

## Inkjet and digital printing



Self Portrait - Japanese Style  
Natalia Lamanova  
A large version of this image  
(100cm x 110cm) was printed at  
CFPR, UWE, Bristol, UK in July 2005  
for the exhibition "What is Big?"

The notes below have been supplied by Professor Steven Hoskins of the Centre for Fine Print Research at the University of the West of England, Bristol. [www.uwe.ac.uk/amd/cfpr](http://www.uwe.ac.uk/amd/cfpr)

Digital Technology currently dominates not only the commercial print world, but has also made major inroads by influencing printmakers who use new technology. This technology is actually not quite as new as we might believe. Chester Carlson invented xerography or electrostatic printing, the technology for laser printers and photocopiers, as early as 1938 and in 1969

AB Dick introduced the first commercial ink jet printer. It is these two technologies **Electrostatic** and **Ink Jet** that form the bulk of current digital printing along with the laser light photographic process **Durst Lambda** and **Dye sublimation** taking a minor role. Artists have adopted these technologies and particularly **wide format ink jet** because they can print large scale imagery created by computer. Do not be confused however that a good quality original print can be created just by the touch of a button. Many high quality digital prints can take long periods of time to create and if printed with care and understanding the range of subtlety and colour available photographically, is very different to any other printmaking medium.

### Digital Printing

**Electrostatic** is the technology that drives photocopiers and laser printers. It works on an electrically charged cylinder that attracts dry powder toner onto a metal drum. The powder is transferred to a sheet of paper and heat-sealed in place. This technology is currently used very little by artists but at the end of the Nineteen Eighties there was a trend to produce photocopy artworks.

**Lambda** prints are essentially the same as a photograph they use conventional photography papers and development, but are created by digitally driven laser light sources to expose the photographic paper.

**Dye Sublimation** printers create colour on the printed page by vaporizing inks, which then solidify (or "sublimate") on the page. The ink combines into a smoothly mixed colour dot. These printers use a sheet of dye or a solid ink from which the colour is transferred.

There are two categories of **inkjet printing—continuous and drop-on-demand**, these relate to the types of print head used and within drop on demand there are two common types of print head, thermal and piezo. It is this technology that is sometimes referred to as **Giclee**. This simply translated is the French word for spurt and has been used confusingly to try and differentiate the process from its origins

**Continuous inkjet** printers generate a steady stream of ink, deflecting drops electronically onto the printing medium. The process uses inks that have strong surface tension to avoid splashing of the ink dots and the development of minute satellite droplets, which influence the shape of each printed droplet. However this variation and subtle surface visually creating an almost continuous tone appearance was the very characteristic that first drew artists to inkjet printing, with the **Iris** printer from Scitex. Its huge cost and troublesome maintenance inhibited the initial growth of wide format inkjet for artists.

Introduced in the late 1990's **Drop-on-demand inkjet printers** are the primary means for creating artists prints. Essentially the same technology as a desktop ink jet printer on a very large scale. They can print images up to 60 inches wide and many feet in length. The inks tend to be water based, and for the artist the weakness of these systems originally was their use of dye-based inks, which were very fugitive. This problem has been greatly improved with the introduction of pigment ink sets, also known as UV and given the right ink and paper combination, the light resistance to fading of digital inkjet, is now similar to if not better than, lithographic and screen-print inks

**Thermal inkjet** printers use heat to generate vapour bubbles, ejecting small drops of ink through nozzles and placing them on a surface to form text or images. It has fast operation and good colour resolution. Originally developed for desktop printers, the disadvantage is that the heads need to be replaced more frequently than piezo.

**Piezoelectric** printing technology—commonly called piezo—pumps ink through nozzles using pressure. The print head regulates the ink by means of an electrical current passed through a material that swells to force ink onto the paper. Piezo print speeds are slower.

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