

# Lawrence Drzal

**University Distinguished Professor of Chemical Engineering and Materials Science at Michigan State University**

East Lansing, MI, US

Expertise in adhesion, surface modification, composites/nanocomposites, graphene nanoplatelets, and multifunctional materials.

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## Biography

Lawrence T. Drzal obtained a BChE from the University of Detroit and a PhD from Case Western Reserve University in Chemical Engineering in 1974. From 1972 until 1985 he was a military and civilian engineer/scientist at the USAF Materials Laboratory where he worked adhesively bonded joints and the carbon fiber-matrix interphase in composite materials. Professor Drzal's research is primarily in surface and interfacial aspects of polymers in adhesive joints and the fiber-matrix interphase in composite materials. This has consisted of research on carbon, glass, cellulose and aramid fiber surfaces: fiber/matrix adhesion measurement; surface modification by plasma, sulfonation and UV light in air; adhesion to thermoset and thermoplastic polymers; via microwave, e-beam, liquid and powder processing. His current research is directed at polymer nanocomposites and bio-composites, including graphene nano-platelets, their surface chemistry and processing to improve the mechanical, thermal, and electrical and barrier properties of the resulting multifunctional composites. Major research is also underway to develop biobased, sustainable, structural bio-composites from bamboo, kenaf and other plant fibers. Dr. Drzal and his group members have published over 450 research papers (H Index = 101), have been awarded 41 patents and over 600 presentations at national and international conferences. He has received numerous awards for his research. Dr. Drzal is a University Distinguished Professor of Chemical Engineering and Materials Science at Michigan State University. He is Director of the Composite Materials and Structures Center at MSU, an interdisciplinary research center focusing on all aspects of polymeric, composite materials and their processing. He was co-Director of the NSF State/Industry/University Center for Low-Cost, High-Speed Polymer Composites Processing. From 2015 to 2018 he was the Vehicle Application Director of the Institute of Advanced Composite Manufacturing Innovation (IACMI). Dr. Drzal is a founding member of the Adhesion Society (President 1998-2000) and the American Society for Composites. In 2007, Dr. Drzal co-founded XG Sciences, Inc, a private Michigan company that is the world's largest manufacturer of graphene nanoplatelets using processes and technologies developed at MSU. XG Sciences currently has 50+ employees. He serves as its Chief Scientist.

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## Industry Expertise

Education/Learning, Plastics, Chemicals, Research

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## Areas of Expertise

Carbon Fibers, Ultraviolet Light Surface Modification, Multifunctional Materials, Composite Materials, Adhesion, Graphene Nanoplatelets, Plant Fiber Biocomposites, Composite Processing

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## **Education**

### **Case Western Reserve University**

Ph.D. Chemical Engineering and Polymer Science

### **University of Detroit**

B.S. Chemical Engineering

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## **Accomplishments**

### **Lifetime Achievement Award**

2016 Awarded by the Society of Plastics Engineers, Automotive Division.

### **Medal of Excellence in Composite Materials**

2016 Awarded by the University of Delaware

### **Membership**

2015 National Academy of Inventors

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