A Breakthrough High Speed Wide Format Print Concept for Textiles

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Abstract

Digital printing has been around in the industry for many years but is still contributes a relatively small volume of printed substrates compared to analogue printing, especially in the textile industry. With the introduction of new industrial inkjet printing technologies and processes, and with recent advances in nano-technology and in understanding the interaction between inks, print heads and substrates, inkjet technology will gradually move into new areas of application beyond graphics printing and into functional printing, material deposition and additive manufacturing. Functional printing and material deposition for textiles have been demonstrated in the laboratory as proofs of concept or prototypes and will see a breakthrough into the industrial environment in the coming decade. However graphics printing is breaking into the industrial market right now in niche applications and replacing analogue processes.

A significant breakthrough for industrial inkjet printing and functional printing in the textile industry, that is currently dominated by analogue technologies, depends on the availability of reliable and scalable industrial inkjet printing systems and processes with competitive costs per printed area and the availability of industrial inks and finishes at prices that allow high productivity at a competitive cost per printed area compared to screen printing.

This paper will focus on the recent results of development projects involving TenCate, Xennia and Reggiani where great advances have been made in the development of novel inkjet processes and technologies, enabling the use of inkjet printing in textile finishing processes, especially in the area of wide format printing and coating applications.

The breakthrough development is a novel and patented industrial print concept where both the substrate and the print head carriages move continuously without a step and scan phase, leading to a continuous diagonal bi-directional print process with significantly higher throughput than traditional step and scan systems. The concept is scalable for width and speed width and enables web speeds up to 20m/min. The diagonal build-up of the image leads to high reliability and built in nozzle redundancy. The basics behind the continuous print process can be transferred to other wide format print applications beyond the textile industry.

Next to the novel bi-directional continuous print technology other technologies will be reviewed that enable a breakthrough in the wide format printing and functional printing market. With recent developments in the area of textile finishing technologies based on digital printing (coating, dyeing and functional finishes) and with new inks and functional materials for digital textile printing it is expected that in the coming years digital printing will be able to replace analogue processes in textile printing, textile finishing and textile coating but also conquer new niche markets and industrial applications.

Author Biography

Kasper Nossent graduated from the Saxion Hogeschool as a Chemical Engineer (Bsc) and received his Msc. in Innovation Management from the University of Utrecht. In 2006 he joined the digital print industry through TenCate as a project manager where he worked in the area of ink jet technology and textile finishing. In 2010 he joined Xennia Technology in the UK, a TenCate subsidiary and works there as R&D Sales Manager for the commercial R&D business.