

A PRESSING MATTER

Maaik de Jong examines the process of using heat press calenders for dye sublimation transfer printing, and offers advice on choosing the correct machine to suit your textile production needs

Sublimation is the transition of a solid product into gas. During dye sublimation the solid dye (ink) evaporates by heat; the ink does not become liquid, but changes immediately into gas. In this way, the dye particles penetrate the substrate immediately.

The dye sublimation process consists of two steps:

1. Graphics are printed onto transfer paper using sublimation inks;
2. The printed graphics are transferred from the paper to the polyester substrate, using a heat press.

This technique is commonly used for fashion and sportswear, signs and banners as well as other items with sublimation-friendly surfaces such as polyester (PES).

DIRECT VS TRANSFER PRINTING

To cater for a variety of printing methods, Dutch manufacturer of industrial rotary thermoprocessing equipment, Klieverik offers heat press calenders for both direct printing (fixation) and transfer printing.

Direct printing means that the ink/pigments are printed straight on the material/substrate. A special coating on the substrate is needed for good deposition of the ink. To create flags, for example, you aim to have a good quality and similar colour on both sides; therefore, a high ink load is needed. Sharp contours of the print, low ink consumption, no need for coating on the fabric and a 100% dye fixation are

typical advantages of the direct printing/fixation process.

Transfer printing means there is an intermediate step and material involved: the transfer paper. The design is printed on the paper and by the use of the sublimation process, the particles are transferred

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onto the polyester substrate. A benefit of transfer printing over direct printing is that it is even possible to print stretchy materials like jersey fabrics for sportswear.

CHOOSING THE RIGHT MACHINE SIZE

The size of the printer and calender you require will be determined by the product you would like to create. There is a range of working widths available in the market, from 1650mm or 1800mm (typically fashion), to 3200mm and even 5000mm width, mostly used for the signage market.

Furthermore, the drum size is important: the larger the drum, the higher the output you can achieve. Of course you can adjust temperature, dwell time and pressure, depending on the result you are after.

THE IMPORTANCE OF CONSTANT HEATING

An important factor in the process is the temperature, which should be constant throughout the process – the width as well as the production run. The drum of a Klieverik calender will always be completely filled with thermal oil. The heating elements are evenly distributed throughout the drum to ensure a perfectly controlled temperature.

ON-DEMAND PRINTING

The future of apparel manufacturing is on-demand production. In the traditional method a large amount of the same items are produced, which often results in many unsold items that are then destroyed. This is bad for the environment and it is a waste of a company's resources. Producing smaller amounts for (still) affordable prices avoids these risks. The garment will be ordered and paid for in advance, and will be produced on-demand. The environmental footprint is smaller; there are no minimums; you could easily change your collection and you don't need a large inventory.

A MICRO-FACTORY WOULD CONSIST OF:

- Design: the designs are created on a computer, using special software.
- Printing: the designs are sent to a printer and printed onto transfer paper using sublimation inks.
- Transfer Printing on a calender: the design is transferred to the substrate by means



Designed as an entry-level machine, Klieverik's Vertex hybrid transfer calender offers single-piece transfer and roll-to-roll printing

of dye sublimation transfer printing on a heat press calender.

- Cutting: a cutting machine will cut the fabric into the right forms and sizes.
- Sewing/Stitching: using a stitching / sewing machine, you can assemble the final product.

ROLL-TO-ROLL VS SINGLE PIECE PRINTING

If you need a larger volume (roll) of textile to be printed, you use a roll-to-roll machine. In this case you enter rolls of printed material and rolls of textile into the calender, so the print is transferred from one roll onto the other.

If you want to print smaller, individual objects, such as sports shirts, mouse pads, face masks, etc., a single-piece machine is the preferred option. It is equipped with a table on which you can place the cut materials on the printed paper, after which the print in the calender is transferred to the material. The printed materials then fall into the bin behind the machine. If you want to increase the speed, a longer table and a large drum diameter is the solution.

If you require both processes, a hybrid machine provides a solution. This can be typically be done on the single pieces' execution with added roll-to-roll capacity. An entry-level machine is especially attractive for smaller or starting companies.

VERSATILITY OF THE VERTEX

The Vertex was designed by Klieverik as an entry-level machine for efficient single-piece transfer printing. But the calender is also able to print from roll to roll. It also offers precise edge definition from a compact design with an oil-filled heating drum.

The machine has been optimised for easy operation and is suitable for all types of PES textiles such as sports shirts, masks, mouse pads and much more. Blanks are placed on the feed table and continuously transported with the printed paper to the front of the calender. From here printed pieces can be removed from a box below.

It is also possible to use the Vertex to make a transfer print on roll goods, or for the fixation of directly printed textiles. With a working width of 1650mm, it virtually covers the usual commercial formats of textiles and paper. The 200mm diameter heating roller is ideally suited for a print shop offering a wide range of articles it would like to produce on site.

The tension for both paper and textiles is adjusted with the help of air pressure. A compact touchscreen panel enables easy control. The control also monitors the operating hours and indicates when the next maintenance work is due to avoid unpleasant surprises and high costs. This modern control system is also prepared for remote monitoring and diagnostics – certainly a novelty for a machine in this class. Using a communication module the Vertex can inform the owner and Klieverik Service via the internet that a technical incident has occurred and advise on what needs to be done next. This K-connect service module will soon be available for all Klieverik calenders.

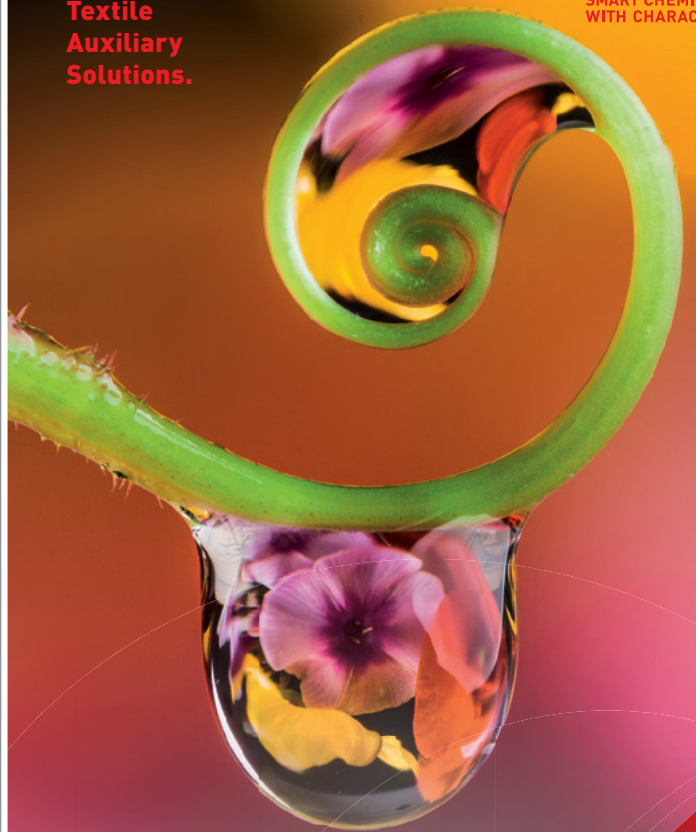
The Vertex is a typical Klieverik machine: a robust construction that offers a long service life with low operating costs and an effective oil-based heating system for very high temperature resistance. Its size and capacity are ideal for print shops that want to take charge of their own production without compromising on quality.

At the same time, the machine is future-proof because it is equipped with a modern control system and enables a connection to the Internet. ■

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