

Shari Nathanson Rosenbloom, Ph.D.
Manager

Professional Profile

Dr. Shari Nathanson Rosenbloom is a Manager in Exponent's Mechanical Engineering and Materials/Metallurgy practice. Dr. Rosenbloom's expertise is in metallurgical engineering and electrochemical testing of medical devices. Dr. Rosenbloom conducts failure analysis investigations in order to determine the cause of failure in a variety of industrial settings, as well as for biomedical applications. She has developed expertise in analyzing a broad range of corrosion mechanisms (e.g., stress corrosion cracking, formicary corrosion, galvanic corrosion, underdeposit corrosion, pitting, erosion corrosion, cavitation, and general corrosion), as well mechanical failures (e.g., fatigue, overload, wear, and failure due to manufacturing defects). Her work has focused on the failure modes of a number of metallic materials including steels, copper and copper-based alloys, aluminum alloys, and nickel-based alloys. She consults in a variety of industries including HVAC, petrochemical processing and refining, food handling, pharmaceutical, biomedical implant devices, and chemical processing.

Dr. Rosenbloom also consults on the topic of biocompatibility of medical implants with regard to their corrosion resistance in the body. She has extensive experience in assessing resistance to pitting corrosion per ASTM F 2129, galvanic corrosion per ASTM G 71, metal ion leaching in long-term corrosion tests, as well as in designing customized testing protocols. She has developed expertise in the corrosion behavior of a broad range of implant materials such as stainless steel, nitinol, titanium alloys, and cobalt-chromium based alloys. Dr. Rosenbloom also has experience in conducting risk assessments and evaluating potential release of material into the body from corroding or potentially corroding devices.

Dr. Rosenbloom participated in identifying corrosion research grand challenges and in developing a national strategy for fundamental corrosion research while serving on an expert panel for the National Academy of Sciences/National Research Council.

Dr. Rosenbloom has experience testifying at deposition and serving as an expert witness.

Prior to joining Exponent, Dr. Rosenbloom was the Principal Metallurgical Engineer for Corrosion Testing Laboratories, Inc. in Newark, Delaware.

Academic Credentials and Professional Honors

Ph.D., Materials Science and Engineering, University of Pennsylvania, 1990
B.S.E., Bioengineering, University of Pennsylvania, 1984

Ashton Fellowship, 1984–1990
Bioengineering Senior Design Award, 1984
Dean's List, 1983–1984

Publications and Presentations

James BA, McVeigh C, Rosenbloom SN, Guyer EP, Lieberman C. Ultrasonic cleaning induced failures in medical devices. Presented at Materials and Processes for Medical Devices Conference and Exposition, Minneapolis, MN, August 10–12, 2009.

Rosenbloom SN, Pound, BG. Corrosion of medical implants. Invited seminar, United States Food and Drug Administration, Rockville, MD, 2009.

Rosenbloom S. Watertube boiler failure analysis—Case histories. Invited speaker in TEG 163X, Boiler Waterside Failure Analysis, at NACE 2009, Atlanta, GA, 2009.

Rosenbloom SN, Kus E. Corrosion testing of medical devices, AudioConference, Thompson Publishing Group, Inc., 2008.

Rosenbloom SN. Corrosion testing of nitinol implants per ASTM F 2129—Understanding corrosion and interpretation of test results. Presented at and published in the Proceedings of the Materials and Processes for Medical Devices Conference and Exposition, Palm Desert, CA, September 23–25, 2007.

Rosenbloom SN, Corbett RA. An assessment of ASTM F 2129 test results comparing nitinol to other implant alloys. Presented at and published in the Proceedings of the International Conference on Shape Memory and Superelastic Technologies (SMST), Pacific Grove, CA, May 7–11, 2006.

Rosenbloom SN. An acceptance criterion for F 2129: Is it possible? Results for nitinol devices with varied processing conditions. Invited presentation at the Workshop on Corrosion of Medical Implants, ASTM Committee Week, Norfolk VA, May 2007.

Rosenbloom SN, Corbett RA. An assessment of ASTM F 2129 electrochemical testing of small medical implants—Lessons learned. Presented at and published in the Proceedings of NACE Corrosion 2007, Nashville, TN, 2007.

Rosenbloom SN, Laird C. Fatigue crack nucleation based on a random slip process – I. Computer model. *Acta Metall Mater* 1993; 41:3473–3482.

Rosenbloom SN, Laird C. A computer model of fatigue crack nucleation based on a random slip process. Presented at the Fatigue Crack Initiation Symposium at the ASM/TMS Materials Exposition, Pittsburgh, PA, October 19, 1993.

Prior Experience

Principal Metallurgical Engineer, Corrosion Testing Laboratories, Inc., 2004–2007

Consultant, University of Pennsylvania, Department of Materials Science Engineering, 1985–1990, 1993

Consultant, DuPont Marshall Laboratory, 1988

Research Assistant, Temple University Hospital, Department of Cardio-Thoracic Surgery, 1983–1985

Peer Reviewer

- Acta Biomaterialia, 2009
- National Academy of Sciences/National Research Council, “Review of the Bureau of Reclamation’s Corrosion Prevention Standards for Ductile Iron Pipe,” 2008

Academic Experience

- Guest Lecturer, Princeton University, “Corrosion of Biomaterials”, in MAE 344 (Introduction to Bioengineering and Biomedical Devices), Department of Mechanical and Aerospace Engineering, Spring 2009.

Professional Affiliations

- National Academy of Sciences/National Research Council, “Research Opportunities in Corrosion Science and Engineering,” Committee Member, 2008–2009
- National Association of Corrosion Engineers—NACE International
- ASM International, Liberty Bell Chapter, Committee Chairperson
- ASTM International, Member of F04 Committee on Medical and Surgical Materials and Devices, Member of G01 Committee on Corrosion of Metals
- The Minerals, Metals & Materials Society—TMS
- Professional Women’s Roundtable