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Towards the Print Excellency via Ink –Media Interactions Ideation

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The inkjet technology fuels the rapidly evolving world of printing. This printing technology delivers good print quality using the flexibility of digital printing at a breakthrough cost price. The R&D department of Canon Production Printing company, is a major player in the development of inkjet technologies for many different applications.

The physical processes which regulate the interactions between a sessile droplet and a thin porous paper have been the subject of many studies in the last decades. Both theoretical understanding and sustainable industrial applications are the driving forces for these studies.

Liquid spreading, evaporation and imbibition into porous material are physical processes that describe the interactions of aqueous ink with paper. Understanding them is vital for having prints of high quality; and this is the aim of this work. The influence of the liquid ink physical properties as well as of the paper characteristics are considered. Experimental studies based on Optical Spectroscopy & Microscopy, Scanning Electron Microscopy (SEM), Nuclear Magnetic Resonance (NMR), Electrical Impedance Spectroscopy (EIS), High Speed Camera Recordings (HSCR) and Automatic Scanning Absorptometer (ASA), are presented revealing the three main physical phenomena that dictates droplet dynamics: spreading, evaporation and absorption. Theoretical models and results of computational simulations are strengthening the analysis of the experimental results. Besides the liquid part, the investigated complex fluids contain particles (pigment and colloidal polymeric latex). The result of drying process is an ink solid thin film formed onto porous paper with optical and mechanical properties. Targeting the print excellency, this work provides an extensive overview of the methods to investigating the interaction between ink and paper, highlighting their strengths and limitations.

Participation

In-Person

References

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Energy Transition Focused Abstracts

Primary author: Dr TOMOZEIU, Nicolae (Canon Production Printing B.V.)

Presenter: Dr TOMOZEIU, Nicolae (Canon Production Printing B.V.)

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