

Exponent®
Engineering & Scientific Consulting

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

Group Vice President and Principal Engineer | Polymers & Chemistry
Natick
+1-508-652-8541 | mreitman@exponent.com

Professional Profile

Maureen Reitman, Sc.D., P.E., NAE, FSPE, is a principal engineer and group vice president overseeing three Exponent practices: Polymers & Chemistry, Health Sciences, and Biomedical Engineering & Sciences. She has over 30 years of experience in polymer science, materials selection, and product development.

Dr. Reitman advises companies in industries such as life sciences, infrastructure, manufacturing, and industrial chemicals, as well as government entities and law firms, on polymeric materials performance, new product commercialization strategy, intellectual property analysis, and technical disputes. She has particular expertise in medical plastics, high-performance coatings and adhesives, functional textiles, additives and formulated products, and the history of the plastics industry.

Polymers Commercialization Advising

Dr. Reitman provides high-level advisory services to manufacturers, raw material suppliers, and product development teams seeking to introduce new capabilities, improve existing systems, and commercialize products that rely on the performance and durability of polymeric materials, including plastics, rubbers, adhesives, composites, and specialty formulations. Her advisory work spans the full product lifecycle: from materials selection and scale-up through end-use testing, certification, and regulatory strategy.

Dr. Reitman has served on technical advisory boards for major chemical manufacturers and contract converters, helping clients make capital investment decisions, prioritize R&D programs, expand into new markets, and develop technical visibility strategies for novel materials. Her industrial experience at 3M, where she held both research and management roles, informs a practical, global, business-aware approach to materials consulting that bridges laboratory science and commercial strategy.

Medical Device & Combination Device Consulting

Dr. Reitman advises medical device manufacturers, combination device developers, and life sciences companies on the selection, performance, and regulatory compliance of polymeric materials used in implants, diagnostic components, drug delivery systems, and surgical tools. Her expertise encompasses permanently implantable polymers, biocompatibility considerations, accelerated and natural aging of medical-grade materials, and the effects of hospital disinfectants and sterilization processes on polymers.

Dr. Reitman has supported clients in responding to FDA inquiries, evaluating product consistency, and making recall decisions for combination devices that rely on polymeric components. She has served as an expert witness in medical device and combination device litigation and proceedings, including matters involving transdermal and other drug delivery systems, surgical mesh, women’s health products,

orthopedic implants, cardiovascular stents and grafts, medical balloons, ocular implants, diagnostic consumables, and hospital equipment.

Performance and Durability of Products that Rely on Polymers

Dr. Reitman assists clients across medical, industrial, chemical, consumer, communications, and infrastructure sectors in identifying and evaluating materials to achieve product performance goals, especially when success requires a balance of performance, sustainability, manufacturability, cost, and supply challenges. This can be part of material selection for new applications, material substitution and alternatives analysis for existing applications, or as part of an analysis of historical compositions and the evolving state of the art in plastics technologies.

Dr. Reitman evaluates candidate materials against technical performance requirements, regulatory standards, processing constraints, and end-use testing protocols to assess service life and potential failure mechanisms, helping clients maintain product functionality while managing user and environmental risk. She builds on her extensive failure analysis expertise and deep familiarity with UL standards, ASTM test methods, and FDA regulatory frameworks to provide practical, actionable guidance.

Polymeric Materials Expert Testimony

Dr. Reitman serves as a testifying expert in product liability, intellectual property, toxic tort, construction litigation, contract disputes, and international arbitration matters involving polymeric materials and products that rely on them. Her testimony experience spans plastics, composites, rubber, coatings, textiles, adhesives, and specialty formulations across consumer product, medical device, infrastructure, automotive, and industrial sectors.

Dr. Reitman has been retained to provide expert opinions in U.S. federal and state courts, International Trade Commission (ITC) Section 337 investigations, Canadian superior courts, and international arbitration forums. Her opinions address material performance and durability, material identification, formulation analysis, the technical basis for product performance claims, supply chain risk, and failure mechanisms, as well as allegations of product defect in design, materials, or manufacturing, providing legal teams with rigorous, defensible scientific analysis on matters where the chemistry and behavior of polymeric materials are at issue.

Dr. Reitman has testified in patent and trade secret disputes involving medical, dental, and drug delivery devices; sports and recreation equipment; specialty coatings; food and beverage packaging; high-performance textiles; superabsorbent polymers; protective underlayment; and proppants, among other topics. She assists clients in early stage assessments of the IP landscape for strategic and due diligence purposes, as well as in product infringement evaluations and validity analyses.

Beyond disputes related to intellectual property and the life sciences, Dr. Reitman has provided analysis and opinions related to products such as components of plumbing and heating systems, industrial and chemical processing equipment, windows and roofing, motor and fuel system components, paints and coatings, specialty fibers, nonwovens, apparel and protective gear, sports surfaces, historical plastics compositions, adhesives, sealants, and encapsulants.

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

Elected Member of the National Academy of Engineering (NAE), 2024

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.

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.

Project Experience

Polymers Commercialization Advising

Dr. Reitman has led high-level advisory engagements for chemical manufacturers, contract converters, and government research institutions, helping clients make strategic decisions about materials, markets, and manufacturing investments. Representative engagements include:

- Advised a major global chemical manufacturer's healthcare polymers business unit on the strategy for introducing a permanently implantable polymer to the orthopedic and dental device

markets, including assessment of the competitive landscape, regulatory pathway, standards implications, and technical publication strategy; the product was successfully commercialized and relevant industry standards were updated to reflect its market availability.

- Served on the technical advisory board of a specialty polymer converter supplying cosmetic, healthcare, diagnostic, infrastructure, and personal care markets, providing guidance on R&D program prioritization, capital equipment investment decisions, staff capability development, and evaluation of potential international joint ventures to expand market reach.
- Developed and updated performance specifications for special protective coatings used in high-containment (BSL-3, BSL-3Ag, and BSL-4) research laboratories on behalf of the National Institutes of Health (NIH), working across the coatings industry to advance the state of the art for biocontainment applications; the resulting specifications enabled critical vaccine and infectious disease research requiring the highest levels of chemical resistance and containment integrity.

Medical Device & Combination Device Consulting

Dr. Reitman has supported medical device manufacturers, combination device developers, and life sciences companies across the full product development and dispute lifecycle, with particular depth in implantable polymers, drug delivery systems, and medical-grade material performance.

- Supported a joint development partner to a major pharmaceutical company in assessing product consistency and responding to FDA inquiries for a transdermal drug delivery combination device relying on polymeric materials; presented findings directly to the FDA and assisted in recall decision-making.
- Evaluated technology transfer and development timelines related to blood handling component that was the basis for an earn-out dispute.
- Assessed the characteristics and in vivo stability of implantable polypropylene fibers used in surgical mesh for soft tissue repair, providing technical analysis of material degradation, oxidative stability, and the relationship between fiber properties and clinical performance in the context of product liability proceedings. Collaborated with physician organizations to communicate state-of-the-art insights for these materials.
- Evaluated the accelerated and natural aging behavior of polycarbonate urethane acetabular components and polyurethane cervical disc materials, applying small punch testing and morphological analysis to assess long-term performance and support regulatory and litigation needs for orthopedic implant manufacturers.
- Characterized manufacturing defects in medical balloons, applying complementary microscopic and fractographic analysis methods to determine root cause. Separately evaluated claimed trade secret aspects of balloon manufacturing and provided expert testimony based on findings.
- Evaluated protective coatings for implantable medical devices, including assessment of coating adhesion, chemical resistance, and long-term durability requirements for devices intended for permanent implantation.

Performance and Durability of Products that Rely on Polymers

Dr. Reitman assists clients in identifying, evaluating, and qualifying polymeric materials for new applications, for substitution in existing applications, or in investigations of historical compositions against the evolving state of the art in plastics technologies.

- Provided companies slates of materials candidates for demanding new products, including next-generation filtration capabilities, consumer electronics components, protective coatings, and delivery systems for regulated substances based on a systematic assessment of existing and emerging technologies.
- Conducted materials selection and alternatives analyses for clients in the consumer products, industrial, and infrastructure sectors, evaluating formulations and material systems against applicable UL standards (UL 94, UL 746, UL 758, UL 1694), ASTM test methods, and industry-specific performance requirements to support innovative advancements and material transition decisions.
- Advised medical device manufacturers on the identification and technical evaluation of polymers in device components, including alternatives to fluoropolymers, polycarbonate, and PVC in legacy systems, by assessing candidate materials against biocompatibility requirements, processing constraints, regulatory standards, and end-use performance specifications.
- Assessed the technical and regulatory implications of transitioning from legacy polymer systems to alternative materials in wire and cable insulation, plastic piping, and specialty coating applications, providing clients with structured evaluations of performance trade-offs, qualification testing requirements, and certification pathway considerations.

Polymeric Materials Expert Testimony

Dr. Reitman has been retained as a testifying expert in a wide range of disputes involving the identification, performance, formulation, and failure of polymeric materials, spanning product liability, intellectual property, toxic tort, and contract matters in U.S. and international forums.

- Served as a testifying expert in an International Trade Commission (ITC) Section 337 investigation involving super absorbent polymers (SAPs), providing opinions on material composition, performance characteristics, and the technical basis for domestic industry claims related to polymer importation and patent exclusivity.
- Provided expert testimony in intellectual property disputes involving polymer-based technologies, including matters related to specialty textile structures on cardiac implants, recyclable multilayer film structures, dental aligner materials, adhesives for basketball backboard assemblies, functional food packaging, solar cell encapsulants, roofing underlayment, specialty coating formulations, and fiber manufacturing, addressing questions of claim construction, infringement, and the technical validity of patent assertions as well as the basis for trade secret claims.
- Testified in Federal Trade Commission (FTC) labeling disputes involving bio-sourced and renewable textile materials, including matters concerning rayon derived from bamboo and protein-grafted fiber products, providing technical analysis of material composition, manufacturing processes, and the accuracy of consumer-facing material descriptions.
- Provided expert testimony related to the performance of products and protective gear subjected to fires or firefighting conditions, focused on material capability and performance in extreme conditions.
- Testified in matters involving performance and durability of building components, including hydronic heating tubes, CPVC sprinkler systems, window components (IGU sealants and spacers), composite roofing materials, laminated and solid countertops, and prefinished siding.
- Testified in matters involving historical formulating components such as asbestos, talc, PCBs, and PFAS, addressing issues including applications, expected service life, alternatives, product identification, test method capabilities, and factors related to exposure risk.

- Testified in international arbitration proceedings involving disputes over the performance, specification compliance, and failure of polymeric materials used in infrastructure and construction applications, providing technical analysis of material properties, applicable standards, and the causal relationship between material characteristics and alleged performance deficiencies.
- Provided expert analysis in cross-border disputes related to medical, construction, automotive, and other products relying on polymer technology.

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