

## Success Stories - Service Users

**Challenge:** Real time measurement of printed film profile for Quality Control

### Organisation Profile

Zinergy UK Ltd is dedicated to the production and commercialisation of thin film printed batteries. Founded in 2016 by a group of engineers in Cambridge, it has come from a lab development to production scale and currently devices are being integrated into multiple flexible circuit devices.

Cambridge, UK | [www.zinergy-power.com](http://www.zinergy-power.com)



### Problem to be solved

As we scale up, so does our need for maintaining a consistent quality of product. Devices are printed in various shapes and with various thickness/resistance values to match the requirement of different applications. On the printing process it is important for us to characterise printed film thickness and defects during printing so that these can be corrected for as soon as detected rather than having to wait for off-line testing. Finding a suitable technique that allows us to do this is essential for scaling up volumes further and improving the consistency of our production, as well as to help us get a better understanding of parameter/performance correlation and where defects are coming from.

### Solution provided by TEESMAT

In a first step a laboratory-based study was performed by IN-CORE Systèmes to evaluate the feasibility of an inline quality control and measurements of the requested parameters. Starting with a 2D line-scan camera based optical quality control, the optical properties of the substrate and different print layers was analysed. While it was not the main target of this study, the 2D setup demonstrated well its capability to detect print and print-registration defects. Thereafter samples were analysed with different high resolution laser triangulation and linescan stereovision systems to determine the most suitable technology and required two- and three-dimensional resolution. Results of all evaluated techniques showed good consistency and results demonstrate that they are all capable of required measurement tasks. In the following months one of the tested 3D technologies will be installed in the Zinergy production line to perform height measurements during the different production steps of the electrode.

### Impact

Computer vision permits the real time control of printed layer thickness and production quality at each critical production step enabling the identification of setup, production process and equipment related variations early on. Thereby process settings can be adapted and improved, equipment can be replaced or serviced before larger production lots are affected and out of specification electrodes can be removed before further processing steps are applied leading to an improved product performance consistency in a higher yielding production process.