

Twenty Years of Ink Jet Domestication

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Abstract

The introduction by Hewlett Packard of the ThinkJet printer in 1984 marked a turning point in ink jet printing. A technology which had been primarily implemented in industrial applications embarked upon a developmental course that ushered in consumer digital photography via unheard of low prices for a desktop printer capable of photographic image quality. In this sense the complexity of ink jet printing was domesticated, bringing it onto the desktop and into the home with simplicity of operation, maintenance and user interface. Complementing the extension into consumer applications, professional photographers and commercial printers have found ever expanding applications for the large and ultra-large format ink jet implementations. Today, the installed base of ink jet printers is in the hundreds of millions. These numbers have not arisen simply from a predictable improvement in the performance parameters such as resolution, drop volume and operating frequency. Parallel innovations in ink, colorants (both dyes and pigments), specialty substrates, digital halftone algorithms and colorimetrically based color reproduction methods have acted as technology "forces" to guide the evolution of ink jet printing. The ever increasing computational power of PCs coupled with plunging memory costs has added "fuel to the fire" as it were, energizing a digital imaging revolution that has centered, to a great deal, on ink jet printing.

Given this remarkable history some obvious questions occur, many centering around the future of ink jet. Some of

these relate to the ability of ink jet to compete with other printing technologies such as laser electrophotography, dye sublimation, even offset lithography. This approach leads to a performance specification analysis: resolution, dry time, drop volume, grayscale capability, waterfastness, operating frequency, lightfastness, color gamut etc., and the list is yet quite incomplete. Another approach is to examine the future directions for the printing applications, such as digital photography, where ink jet printers are very popular, and seek to ascertain how ink jet can supply the changing demands of those markets. The author will seek to blend both of these approaches as a way of looking to the future.

Finally, the insights and lessons derived from taking a nascent idea and following its development from a very modest 96 dpi printer all the way into the photographic imaging technology of today's ink jets are of value to all who seek to invent. A selection of observations, lessons and some humorous stories will be offered for potential inventors.

Biography

Dr. Meyer holds a PhD in experimental low-temperature physics from the Univ. of Southern California. He is a past president of the Society for Imaging Science and Technology. Dr. Meyer is also a member of the Faculty Advisory Board for the Center for Imaging Science, Rochester Institute of Technology.