

What is the Particle Technology Research Centre?

The Department of Chemical Engineering at The University of Western Ontario has a reputation for excellence and is a national and international leader in particle-related research. To continue with this tradition, Western's researchers have formed the Particle Technology Research Centre (PTRC), dedicated to advancing research, innovation and technological development in the broad area of particle technology. The Centre consolidates the efforts of Western's faculty working in particle research and brings pioneering discoveries to the forefront of this field. With 19 faculty members and more than 100 researchers, the PTRC is developing novel technologies that are shaping the future of particle-related industries.



The Particle Technology Research Centre team

Particle Research Facility

In the fall of 2005, as part of an ongoing effort to establish a comprehensive particle research facility at Western, the PTRC and the Department of Chemical and Biochemical Engineering opened the Particle Research Facility (PRF). This research and development hub promotes industrial research collaborations and provides a wide range of expert analytical and customized particle technology solutions and services to other institutions, research groups and industrial centres. The PRF has eight separate laboratories with 10,000 square feet of space and state-of-the-art instrumentation worth in excess of \$5 million. This equipment includes more than 20 fluidized bed reactors and devices for classifying, sieving, de-agglomerating, extruding, spray-drying and particle formation.

Research

The Centre's scientists are engaged in a diverse array of research programs related to fluidization, ultra-fine powder processing, aerosol chemistry, particle production and characterization, biotechnology, and environmental remediation and clean fuel technology. The PTRC group actively develops new particle-related technologies and has extended their research into areas such as industrial crystallization, nano-ceramics, nano-biomaterials, pharmaceuticals and drug delivery. They are exploring numerous projects such as the inactivation of bio-aerosols, the destruction of volatile organic compounds and the extraction of proteins using liquid-solid fluidized beds.

Applied Research

Because there is an increasing need for particle technology, the PTRC is committed to advancing novel discoveries and expanding particle technology research into new and emerging areas. The Centre is developing a multidisciplinary research program that holds great promise for many industrial, environmental and medical applications, with significant benefits for the chemical, biochemical, bio-materials, cosmetics, food and metallurgical industries. Western's nanoparticle and ultrafine powder technology has the potential to revolutionize the pharmaceutical industry—the PTRC has created a novel inhaled drug delivery method that obviates the need for oral drug administration. This system allows a much smaller fraction of medicine to be used, making drug delivery safer, more effective and painless. The Centre's engineers are also developing high quality, efficient ultrafine paint powders that, unlike conventional methods, can be applied to cars without adverse health or environmental effects.

Notable Achievements

The PTRC was the first such centre to be established in Canada. The Centre's members have received numerous patents for their research in areas such as ultra-fine powder coating technology, wastewater treatments, pulmonary drug inhalation devices, agri-food waste conversion, gasification of municipal wastes and novel protein extraction. The group generates a significant number of intellectual properties and inventions, such as novel super-hydrophobic surface coatings and novel wear testers for testing dental materials, which are continually being transferred into commercial processes and products. Researchers with the PTRC have established invaluable partnerships with many institutes and companies, including the Stiller Centre for Biotechnology Commercialization, Integrated Manufacturing Technology Institute—National Research Council Canada, Ingenia Polymer Corporation, RadEx Powder Coatings, Northern Nanotechnology, General Motors and Eli Lilly.

For more information, please visit: www.powders.ca