

Lithographically Printed Integrated Electronics (LPIE)

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This project is carrying out research to develop and fabricate integrated electronic circuits by the offset lithographic printing process, and including printed power sources. Our research group has previously conducted several successful projects in which offset-lithography (a technique used to print books and magazines) has been adapted to manufacture electronic components and circuit interconnects on a wide range of flexible materials such as paper and polymer films. Offset-lithography uses hydrophobic patterns on a printing plate to define the printed image. The group now have the capability to print a variety of electronic components using this method, resulting in a more environmentally friendly method for making electronic circuits.

A very successful initial IeMRC funded feasibility study has shown that it is possible to produce electrochemical power sources by offset lithographic printing. Dissemination of this work attracted great interest from Industrialists which stimulated this follow-up project.

Three case studies will be undertaken over an eighteen month period involving the integration of printed power sources with:

- 1.) Printed Electroluminescent Displays and other indicators
- 2.) Printed RFID tags
- 3.) 'Intelligent Paper' applications

In the medium-term, a very significant contribution to novel manufacturing methods may arise from this work. The successful integration of printed electronics and power sources would pave the way for new products and applications in the field of low-cost flexible electronics.

More immediate beneficiaries of this project include:

- Electronics manufacturers working in the area of printed electronic systems;
- Logistics and other industries that require low cost tracking technology
- Researchers in cognate engineering fields concerned with electronic integration problems e.g. manufacturing and process industries;
- The public - there is growing pressure from the public for disposable, more compact, and lighter electronics and this project offers a way to help meet the public's aspirations.

ArjoWiggins Fine Papers, Dupont Teijin Films, Gwent Electronic Materials (GEM), Hallmark Cards UK and Poly-Flex Circuits Ltd make up the consortium of Industrial partners.