

Larry D. Hanke, P.E.

Metallurgical Engineer

Materials Evaluation and Engineering, Inc.

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SUMMARY

Metallurgical engineer with over 35 years of experience in failure analysis, materials characterization, product evaluation, and research and development. Expert in engineering evaluation of failures in metallic and nonmetallic materials by deformation, fracture, corrosion, and wear. Skilled with a wide variety of materials evaluation laboratory methods and instruments. Experienced as an expert witness for product-liability litigation.

EDUCATION AND PROFESSIONAL CERTIFICATIONS

Bachelor of Science, Metallurgical Engineering, 1978

Iowa State University, Ames, Iowa

Registered Professional Metallurgical Engineer (Licensed in Minnesota, Wisconsin and California)

EXPERIENCE

December 1994 to Present

Materials Evaluation and Engineering, Inc.

Plymouth, MN

Principal Engineer

- Perform product failure analyses for a diverse industrial clientele and to support insurance investigations and product-liability litigation. Areas of expertise include fracture, deformation, wear, corrosion, and environmental degradation in metals and polymers.
- Perform materials engineering evaluations and materials characterization for new product development and product improvement projects for high-technology industrial clients.
- Assist high-technology industrial clients with materials selection and processing optimization.
- Design and perform specialized testing to evaluate product performance and simulate failure mechanisms.
- Provide expert witness testimony in the areas of materials science and failure analysis.

June 1991 to December 1994

Engel Metallurgical
St. Cloud, MN
Metallurgical Engineer

- Performed failure analysis for a wide variety of industrial and private clientele, including support for product-liability litigation.
- Consulted with industrial clients on materials selection and applications.
- Provided technical services to industry to solve materials-related manufacturing problems.
- Performed and directed materials evaluation testing, including microstructure evaluations, fractographic examinations, and physical and mechanical properties testing.

May 1986 to May 1991

Anamet Laboratories, Inc.
Hayward, CA
Senior Metallurgist

- Performed failure analyses for a wide range of engineering systems and consumer products, encompassing structural, corrosion, and tribological failures.
- Served as an expert witness in metallurgy and failure analysis for product-liability litigation.
- Principal investigator for a research project to design a new, computerized system for quantitative evaluation of surface defects in rolling-element bearings.
- Assisted in research projects investigating the use of fractals to predict soil properties and evaluating fracture propagation in engineered structural polymers.
- Developed equipment and techniques for specialized mechanical and corrosion testing for material and product evaluations.
- Directed and performed routine material tests based on ASTM, ASME, Federal, Military, and other industry standards and specifications.

August 1978 to May 1986

Anamet Laboratories, Inc.
Berkeley, CA
Metallurgist

- Conducted failure analyses for industrial clients and to support product-liability litigation.
- Performed routine materials testing, materials characterization analyses, and specialized product evaluations.
- Provided metallurgical consulting on materials and process selections for a wide variety of industrial clients.
- Participated in research projects related to the development of new, improved tool steel alloys.

August 1992 to May 1993

St. Cloud State University
St. Cloud, MN
Adjunct Professor

- Taught introductory materials engineering course to undergraduate students in Manufacturing Engineering. Materials covered included: metals, polymers, and ceramics.
- Developed and taught laboratory course accompanying undergraduate materials engineering course.

AWARDS AND RECOGNITION

- Fellow of ASM International 2010

PROFESSIONAL AFFILIATIONS

- ASM International Member 1975 - present
 - Golden Gate Chapter Chairman 1991 - 91
 - Minnesota ASM Chapter Chairman 2000 - 01

- ASM International Handbook Committee Member 1996 - 2013
 - Vice Chairman 2004 - 2006
 - Chairman 2006 - 2008

- ASM International Failure Analysis Committee Member 1998 - 2013
 - Secretary 2009 - 2010
 - Vice Chairman 2010 - 2011
 - Chairman 2011 - 2012

- ASM International Technical Books Committee Member 2009 - present

- Minnesota Microscopy Society Member 1996 - present
 - Vice Chairman 2012 - 2013
 - Chairman 2013 - 2014

- International Organization on Shape Memory and Superelastic Technologies Member

- International Metallographic Society Member

- ASTM International Member
 - Member ASTM Committees on Forensic Sciences and Forensic Engineering

- American Welding Society Member

- National Association of Corrosion Engineers Member

- Society of Plastics Engineers Member

PUBLICATIONS

BOOKS

- Hanke, Larry D., "Wear Failures - Fatigue," *Understanding How Components Fail*, Third Edition, Edited by Brett Miller, ASM International, pp 189 - 209, 2013 (Chapter reviewed and revised from *Understanding How Components Fail*," Second Edition by Donald Wulpi, 1999)
- Hanke, Larry D., "Surface Characterization for Medical Devices", *ASM Handbook Volume23, - Materials for Medical Devices*, pp 331-342, 2012
- Chumbly, L. S., Hanke, L. D., "Scanning Electron Microscopy", *ASM Handbook Volume11 - Failure Analysis and Prevention*, 516-526, 2002

PROCEEDINGS AND JOURNALS

- Hanke, Larry D., "Variable Pressure Scanning Electron Microscopy for Nonconductive and Volatile Samples," *Microscopy Today*, Issue 95-9, November 1995, Pages 20-21
- Hanke, Larry D. and Smith, Gary, "Electron Microscopy of Ni-Ti Alloys for Medical Devices," *Microscopy and Microanalysis* 96, 1996
- Hanke, Larry D. and Schenk, Kurt, "Sputter Etching for Microstructure Evaluation of Small Diameter Corrosion Resistant MP35N Wire," *Microscopy and Microanalysis* 96, 1996
- Hanke, Larry D. and Smith, Gary, "Electron Microscopy Ni-Ti Alloys for Medical Devices," *American Laboratories*, June 1997
- Rodnyansky, A., Warburton, Y. J., Hanke, L. D., "Segregation in Hot-dipped Galvanized Steel", *Surface and Interface Analysis*, 29, 215-220, March 2000
- Hanke, L and Bayha, E., "Surface Characterization for Optimizing Electropolishing for Medical Devices," *Medical Device Materials - Proceedings of the Materials and Processes for Medical Devices Conference*, 81-86, 2004
- Hanke, L and Schenk, K., "Characterization of Secondary Phases in Nitinol," *Proceedings of the International Conference on Shape Memory and Superelastic Technologies*, 164-165, 2010
- Haase, Ryan J. and Hanke, Larry D., "Boiler Stack Economizer Tube Failure," *Journal of Failure Analysis and Prevention*, Volume 13, Issue 5 (2013), pp 513-520

RECENT DEPOSITION AND TRIAL EXPERIENCE

- Water Connector Valve Failure, Terra Springs Master Association v. Accor Technologies, 2010 Deposition, 2011 Trial
- Ford Speed Control Deactivation Switch Failure, Kenneth Rausch v. Ford Motor Co., State of Minnesota, District Court, Stearns County, 2010 Deposition, 2011 Trial
- Brass Compression Fitting Failure, Kraft Foods v. Sentry Fire Protection, Inc.; Proform Construction, Inc.; The Viking Corporation; and Arctic Cold Storage, Inc., State of Minnesota, District Court, Seventh Judicial District, Stearns County, 2011 Deposition
- Grain Trailer Side Rail Fracture, Randy Hemmer v. ANPAC, State of South Dakota Circuit Court, Third Judicial Circuit, Moody County, 2011 Trial
- Mine Drill Collapse, Atlas Copco Drilling Solutions v. United Taconite, Standard Hardware, Minnesota 6th Judicial District Court, St Louis County, 2011 Trial
- Nuvex Ingredients Plant Fire Artifact Examination, Kerry Holding Co. v. Phillips Lighting, et al, Minnesota District Court, Fifth District, Faribault County, 2011 Deposition
- House Fire Wiring, State Farm Casualty/Michael and Terry Wickman v. Continental Insurance/Steven Kassner Construction et al, Wisconsin Circuit Court, Brown County, 2012 Deposition
- Heat Exchanger Failure, Venice Energy Services v. Industrial Heat Transfer and SME Associates, District Court, Harris County, Texas 133rd Judicial District, 2012 Deposition
- Case IH Combine Fire, Northstar Mutual Insurance/Kylan Meier v. CNH America and Titan Machinery, United States District Court, South Dakota, Southern District, 2012 Deposition
- Copper Propane Supply Leak, Hal Nelson v. Southeast Propane, LLC, North Dakota District Court, North Dakota, Southeastern Judicial District, County of Sargent, 2013 Deposition
- Pry Bar Fracture, Jason Martin v. Apex Tool Group, LLC, United States District Court, Northern District of Iowa, Central Division, 2013 Deposition
- Residential Fire - Freezer Examination, Allstate Insurance v. Electrolux Home Products, Inc., State of Wyoming, Sheridan County, District Court, Fourth Judicial District, 2013 Deposition

- Water Softener Bypass Valve Failure, Guide One Insurance/South Coast Christian Assembly v Ecowater Systems LLC, US District Court, Central District of California, 2013 Deposition, 2014 Trial
- Residential Fire - Propane Tank Examination, State Farm Insurance/Plumwood Condominiums, et al v. Mecor Corporation, United States District Court, Southern District of Iowa, Central Division, 2013 Deposition
- Boiler Failure Evaluation, E3 Biofuels, LLC v. Biothane LLC, Perennial Energy, United States District Court, District of Nebraska, 2013 Deposition
- Gas Supply Leak, Karen Sue Knox/Jerry Michael Roberts v Southern States Cooperative et al, Commonwealth of Kentucky, Powell District Court, Division 1, 2014 Deposition
- Gas Supply Connector Failure, Shigeko Brooks, Estate of Marvin Engler and Sentry Insurance, Travelers Ins v. Wisconsin Gas LLC et al, State Of Wisconsin, Circuit Court, Milwaukee County, 2014 Deposition
- Ladder Collapse Investigation, Melvin Austin v. Louisville Ladder, Inc, United States District Court, Southeast District of Iowa, Eastern Division, 2014 Deposition
- Elevator Explosion Investigation, All Points Cooperative and Nationwide Insurance Company v. Frisbie Construction et al, District Court of Douglas County, Nebraska, 2014 Deposition
- House Explosion Investigation, Neva v. Country Comfort et al, State of Wisconsin, Circuit Court, Barron County, 2014 Deposition