DIGITAL TEXTILE PRINTING

DIGITAL PRINTING ON TEXTILE

Digital textile printers function very much like inkjet printers, but instead of paper, the dye is printed on fabric with textile dyes. Unlike printing paste in screen printing, inks of textile printers do not contain any thickening or fixing agents, but they consist of pure colouring matter. Auxliaries are applied to the fabric as a pre-treatment prior to printing.

Aoi Yoshizawa: Sumire for Svensson

THE PRINTING PROCESS

- Digital printers can be used with reactive dyes, pigment dyes, disperse dyes and acid dyes

- When printing with reactive, disperse and acid dyes, pre-treatment of fabric with proper auxiliaries is required

- For example, when printing with reactive dyes on cellulose, the similar auxliaries are needed as in screen printing with reactive dyes on cellulose

- Fixation and post-dye washes are also made similarly as in other reactive dye processes (screen printing, exhaust dyeing, painting)

- Pigment dyes can be printed directly on almost any fabric, and no pre-treatment of fabric is needed


Digitally printed carpet, Kasthall

DIGITAL TEXTILE PRINTING FROM THE DESIGNER´S POINT OF VIEW

The digital textile printer might be operated with only four main colours (cyan, magenta, yellow and black) or additional colours (blue, orange, red, green, grey) could be added. These dyes are not mixed together like in traditional printing paste, but printed as pure colourants. Different shades in the design result from optical mixing of the dye droplets.

From the designer's point of view the process is relatively easy: no colour separation is needed. From the print technician's point of view the process is more demanding, as typically an own colour and printing profile is needed for each base material. Color management is indeed one of the biggest challences in digital printing, and the colours do not always come out as desired. Printing a test print before the final one is an advisable practise.

There are several factors determining the quality of end result in digital textile printing, for example the colour profile settings, the colorants, the base fabric and the finishing. Similar to traditional printing, fine details are easier to achieve when printing on fine and smooth fabric like satin, than on a coarse material. On the contrary to screen printing, large, uniform colour surfaces may be challenging to print digitally. Also some colours can be more challenging than others.
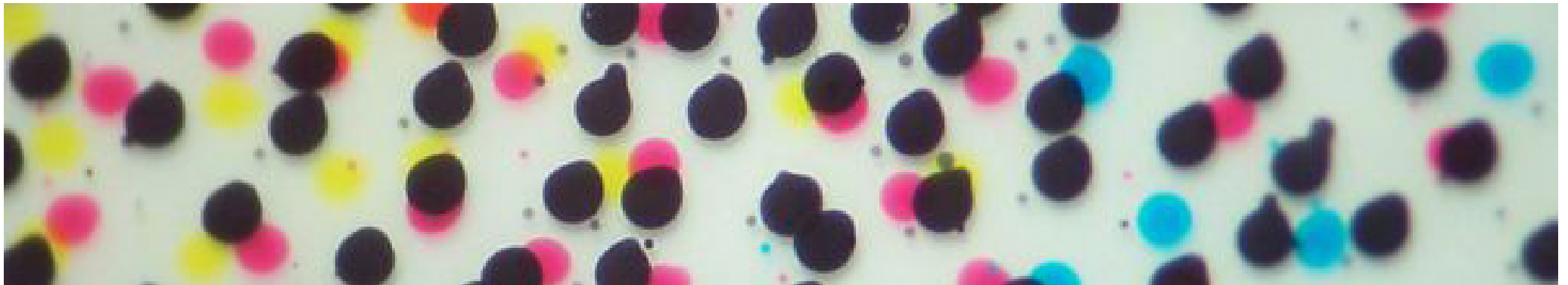
Highly magnified view of colour inkjet print - photo www.micrographia.com

ENVIRONMENTAL ASPECTS

- By using only the exact amount of dye needeed to create the desired pattern on fabric, digital printing in most cases uses less water, dye and auxiliaries than screen printing

Woodhead Publishing Series in Textiles: Number 126: Textiles and Fashion - Materials, Design and Technology, Edited by Rose Sinclair, 20.2.6 Digital inkjet printing
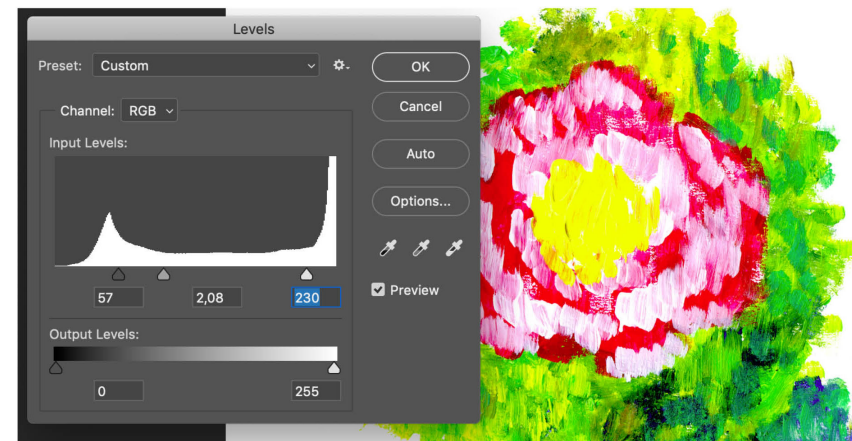
Eeva Heikkinen: Digital printing on texiles in the book Contemporary Colour Methods by Maija Pellonpää-Forss

Thomas Bechtold, Tung Pham: Textile Chemistry, 2019, Walter de Gruyter GmbH, Berlin/Bosto

MAKING THE FILE FOR DIGITAL PRINTING IN PHOTOSHOP

As no colour separation is needed, and even repeat is not always necessary, a designer can use pretty much any tools in Photoshop to work with the design, to adjust it's colours and composition. However, some matters should be taken into account:

- It is advisable to do all of the image processing in same colour managed environment. Before opening your design in Photoshop, change colour settings in **Edit -> Color Settings**, change Settings to **Europe Prepress**. (RGB: Adobe RGB)

- As even a fine fabric is coarser surface than a smooth paper, and dye droplets spread when printed on fabric, very fine detailes are not possible to print succesfully - using high resolution in the file would not help in this. Usually **90-180 dpi** is advisable.

- The spreading of droplets could also result in too dark and dull designs, and to avoid this, the darker mid tones of the design could be lightened. Do **Image -> Adjust -> Levels** and drag the grey slider onto left.

- In general, increasing contrast of the design a bit might be useful

Eeva Heikkinen: Digital printing on texiles
in the book Contemporary Colour Methods by Maija Pellonpää-Forss

CHANGING COLORS IN MULTICOLORED IMAGE

Here are presented some tools you might use when adjusting colours of your print. Note, that some suite better for just tuning the colours into right direction, while some others can be used to completely change the colours. There are many possibilities in Photoshop to adjust colors of a multicolored image. Some tools work better for some designs, so try different tools if you are not happy with first!

When making the color changes in **Adjustment Layers**, the original coloring is kept safe. In Adjustment layer, colors can be changed from the entire design, or from a selection.

Try: **Layer –> New Adjustment layer –> Selective Color.** This is maybe the most versatile of all Adjustment color tools. In Selective Color window, select first the tonal range you want to modify (yellows or neutrals for example) and blend the color by decreasing or increasing the amount of cyan, magenta, yellow or black in it. Relative creates more subtle adjustments than Absolute, so try them both.
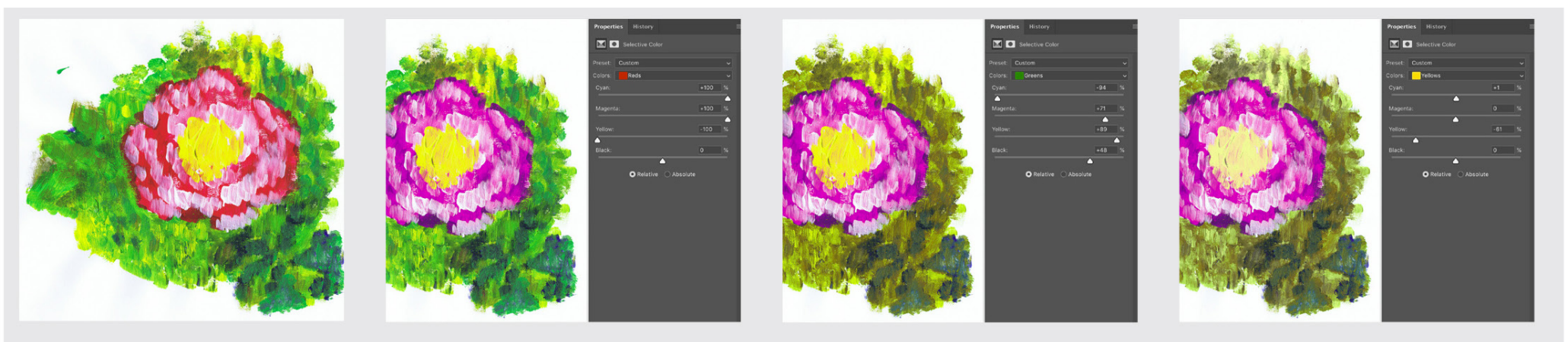
OR: **Layer –> New Adjustment layer –> Hue/Saturation**. Adjust Hue, Saturation and/or Lightness in Adjustment window to change the colors. You can adjust all the colors in design, or e.g. only blue or magenta tones.
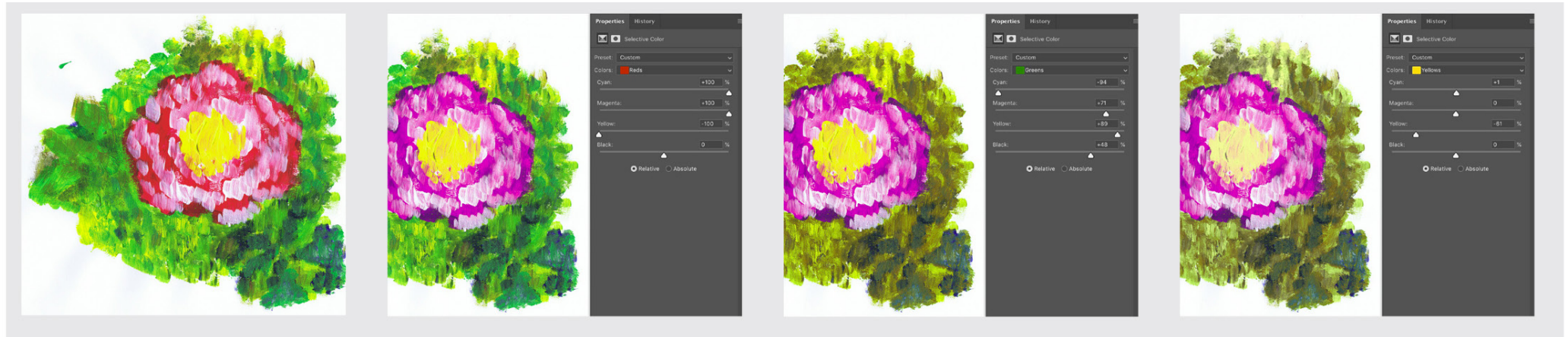
Replace Color is a suitable tool for tuning the colors into exactly right tones. It does not suite well for changing the colors completely. Replace color cannot be found in Adjustment layers list and you will need to merge Adjustment layers used before using Replace Color. To not make changes directly in the original image, you might make a new layer copy before using this tool.

In **Image –> Adjustment –> Replace Color** select first the color range to be modified. Add more tones in selection with Add to sample Eye dropper (+). Increase Fuzziness to expand selection. To change the selected tones into the exactly right tone, click Result-swatch.