SCREEN PRINTING IS KEY IN PRINTED-ELECTRONIC TECHNOLOGIES

David Forrester Zamith, Chairman of Ruy de Lacerda, explores the adaptability and efficiency of screen printing in printed electronics, its indispensable place in Europe's re-industrialisation and the role of CeNTI in building bridges between academia and industry



David Forrester Zamith - RuyDeLacerda Chairman

The Centre for Nanotechnology and Advanced Materials (CeNTI) - established in 2006 - is a testament to the power of collaboration between academia and industry. It was born from the synergy of three prestigious universities, two technological centres and one institute for new technologies, all renowned for their national and international impact. These comprise The University of Minho, University of Porto, University of Aveiro, the Technological Centre of the Textile and Clothing Industries of Portugal (CITEVE), the Technological Centre of Leather Industries (CTIC) and the Engineering and Product Development Centre (CEiiA)

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BRIDGE BUILDERS

Together, these entities have become 'bridge builders' leveraging advanced technologies to develop, test, prototype and scale nanotechnology solutions. Their work includes surface functionalisation and the integration of smart features into materials, through cuttingedge, printed-electronics technologies.

For example, in Portugal, CeNTI stands out among European research and



Sérgio, António and David

development providers, by mastering the functionalisation and smartisation of diverse substrates. These include textiles, polymers, leather, paper, glass, ceramics, natural stone, concrete, cork and wood. These efforts are crucial for key industries in Portugal.

CENTI – ACHIEVING GROUND BREAKING RESULTS

CeNTI's mission is defined by its dynamic engagement with industrial sectors, both

nationally and internationally. It drives the development and validation of new technologies through innovative materials, coatings, interactive technologies – such as advanced lighting systems – and sensor systems.

The centre's activities focus on automotive and aeronautics, construction, architecture and smart buildings, health, protection and well-being, and energy storage systems.



CeNTI New Lab Centre



CeNTI SCREEN LAB 2024

As highlighted by António Braz Costa, CEO of CeNTI, the centre's projects and solutions emphasise efficiency, a circular economy, sustainability and digital transformation.

FOUNDATION FOR INNOVATION

CITEVE started with expertise in screen printing (both flat and rotary). Since its foundation in screen printing, CeNTI has evolved to integrate digital printing and hybrid solutions for industrial applications. Today, it is recognised as a leader in smart and functional textiles innovation in Portugal.

"Screen-printing technology is increasingly vital to the printed-electronics industry"

Recognising the growing importance of screen printing, CeNTI has invested in modern facilities, establishing a state-of-the-art SCREEN LAB. This lab combines innovation and automation, with advanced technologies. The StencilMaster STM computer-to-screen



CeNTI Lab – THIEME LAB 1000

(CtS) technology delivers high-resolution imaging with 2,400dpi, ensuring exceptional precision and detail. It utilises the latest LED_Q4 multi-wavelength technology (365– 405nm), developed by SignTronic AG, and offers unparalleled pixel accuracy, directly transferring 10µ pixels to the screen.

Additionally, the THIEME LAB 1000 screen printer features high precision, automatic screen and substrate alignment, and is equipped with CCD cameras for superior accuracy.

This advanced technology allows CeNTI to achieve groundbreaking results in printed electronics, including sensors, electronic systems and other functional applications, with unmatched resolution and quality.

ESSENTIAL ASPECTS

Screen-printing technology is increasingly vital to the printed-electronics industry, especially for advanced functional applications. Screen printing works with a wide range of materials, including conductive and dielectric inks and ensures precise control over ink-paste layers.



STM High Resolution CtS

In addition, it can be easily scaled – supporting both small-scale prototyping and large-scale production. Screen printing also delivers precise thickness and sharpness which are crucial for electronic device performance. Finally, screen printing is a cost-effective process, with positive return on investment (ROI), particularly for large quantities.

CONCLUSION

Through collaboration and practical application, the role of screen printing in printed electronics has been shown to be indispensable. In this area of industry, the many advantages of screen printing place it as the optimum application for the future.

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