Materials Science A Reviewer

American Society of Metals (ASM)

National Eagle Scout Association Life Member