

# Canada—A hotbed for printable electronics!

November 14-15, 2018

The global demand for printable electronics has grown substantially with the emergence of smartphones and tablets, solar panels, and the growth of wireless and sensor communication technologies.

The National Research Council of Canada (NRC) collaborated with industry to make Canada a global powerhouse in printable electronics and maximize the opportunities in this emerging market.

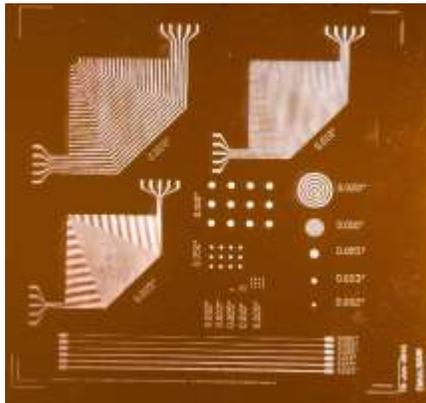
"Most involved in the printed electronics industry wouldn't have thought of Canada as a hotbed for technology development in the field. That has changed in a very short time span." Those were the words of Raghu Das, CEO of the British company [IDTechEx](#) in 2014, only two years after the launch of the NRC's [Printable Electronics program](#).



An NSM *Challenger 650* system with multiple slot-die, flexo, and gravure coating/printing stations.

"In just five years, our efforts and initiatives have enabled us to establish a significant Canadian printable electronics ecosystem and invent a new range of technologies that are now of interest to the big names in the industry." says [Thomas Ducellier](#), executive director of the NRC Printable Electronics program.

## Strong (L)inks with industry



Circuit printed with molecular ink.

Developed by the NRC's chemistry and device physics experts, molecular ink is used in various fields, including the manufacture of high-density circuits for bezels in smartphones.

"This new technology was developed in partnership with Montreal company [GGI International](#), a world leader in user interface technologies and touch applications. The ink boasts superior electrical and mechanical performance over conventional printing inks, while remaining more economical than nanomaterials." explains Dr. [Patrick Malenfant](#), Senior Research Officer at the NRC.

"We were impressed by the strategic value of working with the National Research Council. The prospects of developing new inks not commercially available and able to meet our specifications

provided our management with compelling reasons to work with the NRC. Needless to say, we obtained great value from our investment." says Sylvie Lafrenière, Director of Research and Development at GGI International.

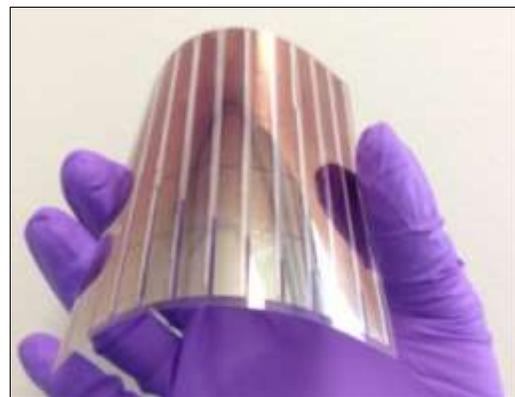
The features of the NRC's molecular ink attracted the attention of several international players, including [Sun Chemical](#), the largest molecular ink manufacturer in the world, which is [poised to produce and co-develop applications with the NRC and GGI International](#).

## An international reputation

The market for third-generation photovoltaics is gaining momentum in Europe and Asia, causing increased demand for advanced materials and their marketing.

Led by Dr. [Ye Tao](#), Principal Research Officer, a team made up of chemists and physicists from the NRC successfully developed fluoropolymers, a material that can be used in organic electronics, from photovoltaics to photodetectors to transistors due to its high efficiency and stability.

"Printed organic solar cell has coveted features such as stability, flexibility and lower production costs; what's more, it's environmentally friendly and generates electricity under low lighting conditions." explains Dr. Tao.



An example of printed photovoltaics.

With an estimated 150 percent increase in the global market for printed, flexible, and organic electronics from 2017 to 2027, the NRC will now tackle another major challenge: to cement the Canadian industry's position so that it can successfully conquer global markets.

