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Engineering & Scientific Consulting

Maureen Reitman, Sc.D., P.E., NAE, FSPE

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Professional Profile

Dr. Reitman leverages her understanding of the fundamental principles of materials science and the technology of macromolecules to assess risk and performance for end users, distributors, manufacturers, product designers and raw material suppliers across a wide range of industries. Her expertise includes polymer and composite technology, mechanics of materials, adhesion science, fiber mechanics, history and technology of plastics, and material failure analysis.

Dr. Reitman is skilled in the development and use of testing tools and methods and has applied them to plastics, rubber, textile, metal, glass, ceramic, and composite materials and systems. She is experienced in major aspects of product development, including materials selection, formulation, scale-up, end-use testing, failure analysis, certification procedures and issues related to intellectual property.

Dr. Reitman has conducted research in the areas of medical plastics and devices including implants, diagnostic components, and transdermal drug delivery systems; plastic packaging and barrier materials; paints and coatings; plastic pipes; spray foam insulation; adhesives, sealants, and encapsulants; additive manufacturing / 3D printing; molding compounds; composite materials; high temperature resins; rubber gaskets and seals; nanoparticles; fibers and textiles; polymer chemical resistance; wire and cable insulation; connectors and splices; environmental effects on durability; and product aging.

She has used her expertise to address problems and opportunities related to coatings, fibers, films, and extruded and molded products, and their use in the telecom, electronics, electrical, energy, transportation, construction, fire protection, medical, and consumer products markets. Dr. Reitman also assists clients with matters related to intellectual property, including support related to patent filings, technical due diligence, and technical aspects of trade secret, patent infringement, and patent validity disputes.

Dr. Reitman is active in technical and business advisory roles. She has served on technical advisory boards for materials and manufacturing companies as well as in several Board of Directors positions for the Medical Plastics Division and the Failure Analysis and Prevention Special Interest Group of the Society of Plastics Engineers. Dr. Reitman is also a voting member of two Underwriters Laboratories Standard Technical Panels, addressing Polymeric Materials (UL 94, UL 746, UL 1694) and Appliance Wiring (UL758).

Prior to joining Exponent, Dr. Reitman worked for the 3M Company in both research and management roles. Her activities included technology identification, materials selection and qualification, product development, customer support, program management, acquisition integration, staff and organizational development, intellectual property analysis, and patent litigation support.

Academic Credentials & Professional Honors

Sc.D., Materials Science and Engineering, Massachusetts Institute of Technology (MIT), 1993

B.S., Materials Science and Engineering, Massachusetts Institute of Technology (MIT), 1990

Fellow of the Society of Plastics Engineers

National Academy of Engineering Frontiers of Engineering, 2009

Tau Beta Pi

Sigma Xi

John Wulff Award

Carl Loeb Fellowship

NCAA Postgraduate Scholarship

Malcolm G. Kispert Award

GTE Academic All-American

Licenses and Certifications

Professional Engineer, Maryland, #46268

Professional Affiliations

American Association for the Advancement of Science (member)

American Association of Textile Chemists and Colorists—AATCC (senior member)

American Chemical Society (member)

ASTM International (member)

Society for the Advancement of Material and Process Engineering (member)

Society of Plastics Engineers (Fellow)

Professional Appointments

Underwriter's Laboratory Standards Technical Panel STP 746 (Polymeric Materials, includes UL94, UL 746 and UL1694)

Underwriter's Laboratory Standards Technical Panel STP 758 (Appliance Wires/ UL758)

Medical Plastics Division Board of Directors, Society of Plastics Engineers

Failure Analysis and Prevention Special Interest Group Board of Directors, Society of Plastics Engineers

Patents

Patent 6,311,524: Accelerated Method for Increasing the Photosensitivity of a Glassy Material, issued November 6, 2001.

European Patent EP0830428: Tackified Polydiorganosiloxane Polyurea Segmented Copolymers and a Process for Making Same, published March 25, 1998.

Patent 5,731,051: Fiber Optic Fusion Splice Protector Sleeve, issued March 24, 1998.

Publications

Garcia-Leiner, M., Reitman, M. T.F., El-Hibri, M. J. and Roeder, R. K. (2016), Structure-property relationships in commercial polyetheretherketone resins. Polym Eng Sci. doi:10.1002/pen.24472.

Farina, R., Reitman M. The effect of localized heating on polyethylene tubing. Proceedings, ANTEC 2015, Society of Plastic Engineers, Orlando, FL, March 2015.

Moalli P, Brown B, Reitman MTF, Nager C. Polypropylene mesh: Evidence for lack of carcinogenicity. International Urogynecology Journal 2014; 25(5):573-576.

Hoffman JM, Ralston B, Chakravartula A, Reitman M. ESC of polycarbonate exposed to hospital disinfectants. Proceedings, ANTEC 2013, Society of Plastic Engineers, Cincinnati, OH, April 2013.

Ralston B, Hoffman JM, Reitman M. Fractographic examination of failures in polycarbonate and polyxymethylene due to impact, tensile, fatigue, and creep mechanisms. Proceedings, ANTEC 2013, Society of Plastic Engineers, Cincinnati, OH, April 2013.

Kurtz S, Siskey R, Reitman M. Accelerated aging, natural aging, and small punch testing of gamma-air sterilized polycarbonate urethane acetabular components. Journal of Biomedical Materials Research Part B: Applied Biomaterials 2010 May; 93B(2):422-447.

Hoffman JM, Reitman M, Donthu S, Ledwith P. Complimentary failure analysis methods and their application to CPVC pipe. Proceedings, ANTEC 2010, Society of Plastics Engineers, Orlando, FL, May 2010.

Hoffman JM, Reitman M, Donthu S, Ledwith P, Wills D. Microscopic characterization of CPVC failure modes. Proceedings, ANTEC 2009, Society of Plastics Engineers, Chicago, IL, June 2009. Best Paper Award in Failure Analysis & Prevention.

Kurtz SM, Ebert M, Siskey R, Ciccarelli L, Reitman M, Harper ML, Chan FW. Natural and accelerated aging of polyurethanes in the Bryan cervical disc. Poster No. P158. Transactions of Spineweek 2008, Geneva, Switzerland, May 26-31, 2008.

Reitman M, Ledwith P, Hoffman M, Moalli J, Xu T. Environmentally driven changes in nylon. Proceedings, ANTEC 2008, Milwaukee, WI, Society of Plastics Engineers, May 2008.

Hoffman JM, Reitman M, Ledwith P. Characterization of manufacturing defects in medical balloons. Proceedings, ANTEC 2008, Milwaukee, WI, Society of Plastics Engineers, May 2008.

Moalli JE, Moore CD, Robertson C, Reitman MTF. Failure analysis of nitrile radiant heating tubing. Proceedings, ANTEC 2006, Society of Plastic Engineers, Charlotte, NC, May 2006.

Reitman M, McPeak J. Protective coatings for implantable medical devices. Proceedings, ANTEC 2005, Society of Plastic Engineers, Boston MA, May 2005.

McPeak J, Reitman M, Moalli J. Determination of in-service exposure temperature of thermoformed PVC via TMA. Proceedings, 31st Annual North American Thermal Analysis Society Conference, Williamsburg, VA, 2004.

Reitman MTF, Moalli JE. Product development and standards organizations: Listings and certifications for plastic products. 8th Annual International Conference on Industrial Engineering Theory, Applications and Practice, Las Vegas, NV, 2003.

Potdar YK, Reitman MTF. The role of engineering consultants in failure analysis and product development. 8th Annual International Conference on Industrial Engineering Theory, Applications and Practice, Las Vegas, NV, 2003.

Ezekoye OA, Lowman CD, Hulme-Lowe AG, Fahey MT. Polymer weld strength predictions using a thermal and polymer chain diffusion analysis. Polymer Engineering and Science 1998; 38(6):976-991, June.

Fahey MT. Nonlinear and anisotropic properties of high performance fibers. MIT Thesis, 1993.

Fahey MT. Mechanical property characterization and enhancement of rigid rod polymer fibers. MIT Thesis, 1990.

Book Contributions

Reitman, M. T. F., Dimitriou, M. D., Vargas, J. R., & Madden, S. B. (2020). Why is service life prediction of polymers and plastics exposed to outdoor weathering important? An industrial perspective. In C. C. White, M. E. Nichols, & J. E. Pickett (Eds.), Service Life Prediction of Polymers and Coatings (pp. 19-32). William Andrew Publishing. https://doi.org/10.1016/B978-0-12-818367-0.00002-3

Reitman M, Jaekel D, Siskey R, Kurtz S. (2019) Morphology and crystalline architecture of polyarylketones, In: PEEK Biomaterials Handbook, Second Edition. Kurtz SM (ed), Elsevier William Andrews, Kidlington, Oxford, UK, 2019. ISBN 978-0-12-812524-3

Reitman M, Liu D, Rehkopf J. Chapter 38. Mechanical properties of polymers. In: Handbook of Measurement in Science and Engineering. Volume 2. Kutz, M (ed), John Wiley & Sons, Hoboken NJ, 2013. ISBN- 978-1-118-38464-0.

Reitman M, Jaekel D, Siskey R, Kurtz S. Morphology and crystalline architecture of polyarylketones, pp. 49-60. In: PEEK Biomaterials Handbook. Kurtz SM (ed), Elsevier William Andrews, Kidlington, Oxford, UK, 2012. ISBN 13:978-1-4377-4463-7

Tsuji JS, Mowat FS, Donthu S, Reitman M. Application of toxicology studies in assessing the health risks of nanomaterials in consumer products, pp. 543-580. In: Nanotoxicity: From In Vivo and In Vitro Models to Health Risks. Sahu S, and Casciano D. (eds), John Wiley & Sons, Chicester, West Sussex, UK, 2009. ISBN 978-0-470-74137-5.

Reitman MTF. The Plastics Revolution. In: Research and Discovery: Landmarks and Pioneers in American Science. Lawson RM (ed), Armonk NY: Sharpe Reference 2008. ISBN 978-0-7656-8073-0.

Klein SM. Mid-century plastic jewelry. Schiffer Publishing, Atglen, PA, 2005. (Technical advisor to author).

Trade Articles

Comerford PJ, Reitman MTF, Cooner, DJ. The legal issues of the 3DP/AM revolution. RX for the Defense 2014 Jan; 22(1).

Comerford PJ, Vernon DV, Reitman, MTF. 3DP/AM revolution is also a legal revolution.

(http://www.manufacturing.net/articles/) December 2013.

Comerford, PJ and Reitman, MTF. The 3DP/ AM revolution. Today's Medical Developments (cover story) (www.todaysmedicaldevelopments.com), October 2013.

Reitman, MTF, Moalli JE. Polymeric coatings for medical device. Medical Device and Manufacturing Technology, Touch Briefings 2006; pp. 28-30.

Selected Invited Presentations

Reitman, M. Improving Outcomes for Patients and Societies. Keynote Speaker, Medical Plastics Minitec, Society of Plastic Engineers, Anaheim, CA February 2020.

Wade, RJ, Kiel J, Reitman MTF. Oxidative stability of polypropylene for biomedical applications. 257th American Chemical Society Meeting. Orlando April 2019.

Reitman MTF. Service Life and Practical Risk: Incorporating failure modes and predictive tools in product development. NIST/ UL Conference on Service Life Prediction of Polymeric Materials: Reaching New Heights. Boulder, CO March 2018.

Reitman MTF. Innovate from what you know: Tips and tricks for medical device development. Teel Medical Plastics Summit, Minneapolis MN, November 2017.

Reitman MTF. Characteristics and Stability of Implantable Polypropylene Fibers. Medical Plastics Minitec, Society of Plastics Engineers, Durham, NC, April 2016.

Reitman MTF. 3D Printing technology viewed from the inside: Recognizing opportunity and managing risk. Presenter and panelist, Product Liability Advisory Council Spring Meeting, Miami, FL, March 2016.

Reitman MTF. To Your Health: Polymers in Biology and Medicine. Medical Plastics Keynote. ANTEC 2015 Conference, Orlando, FL, March 2015.

Reitman MTF. Turning failure into success: tools, techniques and practical examples for product development engineer. ANTEC FAPSIG Tutorial, Las Vegas, NV, April 2014.

Reitman MTF. Materials science of surgical meshes: Polypropylene for soft tissue repair. AATCC International Conference, Materials Track-Medical Textiles, Ashville, NC, April 2014.

Reitman MTF. PEEK: A structure-property-performance overview for medical device designers. AAOS/Solvay Education Summit: Healthcare Industry Perspective to Support Innovation and Product Development in a Challenging Global Environment, New Orleans, LA, March 2014.

Reitman MTF. Assessment of proposed division by type for F2026 in light of material, manufacturing and testing variability. ASTM F04 Committee meeting, Jacksonville, FL, November 2013.

Reitman MTF. Materials science of surgical meshes: Polypropylene for soft tissue repair. American Urogynecology Society (AUGS) 34th Annual Scientific Meeting, Mesh Special Interest Group, Las Vegas, NV October 16, 2013.

Reitman MTF. Structure-property overview of medical polymers. 4th China International Medical Device Regulatory Forum (CIMDR), Xi'an, China, September 2013.

Reitman MTF. Failure analysis of polymeric materials in medical applications: Lessons for successful material selection. Polymers and Plastics in Medical Devices San Francisco, CA, June 2013.

Reitman MTF. Failure analysis tools. Workshop on Future Needs for Service Life Prediction of Polymeric

Materials. NIST and Underwriters Laboratories, Gaithersburg, MD, October 2012.

Hoffman J, MacLean S, Ralston B, Reitman M, Ledwith P. Fractography of unfilled thermoplastic materials experiencing common mechanical failure modes. Materials Science & Technology 2012 Conference, Pittsburgh PA, October 2012.

Hoffman J, Reitman M, Ledwith P. Microscopic characterization of CPVC failure. Materials Science & Technology 2012 Conference, Pittsburgh PA, October 2012.

Reitman MTF. Polymer material properties for next generation medical devices. Invited Speaker: MedTech Polymers, UBM Canon, Chicago, IL, September 2012.

Reitman MTF. Polymers for medical applications. Fundamentals and Fellows Forum, ANTEC 2012, Orlando FL, April 2012.

Reitman MTF. Plastic and composite product failures. Invited lecture in Failure Analysis of Emerging Technologies. Stanford University Department of Materials Science and Engineering, Menlo Park, CA October 2009.

Reitman MTF. Factors for success: Plastics in injection molded medical devices. Part of Injection Molding Works for Medical Design, Design News Webcast, October 2008.

Reitman MTF. Plastic and composite product failures. Keynote Speaker: Third International Conference on Engineering Failure Analysis (ICEFA III), Elsevier, Sitges Spain, July 2008.

Reitman MTF. Multiphase materials for medical device applications, an overview. Medical Device and Manufacturing (MDM), Canon Communications, various locations, Jan-June 2008.

Reitman MTF. Nanotechnology and plastics for medical devices. Capitalizing on Nanoplastics, Intertek PIRA San Antonio TX, February 2008.

Reitman MTF. Nano additives in composites and coatings for medical device applications. Medical Device and Manufacturing Minneapolis, Canon Communications, Minneapolis MN, October 2007.

Reitman MTF, Swanger LA. Practical tips on how to manage your technical expert in patent disputes. Ropes & Gray IP Master Class, Live Teleconference, June 2007.

Reitman MTF, Kennedy E. Root cause failure analysis and accident investigation. Lorman Educational Services, Live Teleconference, November 2007.

Reitman MTF. Plastics failure analysis: Case studies. Baltimore/ Washington Chapter of SAMPE, October 2006.

Reitman MTF. Plastics failure analysis. Baxter Global Plastics Processing Conference 2005, Schaumburg IL, 2005.

Fahey MT. Fiber mechanics, corrosion, sealants: Tales of a 3M materials scientist. Class of 1960's Scholars Program, Williams College, 1999.

Fahey MT. Adhesives and sealants for the telecommunications industry. Riverwood V Conference, St. Paul MN, 1998.

Advisory Appointments

UL Forum on Initiatives to Improve the Long Term Aging Program, LTTA Tools Working Groups, Underwriters Laboratories

Teel Manufacturing Technical Advisory Board

Solvay Advanced Polymers Healthcare Board of Advisors

Peer Reviews

Reviewer, Medical Plastics Technical Program Committee, Society of Plastics Engineers

Reviewer, Failure Analysis and Prevention Technical Program Committee, Society of Plastics Engineers

Reviewer, book proposals and submissions related to polymer science, ASM International, Elsevier, John Wiley, Hanser, NIST