



Tyler Research Center

# Kansas Polymer Research Center

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## The Kansas Polymer Research Center at Pittsburg State University

specializes in vegetable oil-based polymer research and development. KPRC scientists work with industrial partners, state and federal agencies, and producer associations on developing and commercializing PSU's intellectual property. The KPRC has partnered with Cargill, a leading agribusiness company, in the global commercialization of a line of soy polyols that have applications in the automotive, construction, and home furnishing industries.

The KPRC research team currently includes twelve polymer scientists and several undergraduate and graduate assistants in chemistry and plastics engineering technology. Since 1994, research contracts have provided the basis for KPRC further developing its expertise in bio-based polymers. Core funding is provided by the Kansas Technology Enterprise Corporation (KTEC). Other funding organizations have included the U.S. Department of Energy, U.S. Department of Agriculture, United Soybean Board, Kansas Soybean Board, and the Missouri Soybean Merchandising Council. Other clients have funded a range of non-vegetable oil polyurethane testing, research, and development.

The Tyler Research Center, a 22,000 sq. ft. state-of-the-art facility enables the KPRC to provide a full range of research and development services in several bio-based product areas. KPRC scientists do not have teaching responsibilities and are able to devote full-time to their research projects.

Researchers at the KPRC have access to plastics industry production equipment as part of their collaboration with PSU's four-year nationally accredited undergraduate degree program in plastics engineering technology. Engineering product design and development assistance is also available from the College of Technology engineers and faculty. Supporting research capabilities are also provided by the PSU Department of Physics and Department of Chemistry.

### AREAS OF INTEREST

Although the KPRC is among the world leaders in vegetable-oil based polymers, our scientists also have experience in the following related areas and are constantly seeking partnerships with industries and agencies with similar interests:

- |             |          |                |            |
|-------------|----------|----------------|------------|
| Adhesives   | Coatings | Pre-polymers   | Solvents   |
| Bioplastics | Foams    | Polymeric oils | Composites |

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## Director's Message

Welcome to the Kansas Polymer Research Center at Pittsburg State University.



We are among the world leaders in applied R & D converting vegetable oils to polymers for use in industrial applications. Our scientists have more than 100 years combined experience with polyurethane chemistry and more than 200 publications and presentations in the field.

We are firmly focused on the future and meeting the needs of our clients, as evidenced by our state-of-the-art research facility, extensive analytical equipment, and growth capabilities. While our clients are our future, our staff is central to our success. Dedicated, award-winning individuals come together in a variety of disciplines to consistently deliver results for our clients' most pressing needs.

We encourage you to pay us a visit, meet our people, and see our facilities. Let the KPRC play a part in your success.

Dr. Andrew Myers,  
Executive Director

## KPRC Lead Scientists

The KPRC lead scientists are known throughout the world for their work in bio-based applications.

The KPRC has received 11 patents, with several more pending. KPRC lead scientists include:

### DR. ZORAN PETROVIC Research Director

Dr. Petrovic earned his Bachelor of Engineering degree at Faculty of Technology, Belgrade University, Yugoslavia, and his doctorate at Strathclyde University, Glasgow. He worked in the electrical industry for 12 years specializing in problems of application of polymers in electrical insulation. From industry, he moved to the Faculty of Technology, University of Novi Sad, Yugoslavia, where he taught Physical Chemistry of Polymers. He spent three years at the Polymer Science and Engineering Department, University of Massachusetts, at Amherst. He has published over 100 papers, three books, and has 11 patents. His special interests are polyurethanes, networks and gels, and polymer characterization.

### DR. IVAN JAVNI Research Manager

Dr. Javni earned his Bachelor of Engineering and Master of Science degrees at the Faculty of Technology, Tuzla, and his doctorate at University of Novi Sad, Yugoslavia. He taught at the Faculty of Technology, Tuzla, (1971-81), before joining Soda-So Co., a major producer of urethane components and systems in Yugoslavia, and was the head



Petrovic



Javni



Ionescu

of the Polyurethane Institute. He was also elected as an UNESCO expert for polyurethanes. He has published over 30 papers, and has several patents and patent applications. His special interests are polyurethanes and elastomers.

### DR. MIHAIL IONESCU Senior Research Scientist

Dr. Ionescu earned his Master of Science degree and doctorate at Faculty of Industrial Chemistry, Polytechnic Institute, Bucharest, Romania. He has 35 years experience in the field of polymer synthesis, especially synthesis of polyols for polyurethanes at the Institute of Chemical Research, Bucharest, Romania. He was Chief of the Polymer Synthesis Department (1991-1997), Scientific Director (1997-2003), and President of Scientific Council (1996-2003). He holds 70 Romanian patents in several areas of chemistry. He has more than 80 journal publications and has published three textbooks on polymers. Dr. Ionescu is a member of the New York Academy of Science and has been internationally recognized in the area of polyols for polyurethanes. His special interests are bio-based polymeric materials, especially polyols and polyurethanes based on vegetable oils.

## PRESIDENTIAL GREEN CHEMISTRY CHALLENGE AWARD

In 2007, scientists with the Kansas Polymer Research Center at received the prestigious Presidential Green Chemistry Challenge Award for their groundbreaking discoveries with environmentally friendly materials in conjunction with industry research partner, Cargill, Inc.

The award in the Designing Greener Chemicals category recognizes the KPRC and Cargill scientists for the invention of the new family of BiOH™ Polyols. Derived from natural vegetable oils such as soybean oil, BiOH™ Polyols help manufacturers of flexible and rigid polyurethanes reduce the impact on the environment.

"I am incredibly proud of the world-class research being performed by our scientists at the Kansas Polymer Research Center and the benefits their discoveries provide for our industry partners," said former PSU President Dr. Tom Bryant, "The work they are doing is making our Earth a little greener and our technologies smarter. It is a wonderful honor for these scientists and for Pittsburg State University."



## KPRC Facilities and Equipment

In September 2007, the KPRC moved into the 22,000 sq. ft. state-of-the-art Tyler Research Center on the PSU campus. KPRC scientists do not have teaching responsibilities and are able to devote full attention to your R & D project.

In addition, the KPRC is one of the best-equipped laboratories in the Midwest, with several instruments usually found in only the largest of universities or private labs. We are also able to proceed to small-scale manufacturing with equipment such as injection molding machines, extruders, and thermo-forming machines at the Kansas Technology Center on the PSU campus.

The Tyler Research Center facility includes space for true bench-to-market product development. A 2,500 sq. ft. applications area is located adjacent to the lab and will accommodate a small manufacturing operation. This section of the building has a separate entrance and can be leased out for a start-up operation.

*Matching research funding is available through several state of Kansas organizations.*



The Kansas Polymer Research Center is a KTEC Center of Excellence, funded in part by the Kansas Technology Enterprise Corporation. The KPRC is an unincorporated division of Pittsburg State University, which is a state-owned entity separately managed and distinct from KTEC.



KANSAS BIOSCIENCE  
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