

Composite Materials Research at Western University

Located in London, Ontario, Western University is situated directly in the middle of a strategic manufacturing corridor – two hours between both Toronto and Detroit, Michigan. In fact, more than 30 per cent of Canada's population can be accessed by a 2.5-hour drive.

Western is one of the country's leading research-intensive medical universities, and home to international-calibre strengths in materials and biomaterials, biomedical imaging and neuroscience, as well as wind engineering. Research in many of these strength areas is leading to advancements in composite materials and advanced manufacturing, particularly through the following efforts:



Research at Western University benefits a variety of industries by helping develop composite materials for lighter, safer, more efficient products.

Materials and Surface Characterization

- **Fraunhofer Project Centre @ Western:** joint venture between Western and the *Fraunhofer Institute of Chemical Technology* in Germany
- As Canada's only open-access composites research facility, this initiative makes London the leading site for advanced composite materials research and testing at a manufacturing scale for several industrial sectors in North America, including transportation, renewable energy and construction
- **Surface Science Western:** Canada's premiere surface and materials analysis facility has more than 25 years of providing high quality, reliable analytical information that can speed development and solve production problems, while minimizing downtime and increasing profitability
- **Nanofabrication Facility:** fosters, supports and sustains advanced nanotechnology research in a wide range of disciplines, including composites characterization, physics, engineering, chemistry, biology and medicine
- Other researchers are partnering with industry to develop lighter, stronger, more cost-effective materials for a variety of sectors, including automotive, construction, clean technologies, IT and energy storage

Wind Engineering

- **Boundary Layer Wind Tunnel Laboratory:** more than 45 years of international excellence in pioneering wind engineering research
- Created to provide solutions to complex wind engineering problems, the lab's two wind tunnels reveal details about the dynamics and properties of structural loads and give architects critical insight for designing structures and using materials that can better sustain extreme winds
- The group has worked on more than 1,000 industrial projects, including such recognizable structures as the Willis (formerly Sears) Tower in Chicago, the Canary Wharf complex in London, England and the CN Tower in Toronto
- **The Insurance Research Lab for Better Homes:** first-of-its-kind facility that allows researchers to simulate and study realistic damage to full-scale houses from wind, snow and rain, while shedding light on new construction materials that make homes safer and more cost-effective
- **WindEEE Dome:** the world's first hexagonal wind tunnel facility allows scientists to address important scientific, economic and societal challenges related to wind, while evaluating energy potential and damage risks
- Researchers will work with industrial partners to test composite materials used in turbine design – leading to more efficient renewable energy generation – and to improve positioning and design of wind farms
- Sustainability research will lead to better design and retrofitting of both individual buildings and city-wide infrastructure to maximize energy savings and production, and improve construction materials

Medical Devices and Diagnostics

- Heart of a regional platform for medical device development at all stages – from pre-clinical, to clinical, to training and simulation
- Builds on interdisciplinary strengths at **Canadian Surgical Technologies and Advanced Robotics (CSTAR)**, the Schulich School of Medicine & Dentistry, the Faculties of Engineering and Science, affiliated teaching hospitals and advanced animal care facilities
- These tools are increasingly being developed on the nanoscale
- Primary applications include: powder coatings for medications, drug delivery systems, anti-microbial coatings, biosensors, cellular surgery and tissue, bone and tooth generation



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Research