

Exponent®
Engineering & Scientific Consulting

Ross Bennett-Kennett, Ph.D., P.E.

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Professional Profile

Ross Bennett-Kennett, Ph.D., P.E., is a managing engineer in Exponent's Metallurgical & Corrosion Engineering practice with over five years of experience in protective coatings failure analysis, metallurgical failure analysis, and corrosion engineering. He specializes in coating adhesion and surface preparation disputes, fracture mechanics, and fatigue failure across construction, chemical processing, energy, and consumer products industries. He works with facility and equipment owners, contractors, manufacturers, insurers, and legal counsel as an engineering consultant and testifying expert witness.

Areas of Expertise:

- Protective Coatings Failure Analysis
- Metallurgical Failure Analysis
- Corrosion Engineering & Prevention
- Fracture Mechanics & Fatigue
- Materials Science & Characterization

Industries Served:

- Disputes & Litigation
- Construction & Building Envelope
- Electric Utilities & Transmission
- Water & Wastewater Infrastructure
- Oil, Gas & Liquefied Natural Gas (LNG)
- Chemical & Industrial Processing
- Power Generation
- Nuclear & Solar Power
- Data Centers
- Semiconductor Manufacturing
- Medical Devices & Biomaterials
- Consumer Products & Packaging
- Automotive & Aerospace

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Protective Coatings Failure Analysis

Dr. Bennett-Kennett holds all three levels of AMPP (formerly NACE) Certified Coating Inspector certification, the highest credential available in the coatings inspection field. He is also a voting member of AMPP Standards Committee 23, which governs coating system application, maintenance, and inspection.

Dr. Bennett-Kennett evaluates the performance and failure of protective coating systems across industrial and commercial applications, including tank liners for chemical and water storage, structural steel fireproofing and anti-corrosion coatings, building facades, galvanized and galvalume systems, and coil-coated products such as garage doors and metal roofing. His analyses address the full lifecycle of a coating system — from surface preparation and application through in-service degradation and failures such as paint peeling, cracking, and blistering, among others.

He has specific expertise in evaluating surface preparation methods — including abrasive blasting, hydroblasting, pickling, and scarification — and their effect on coating adhesion and long-term performance. He supports both pre-market product development, post-market product improvement, and failure analysis, including root-cause analyses, and support of litigation and international arbitration proceedings through preparation of expert reports and provision of expert testimony.

Metallurgical Failure Analysis

Dr. Bennett-Kennett conducts metallurgical failure analyses for clients in construction, manufacturing, consumer products, and industrial equipment sectors. His investigations apply fractography, optical and scanning electron microscopy (SEM), mechanical testing, and Fourier-transform infrared spectroscopy (FTIR) to identify the root cause of failures in ferrous and non-ferrous metals, ceramics, polymers, and wood. He advises manufacturers, insurers, and legal teams on whether failures resulted from design deficiencies, material aspects, processing-related issues, or in-service damage — providing technically rigorous, defensible conclusions.

Corrosion Engineering & Prevention

Dr. Bennett-Kennett advises clients on corrosion damage assessment, corrosion mitigation strategies, and the selection and performance of corrosion control systems. His corrosion work spans various forms of corrosion and rust damage, including electrochemical corrosion, galvanic corrosion, stress corrosion cracking (SCC), and environmentally assisted cracking in metallic systems. He has investigated corrosion failures in industrial infrastructure, building systems, and consumer products, and has presented research on corrosion mitigation in actuator design and cured-in-place pipe repair at AMPP annual conferences. Dr. Bennett-Kennett has served as an expert witness in corrosion-related construction litigation and contract disputes.

Fracture Mechanics & Fatigue

Dr. Bennett-Kennett applies fracture mechanics and fatigue analysis to investigate failures involving cyclic loading, overload fracture, stress corrosion cracking, and delamination. His work encompasses both metallic and non-metallic systems, including structural steels, aluminum alloys, ceramics, and polymeric materials. He evaluates crack initiation and propagation mechanisms, assesses the role of residual stress and stress concentrations, and provides clients with technically grounded assessments regarding the cause of failure.

Materials Science & Characterization

Dr. Bennett-Kennett brings a strong foundation in materials science and thin-film mechanics to his consulting practice, drawing on doctoral research at Stanford University focused on stress measurement

in thin-film systems under harsh environmental conditions. He is proficient in a broad range of materials characterization techniques — including mechanical testing, optical microscopy, SEM, energy-dispersive X-ray spectroscopy (EDS), and FTIR — and applies these tools to support failure analysis, product development, and litigation consulting across industries including construction, consumer products, energy, and medical devices.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, Stanford University, 2020

M.S., Materials Science and Engineering, University of California, Santa Barbara, 2015

B.S., Physics, Arizona State University, 2013

2025 Cosmetic Victories Academic Prize Finalist

National Science Foundation Graduate Research Fellowship Program Fellow, 2013-2016

Licenses and Certifications

Professional Engineer Metallurgical, Arizona, #86098

Professional Engineer Metallurgical, California, #2059

NACE - Certified Coating Inspector Level 1 Certification

NACE - Certified Coating Inspector Level 2 Certification

NACE - Certified Coating Inspector Level 3 Certification

Professional Affiliations

Association for Materials Protection and Performance – AMPP

Voting member – AMPP Standards Committee 23 – Coating System Application, Maintenance, and Inspection

Patents

N. Herbots, et. al. Methods for Wafer Bonding and for Nucleating Bonding Nanophases Using Wet and Steam Pressurization, US Patent filed October 31, 2011

N. Herbots, et. al. Molecular Film Containing Polymeric Mixture for Hydrophobic Implant Surfaces US Patent filed October 31, 2011

Publications

Google Scholar

Gupta C, Moll J, Bennett-Kennett R, Santos S. A case study on unique challenges related to cured-in-place pipe repair methods. Proceedings of AMPP 2026. AMPP 2026. Houston, Texas.

Brooke P, Bennett-Kennett R, Gupta C, et al. Failure of coatings on wood substrates due to surface preparation and application. J Fail. Anal. and Preven. 2024.

Brooke P, Bennett-Kennett R, Gupta C, et al. Failure of coatings on wood substrates due to surface preparation and application. J Fail. Anal. and Preven. 2024.

Bryan AY, Brandon Strong E, Kidambi S, Gilligan-Steinberg S, Bennett-Kennett R, Lee JY, ... Ma MR. Biomechanical analysis of the Ross procedure in an ex vivo left heart simulator. World Journal for Pediatric and Congenital Heart Surgery 2022; 13(2):166-174.

Hendrickx□Rodriguez S, Connetable S, Lynch B, Pace J, Bennett□Kennett R, Luengo GS, ... Potter A. From decoding the perception of tightness to a clinical proof of soothing effects derived from natural ingredients in a moisturizer. International Journal of Cosmetic Science 2022.

Titan AL, Fahy E, Chen K, Foster DS, Bennett-Kennett R, Dauskardt RH, ... Longaker MT.. Proceed with caution: mouse deep digit flexor tendon injury model. Plastic and Reconstructive Surgery Global Open 2021; 9(1).

Rolston N, Bennett-Kennett R, Schelhas LT, Luther JM, Christians JA, Berry JJ, Dauskardt RH. Comment on “Light-induced lattice expansion leads to high-efficiency perovskite solar cells”. Science 2020; 368(6488):eaay8691.

Wang H, Bennett-Kennett R, Paulsen MJ, Hironaka CE, Thakore AD, Farry JM, ... Woo YJ. Multiaxial lenticular stress-strain relationship of native myocardium is preserved by infarct-induced natural heart regeneration in neonatal mice. Scientific reports 2020; 10(1):1-12.

Mias C, Maret A, Gontier E, Carrasco C, Satge C, Bessou□Touya S, ... Duplan H. Protective properties of Avène Thermal Spring Water on biomechanical, ultrastructural and clinical parameters of human skin. Journal of the European Academy of Dermatology and Venereology 2020; 34:15-20.

Wang H, Bennett-Kennett R, Paulsen MJ, Hironaka CE, Thakore AD, Farry JM, ... Woo YJ. Neonatal heart regeneration preserves native ventricular biomechanical properties after myocardial infarction. Circulation Research 2019; 125(Suppl_1):A724-A724.

Davis E, Herbots N, Whaley S, Bennett-Kennett R, Culbertson R, Causey A, ... Wilkens B. Hermetic nano-bondingTM and surface characterization for medical implants and marine and air sensors. Bulletin of the American Physical Society 2014; 59.

Bennett-Kennett R, Herbots N, Murphy A, Sell D, Kutz T, Benitez S, ... Kwong H. Modeling condensation, hydro-and pepto-affinity of surfaces in medical implant devices and surgical lenses: effect of blood proteins. In APS Four Corners Section Meeting Abstracts 2012; J1-005.

Presentations

Gupta C, Moll J, Bennett-Kennett R, Santos S. A case study on unique challenges related to cured-in-place pipe repair methods. AMPP 2026, Houston, TX, 2026.

Bennett-Kennett R, Semenikhin N, Brooke P, Schoen D, Guyer E. Corrosion mitigation in actuator design. AMPP 2026, Houston, TX, 2026.

Semenikhin N, Brooke P, Bennett-Kennett R, Lemberg J. A comparative analysis of corrosion product removal methods for ferrous fracture surfaces. IMAT 2025, Detroit, MI, 2025.

Semenikhin N, Brooke P, Bennett-Kennett R, Lemberg J, Dodaran M, Molnar J. Abnormal failures of table knives during operation. IMAT 2025, Detroit, MI, 2025.

Bennett-Kennett R, Gupta C, Guyer EP. Best practices for root cause analysis in the context of a potential dispute. AMPP Eastern Conference, Grand Rapids, Michigan, 2024.

Brooke PD, Semenikhin N, Bennett-Kennett R, Guyer EP. Pitfalls of using EDS in failure analysis. International Materials, Applications & Technologies Conference, Cleveland, Ohio, 2024.

Project Experience

The projects below reflect the failure questions clients bring to Dr. Bennett-Kennett, from why paint or a protective coating peeled, blistered, or delaminated to why equipment corroded, cracked, or failed early. In disputes, he prepares expert reports, gives deposition testimony, testifies at hearings, and supports trials, arbitration hearings, and mediations. He also consults directly for industry teams on product development, asset integrity management, and failure analysis, helping engineering and operations groups prevent failures before they become disputes.

Expert Witness and Dispute Experience

- **Municipal Water Reservoir, Abrasive Blasting and Surface Preparation Dispute**. Advised a client in a high-stakes Ontario Dispute Adjudication for Construction Contracts (ODACC) proceeding, the fast 30-day Ontario process for resolving construction disputes. Dr. Bennett-Kennett evaluated the blasting and surface preparation operations on the renovation of a large municipal water reservoir, provided expert testimony, and was cross-examined. Dr. Bennett-Kennett's work enabled a successful outcome for the client.

- **Steel Joist Primer Delamination and Paint Failure**. Advised counsel in a construction dispute centered on delamination failures of a shop-applied primer from steel joists. Dr. Bennett-Kennett investigated the surface preparation and the resulting coating failure and performed a coatings failure analysis. He also provided several Rule 26(a)(2) expert reports with affirmative and rebuttal opinions.

- **Engineered Wood Flooring Coating Failure**. Advised counsel in a dispute over a failed wood flooring coating, where the key question was why the factory-applied topcoat on engineered wood flooring was peeling prematurely. Dr. Bennett-Kennett served as the testifying expert and issued a Rule 26(a)(2) expert report.

- **Concrete Floor Surface Preparation and Paint Spill Remediation**. Advised counsel in a dispute over the cleanup of a paint spill on a concrete floor providing expert guidance on appropriate surface preparation and remediation methods. Dr. Bennett-Kennett provided a Rule 26(a)(2) report and deposition testimony on those methods.

- **Galvanized Steel Premature Corrosion and Failure**. Supported a steel construction contractor that needed to understand why galvanized structural steel degraded prematurely and whether

shipping and storage conditions were to blame. Dr. Bennett-Kennett evaluated the premature rusting of the steel and supported the client at an international arbitration hearing.

- **Ductile Iron Water Pipe Repair Dispute**. Advised counsel in a dispute over failed pipe-bursting operations as part of a repair-in-place application. Dr. Bennett-Kennett provided an expert opinion on the repair of ductile iron water pipe and served as the testifying expert.

- **Chemical Shipping Vessel Tank Lining Failure**. Supported a client experiencing protective tank lining systems failures in chemical shipping vessels. Dr. Bennett-Kennett assessed the coating condition and its adhesion under chemical exposure to determine the failure mechanisms. He also supported the client at an international arbitration hearing.

- **Metal Roofing and Garage Door Coil Coating Failures**. Consulted for clients with industrial and architectural coil-coated roofing and garage-door products that corroded prematurely and mottled. Dr. Bennett-Kennett evaluated the failures and provided expert testimony in the arbitration.

Protective Coatings, Linings and Surface Preparation

- **Water and Wastewater Infrastructure Coating Failures**. Consulted for clients responsible for municipal water infrastructure who required expertise regarding asphaltic coatings on concrete and ductile iron water pipe. Dr. Bennett-Kennett analyzed the failures and evaluated how the protective coatings performed in service.

- **Anaerobic Digester Tank Lining Failure**. Investigated for an agricultural client that experienced premature failure of the protective lining inside its anaerobic digestion tank. Dr. Bennett-Kennett investigated the lining failure and identified why it occurred.

- **Food and Beverage Process Tank Coating Failure**. Advised a food and beverage client that needed to know why a coating failed inside an orange juice storage tank. Dr. Bennett-Kennett evaluated the coating degradation and the surface preparation that preceded it.

- **Intumescent and Fireproofing Coating Failures**. Consulted for owners and contractors at energy and industrial facilities, including an LNG facility, who experienced intumescent coating and fireproofing delamination and cracking. Dr. Bennett-Kennett investigated the failures.

- **Architectural Exterior Paint and Coating Failure**. Consulted for a client on the failure of the exterior coating on a university building. Dr. Bennett-Kennett investigated the application-related

failure and helped the client develop remediation approaches. The client avoided legal proceedings after successful remediation of the facade issues.

- **Structural Concrete Coating Failures at Semiconductor Facility**. Consulted for a client constructing a large semiconductor fabrication facility on paint and protective coating failures on structural concrete waffle slabs. Dr. Bennett-Kennett investigated the failures during construction.

Corrosion and Infrastructure

- **Data Center Electrical Equipment Corrosion**. Advised a data center client on corrosion and insulation degradation affecting electrical equipment at large data centers. Dr. Bennett-Kennett evaluated the switchgear, current transformers, and electrical connections.

- **Water and Gas Service Piping Corrosion**. Assessed claims by utility customers of property damage and appliance failures to determine whether corroded piping was the cause. Dr. Bennett-Kennett investigated corrosion of water-service piping and neighboring gas piping on behalf of the water utility.

- **Microbiologically Influenced Corrosion**. Advised an oil-field client on whether microbiologically influenced corrosion (MIC) was affecting its piping. Dr. Bennett-Kennett evaluated the potential for MIC in oil-field piping.

- **Aircraft and Aerospace Corrosion**. Advised insurers and the insured on the cause of corrosion on aerospace components. Dr. Bennett-Kennett investigated corrosion of aluminum aircraft skin following paint stripping and evaluated the storage-related corrosion risk to aircraft turbine components to assist the insured and insurers in reaching a resolution.

Industrial, Energy and Process Equipment

- **Nuclear Power Plant Material Delamination**. Consulted for a nuclear power facility operator on why insulating materials cracked and peeled from electrical bus bars. Dr. Bennett-Kennett investigated the delamination and provided mediation support.

- **Thermal Spray Equipment Explosion**. Supported a client affected by an industrial explosion in determining how the thermal spray equipment involved had failed. Dr. Bennett-Kennett evaluated the equipment failure.

- **Chemical Processing Vessel Explosion**. Assisted a client dealing with an explosion involving chemical process equipment that required proper evidence handling and an explanation of the

failure. Dr. Bennett-Kennett supported evidence collection and preservation, characterized the materials, and analyzed the failure.

- **LNG and Chemical Facilities**. Advised operators of liquefied natural gas and chemical-processing facilities on root causes for equipment problems. Dr. Bennett-Kennett investigated impeller and compressor failures, valve failures, and coating and corrosion problems.

- **Paper Mill Equipment Failure**. Consulted for a paper mill operator on why its industrial winding equipment failed to meet throughput demands. Dr. Bennett-Kennett conducted vibration and component failure analysis through thorough review of maintenance records.

- **Electrical Transmission Tower Coating Failure**. Advised an electrical utility on the premature failure of the coating on its electrical transmission towers. Dr. Bennett-Kennett investigated through field assessment, laboratory analysis, coating re-creation testing, and remediation testing. He also supported utility clients with programs for evaluating coating and corrosion conditions across their infrastructure assets.

- **Solar Tracker Water Ingress and Corrosion**. Supported a solar client in determining why components of utility-scale solar trackers were failing. Dr. Bennett-Kennett investigated failures associated with water ingress and corrosion.

Materials and Product Failure Analysis

- **Automotive Paint Failure and Corrosion Claims**. Advised automotive clients facing claims of paint failure and corrosion on vehicles. Dr. Bennett-Kennett investigated paint delamination, seam corrosion, brake-booster corrosion, regional vehicle paint damage, and corrosion-related class-action claims through inspections, destructive analysis, and laboratory testing and supported depositions.

- **Beverage and Food Can Liner Failures**. Consulted for packaging clients on why food and beverage containers failed. Dr. Bennett-Kennett investigated can liner defects, corrosion, leakage, shipping and storage exposure, and unintended perforation.

- **Glass and Building Facade Failures**. Advised parties to building-envelope disputes on why glass and glazing failed. Dr. Bennett-Kennett investigated laminated-glass cracking and delamination, moisture ingress in insulating glass units, and degradation of low-emissivity coatings.

- **Medical Device and Biomaterial Failure Analysis**. Consulted for several medical device clients on why devices and components failed and assisted them in developing new manufacturing methods to reduce failures. Dr. Bennett-Kennett performed failure analysis involving corrosion, fracture,

contamination, coatings, polymers, nitinol wires, endoscope components, implants, and sensor assemblies.

- **Fracture and Metallurgical Failure Analysis**. Advised clients with a wide assortment of broken metallic components on the root cause. Dr. Bennett-Kennett determined why bolts, bearings, wire ropes, tie rods, wheel rims, engine components, HVAC piping, and other parts failed, including fatigue, overload, embrittlement, corrosion, and manufacturing-related failure mechanisms.

Editorships & Editorial Review Boards

Volume Editor, ASM Handbook, Volume 11C: Coating Failure Analysis, ASM International – in progress