



**Exponent<sup>®</sup>**  
Engineering & Scientific Consulting

## Corissa Lee, Ph.D.

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### Professional Profile

Trained as a material scientist with a specialization in polymer science, Dr. Lee's research and experience provide deep understanding of the chemistry, physical properties, and mechanical behavior of polymeric materials, including rubbers, elastomers, adhesives, and rigid plastics. Her areas of expertise include structure-property relationships of materials, mechanics of materials, adhesion science, chemical and physical compatibility of materials, and fractography.

Dr. Lee leverages her knowledge of polymer science in a wide variety of industries including automotive, consumer electronics, construction, medical, and industrial piping. She has assisted clients with durability assessments, materials specifications, formulation, end-use testing, product safety evaluations, and failure analysis in both proactive and reactive programs. Dr. Lee is also well-versed in common polymer failure modes including wear, tearing, environmental stress cracking, fatigue, creep, and weathering.

Dr. Lee has extensive experience in the characterization of materials ranging from analytical and molecular level analysis to bulk physical properties testing and has applied these to commodity and engineering thermoplastics, rigid and rubber thermosets, and other industrially relevant compositions. She has particular expertise in standardized mechanical testing, long-term durability testing, and accelerated aging studies. She is also familiar with polymer conversion processes such as injection molding, compression molding, blow molding, extrusion, and thermoforming. Dr. Lee is a member of Society of Plastic Engineers (SPE), Society of Automotive Engineers (SAE), and The Tire Society, and is certified as an Automotive Tire Service Advanced Instructor through the Tire Industry Association (TIA).

Prior to joining Exponent, Dr. Lee was a research assistant in the Department of Material Science and Engineering at the University of Illinois at Urbana-Champaign and had work assignments at Xerox and Dow Corning. During her time at Xerox and Dow Corning, she studied the flow properties of toners and investigated new novel block copolymer synthesis techniques, respectively. At the University of Illinois, she was a member of the collaborative Autonomous Materials Systems at the Beckman Institute working in the area of mechanochemistry. Her research involved the incorporation of force-sensitive chemical groups (mechanophores) directly into polyurethane elastomeric formulations to impart new functionalities to materials, such as self-sensing (i.e. color change) and self-repairing. These "smart" polymers autonomically respond to changing environmental conditions and are capable of intrinsically detecting applied forces or subsequent mechanical damage.

### Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, University of Illinois, Urbana-Champaign, 2013

B.S., Materials Science and Engineering, Cornell University, 2008

## Prior Experience

Research Assistant, University of Illinois at Urbana-Champaign, 2008-2013

Summer Intern, Dow Corning, 2007, 2008

Research Assistant, Cornell University, 2007-2008

Summer Intern, Xerox, 2006

## Professional Affiliations

Society of Plastics Engineers

Society of Automotive Engineers

The Tire Society

## Languages

Cantonese Chinese

## Patents

Patent No. US-2011/0294958 A1: Method of Forming a Non-Random Copolymer, December 1, 2011 (with D. Ahn, C.L. Wong).

## Publications

Lee CK, et al. Fractographic examination and tensile property evaluation of 3D printed acrylonitrile butadiene styrene (ABS). Proceedings, ANTEC, 2015.

Lee CK, et al. Solvent swelling activation of a Mechanophore in a polymer network. Macromolecules 2014; 47(8), 2690-2694. doi:10.1021/ma500195h.

Lee CK, et al. Exploiting force sensitive Spiroyrans as molecular level probes. Macromolecules 2013; 46(10), 3746-3752. doi:10.1021/ma4005428.

Lee CK, et al. Force-induced redistribution of a chemical equilibrium. Journal of the American Chemical Society 2010; 132(45), 16107-16111. doi:10.1021/ja106332g.

## Presentations

Lee CK, et al. Fractographic examination and tensile property evaluation of 3D printed acrylonitrile butadiene styrene (ABS)., ANTEC, Orlando, FL, 2015.

Lee CK. Force-induced redistribution of a chemical equilibrium. 3rd International Conference on Self-Healing Materials, Bath, UK, 2011.

Lee CK. Mechanochemistry in polyurethanes. Beckman Graduate Student Seminar Series, Urbana, IL, 2010.

Lee CK. Mechanochemistry in thermoplastic polyurethane. Materials Research Society Fall Meeting, Boston, MA, 2009.

Lee CK. Mechanically activated spiropyran in thermoplastic polyurethane. Poster Presentation, 2nd International Conference on Self-Healing Materials, Chicago, IL, June 2009.