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John Moalli, Sc.D.

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Professional Profile

Dr. Moalli is a nationally recognized expert in polymeric materials, and addresses issues related to plastics, composite materials, rubbers, adhesives, and general materials science. His specialties include product design and development, analysis of fracture surfaces, combustion behavior, experimental mechanical, chemical and physical property evaluation, development of constitutive relations, fracture behavior, patent analysis, and risk analysis in polymer and polymer composite systems.

Dr. Moalli is familiar with risk assessment through use of Failure Modes and Effects Analysis (FMEA) and large-scale accident databases.

Dr. Moalli has published a book and several book chapters on failure of polymeric materials. He has an academic appointment at Stanford University where he teaches a course in Engineering Design, and serves as an academic advisor to undergraduate students. His current areas of research pertain to the evaluation of polymers in medical devices (hip implants, knee implants, breast implants, sutures, catheters, ICD's), automotive and vehicular applications (fuel tanks, hoses, suspension components, restraint systems, structural composites, helmets), aerospace structures and devices (aircraft composites, fuel system components), construction materials (plastic pipe and fittings, composite pipe, hose, flooring materials, adhesives, windows), electrical (insulation, circuit boards, encapsulants) and recreational equipment (skis, bindings, bicycles, footwear).

Academic Credentials & Professional Honors

Sc.D., Polymers, Massachusetts Institute of Technology (MIT), 1992

B.S., Civil Engineering, Northeastern University, 1987

Tau Beta Pi

Sigma Xi

Chi Epsilon

John Wullf Award for Excellence in Teaching (MIT Department of Materials Science and Engineering)

Walter Gores Award for Excellence in Teaching (Stanford University)

Society for the Plastics Industry Best Paper Award (2)

Joseph P. Lawler Award for Cooperative Education

Percy J. Hill Award for Excellence in Engineering Design

Board of Directors: Spring Street International School

Academic Appointments

Stanford University Department of Chemical Engineering, Adjunct Professor, 2018-present

Stanford University Department of Chemical Engineering, Lecturer, 2005-2017

Professional Affiliations

Society for the Plastics Industry (member)

Society for Plastics Engineers (senior member)

Patents

United States Patent Number 11,318,780 B2: Apparatus for forming dye sublimation images and texturing the surface of solid sheets of the substrate. Issued May 3, 2022

United States Patent Number 11,065,909 B2: Apparatus for forming dye sublimation images and texturing the surface of solid sheets of the substrate. Issued July 20, 2021

United States Patent Number 10,940,715 B2: Method for forming dye sublimation images in and texturing of solid substrates. Issued March 9, 2021

United States Patent Number 10,583,686 B1: Method for forming dye sublimation images in and texturing of solid substrates. Issued March 10, 2020

U.S. Patent Number 8,308,891: Method for forming dye sublimation images in solid substrates. Issued November 13, 2012 (with J. Drake)

Publications

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

Reitman M, Moalli J. Polymeric coatings for medical devices. Medical Device and Manufacturing Technology, Touch Briefings 2006; 28-30.

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

Melinek J, Lento P, Moalli J. Postmortem analysis of anastomotic suture line disruption following carotid endarterectomy. Journal of Forensic Science 2004; 49(5).

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.

Moalli J, Coakley S, Pye J. Failure analysis of a large diameter floating marine hose. Proceedings, Society of Plastic Engineers, ANTEC 2002.

Medhekar S, Moalli J, Caligiuri R. Practical risk analysis as a tool for minimizing plastic product failures. Proceedings, Society of Plastics Engineers, ANTEC 2000.

Moalli J, Kurtz S, Sire R, Srivastav S, Wu M. Avoiding the GIGO syndrome—Combining the real and virtual worlds in the analysis of polymer product failures. Society of Plastics Engineers, ANTEC 2000.

Moalli J. Translating failure into success—Lessons learned from product failure analysis. Society of Plastics Engineers, ANTEC, 1999.

James SP, Moalli J. Failure Analysis of Polymeric Medical Devices. Medical Plastics Biomaterials 1994; I(2).

Moalli J. Ceramic coated rigid rod polymer fibers. SAMPE Quarterly 1992; 23(4), July.

McGarry FJ, Moalli J. Ceramic coated rigid rod polymer fibers. Proceedings, 47th Annual Society for the Plastics Industry Conference, Cincinnati, OH, 1992.

McGarry FJ, Moalli J. New single fiber test methods. Proceedings, 46th Annual Society for the Plastics Industry Conference, Washington, DC, 1991.

McGarry FJ, Moalli J. Mechanical behavior of rigid rod polymer fibers: I. Measurement of axial compressive and transverse tensile strengths. Polymer 1991; 32(10).

McGarry FJ, Moalli J. Mechanical behavior of rigid rod polymer fibers: II. Improvement of compressive strengths. Polymer 1991; 32(10).

Book Chapters

Moalli J, Robertson CR, Black DL. Reference guide on engineering. In: Reference Manual on Scientific Evidence, Third Edition. National Academies Press, Washington DC, pp 897-959, 2011.

Failure Causes. In: ASM Handbook. Volume 21, Composites. ASM International, Material Park, OH, pp. 951-952, 2001.

Failure analysis of polymeric medical devices. In: Medical Plastics—Degradation Resistance and Failure Analysis. Portnoy RC (ed), PDL, Norwich, NY, pp. 13-20, 1998.

Books

Moalli J (ed). Plastics failure analysis and prevention. First Edition, William Andrew Publishing, Norwich, NY, 2001.

Presentations

Moalli J. Debunking junk science and engineering. DRI Damages Seminar, March 2010.

Moalli J, Day J. An engineering perspective on breast implant design: Balancing function, properties, and longevity. Technology and Innovation in Plastic Surgery, May 2010.

Reitman M, Moalli J. 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.

Kurtz SM, Jewett CW, Vogt RM, Edidin AA, Moalli J. The true ultimate stresses and fracture morphology of ultra-high molecular weight polyethylene upon tensile failure. Transactions of the ASME Summer Bioengineering Conference, June 1997.

Millstein PL, Risciotti E, Moalli J. Adhesion of condensing pluggers and composite placement. Proceedings, International Association of Dental Research Conference, Rio de Janeiro, Brazil, 1991.