Lasersonic-LIFT Process for Large Area Digital Printing

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The currently used digital printing methods e.g. Inkjet or Xerography are very costly on an industrial scale, because they use expensive consumables, specific inks and specially-coated substrates for the printing process. The laser-induced forward transfer of inks from a donor ribbon or roller to substrates allows for the use of inexpensive inks and paper as they are commonly used in today's industrial rotogravure or offset printing. The challenge of this approach is to develop a fast direct laser writing unit which can cover an area of more than 1 m2/min with a screen resolution of 300 dpi to 600 dpi and which allows for high laser spot pointing accuracy and for a fine (8 bit) reproduction of each grey tone value. Due to the large area and the desired high printing speed, the laser power (mean) needs to be within a range of a few hundred Watts. At 20 to 25 MHz modulation rate of the high power laser beam and at a laser spot scanning speed of 800 to 2116 m/s over a scan field length of 530 mm, we demonstrated reproducible printing of commonly used, water-based environment-friendly and inexpensive inks.